Category Analysis Regulatory Information Notice

Basis of Preparation

2018/19

October 2019

This page has been left intentionally blank.

Glossary of Terms

AER	Australian Energy Regulator
BOM	Bureau of Meteorology
CT	Current Transformer
DNSP	Distribution Network Service Provider
FTE	Full time equivalent
GIS	Gas Insulated Switchgear
GWh	Gigawatt hours
HR	Human Resources
kV	kilovolt
MD	Maximum Demand
MDP	Meter Data Provider
MVA	Mega volt ampere
MVAr	Megavar
MW	Megawatt
NCC	Normal Cyclic Capacity
NEM	National Electricity Market
ODAF	Oil directed air forced
ODAN	Oil directed air natural
ONAF	Oil natural air filled
ONAN	Oil natural air natural
OPGW	Optical Ground Wire
OSTRAC	Powerlink's outage management system
POE	Probability of Exceedence
RIN	Category Analysis RIN issued by the AER, 7 March 2014
SAP	Powerlink's corporate enterprise resource planning database
SCADA	Supervisory Control and Data Acquisition
SVC	Static Var Compensator
TAPR	Transmission Annual Planning Report
TNDB	Transmission Network Database
VT	Voltage Transformer

This page has been left intentionally blank

Overarching Comments

For clarification, Powerlink has adopted the following general approaches in a number of tables across the Category Analysis RIN templates. Where relevant, these have generally been identified in the Basis of Preparation for the specific sheet and/or table.

Regulatory Financial Statements

Where applicable, all costs have been reconciled to Powerlink's Regulatory Financial Statements.

Actual and Estimated Data

Where the preparation of data met the AER's definition of actual information, this data has been identified as actual.

All data which did not meet the AER's definition of actual information has been identified as estimated. This includes information whose presentation *is materially dependen*t on historical accounting or other business records and *is contingent* on judgments, assumptions, allocation methodologies or other adjustments for the purposes of responding to the Category Analysis RIN.

Where data has been estimated, Powerlink considers these to be its best estimates in the context of the RIN requirements.

Capital Project Information

The AER's Information Guidelines (which relate to preparation of the Regulatory Financial Statements) require that individual capital projects be categorised in total according to the primary reason for investment. For example, the primary reason or driver for a capital project may have been replacement due to age, condition or obsolescence. However, this project may also contain some minor augmentation components. The entire project has been categorised as replacement.

Process to Unburden Corporate Overheads from Costs

The Category Analysis RIN requires that all capex and opex costs reported in the templates exclude (or unburden) allocated overheads[1]. Powerlink allocates overheads using its AER approved Cost Allocation Methodology as published on Powerlink's website. To unburden capex and opex costs, Powerlink derived a corporate overhead rate from the employee activity rate when applied to the time charged to activities. Further details about the process are provided in the methodology section in relation to Table 2.2.1 (Repex) of the Basis of Preparation, and are noted in other areas throughout the document where relevant.

Real and Nominal Conversions

Given that the RIN requires current year data, conversions are not required.

[1] Category Analysis RIN, pp39-40.

Sheet: 2.1 Expenditure Summary

Table: 2.1 Cost summary and reconciliation

RIN requirements

This section has been completed in accordance with Appendix E (sections 1, 2 and 3) and Appendix F of the Category Analysis RIN.

Table 2.1.1 has been populated with estimated data. The reasons why estimates were required and how they were produced are explained in the relevant sections of the Basis of Preparation.

Source

The data has been sourced from sheets 2.2 (Repex) to 2.10 (Overheads), Powerlink's Regulatory Financial Statements and Powerlink's financial systems.

Methodology and assumptions

In accordance with the Category Analysis RIN, Powerlink has reconciled the Total Capex and Opex expenditure for each service classification in Tables 2.1.1 to 2.1.2 to the total expenditure reported in sheets 2.2 to 2.10 (refer attached Reconciliation Tables in Appendix A).

The balancing items used to reconcile the expenditure are as follows:

Corporate Overhead*:* as expenditure reported in sheets 2.2 (Repex) to 2.8 (Maintenance) must be direct cost only Powerlink has removed Corporate Overhead Expenditure using the methodology to unburden corporate overheads (including procurement overheads) from the cost data using the processes described in section 2.2.1 of the Basis of Preparation.

Capex

- **Post commissioning costs*:*** consistent with Accounting Standards, Powerlink defines "project close" as the year in which the asset is ready for use, i.e. the year in which the asset was capitalised. As a result, any post commissioning costs have not been reported as part of the project costs reported in sheets 2.2 (Repex) to 2.6 (Non-Network). These post commissioning costs have therefore been included in this balancing item;
- **As incurred*:*** as capex and associated data reported in sheets 2.2 (Repex) to 2.6 must be reported against the Regulatory Year on a "project close" basis and Table 2.1.1 must be reported on an "as-incurred" basis, this balancing item reconciles the timing difference between "as-incurred" capex and "project close" capex for Category Analysis RIN purposes;
- **CAPEX not reported in the RIN*:*** certain easements[2], security/compliance and other projects that did not meet the Category Analysis RIN definitions are not reported elsewhere in the sheets 2.2 to 2.6, and are included as a balancing item for the purposes of reconciling to the Regulatory Financial Statements.

[2] This only includes easements where there is no associated augex project.

Sheet: 2.2 Repex

Table: 2.2.1 Replacement Expenditure, Volumes and Asset Failures by Asset Category

RIN requirements

This section has been completed in accordance with Appendix E (sections 1, 3 and 5) and Appendix F of the Category Analysis RIN.

Table 2.2.1 has been populated with both actual and estimated data. Actual data has been used for asset replacement and failure volumes. All financial data has been estimated.

Consistent with the RIN[3], Powerlink has added the following asset groups to Table 2.2.1:

- Buildings – which include control and communication buildings; and
- Site Infrastructure – which include all roads, drainage, lighting, fences, AC and DC supply systems and amenities buildings.

Source

Financial data has been sourced from Powerlink's Regulatory Financial Statements and Powerlink's corporate enterprise resource planning database (SAP) Project System Module and capitalisation data.

For each project, Powerlink's internal Project Scope documents were used to provide the high level technical scope of the project and to identify some of the technical asset information required in the templates.

Historical transmission asset outage data from Powerlink's internal network operating systems was used to source the number of asset failures per annum. Powerlink's corporate enterprise resource planning database (SAP) Plant Maintenance Module was used to source asset details for categorisation of asset replacements and asset failures.

Powerlink has sourced ratings data from its internal Transmission Network Ratings Database.

[3] Category Analysis RIN, Appendix E, 5.1(c)

Methodology and assumptions

Financial Data

Consistent with Accounting Standards, Powerlink defines 'project close' as the year in which the asset is ready for use, ie. year in which the asset was capitalised. As a result, any post commissioning costs have not been reported as part of the project costs. These costs have been included as a balancing item in Table 2.1.1 of sheet 2.1 Cost Summary and Reconciliation of the templates.

Removal of Corporate Overhead Expenditure

The RIN[4] requires that direct capex and opex costs reported in the templates exclude any allocated overhead. Powerlink allocates overheads using its AER approved Cost Allocation Methodology as published on Powerlink's web site.

Corporate Overhead

Powerlink has enhanced its financial systems capability to allow for greater visibility of corporate overhead expenditure at the activity level. Powerlink's corporate overhead expenditure continues to be allocated on a *Labour Time Charged* basis.

To comply with the requirements of the RIN, where the corporate overhead expenditure cannot be directly attributed to an activity, Powerlink derived an indicative corporate overhead rate which enabled the unburdening (or exclusion) of the corporate overhead from the employee activity rate when applied to the *Labour Time Charged* to activities. To derive the indicative rate Powerlink:

1. Identified the value of corporate overhead expenditure that was allocated to the labour activity charge in the RIN reporting year.
2. This value was then divided by the total costs allocated to activities on a *Labour Time Charged* basis.
3. The resulting percentage (the Burdened Percentage) represents an average corporate overhead charged to activities on a *Labour Time Charged* basis.

To unburden the corporate overheads the derived Burdened Percentage was applied to total expenditure via the *Labour Time Charged* method to each activity.

Procurement Overhead

Costs associated with Powerlink's procurement function were separately identified and allocated as an on-cost to external purchases for goods and services. To comply with the requirements of the RIN[5], where the procurement overhead cannot be directly attributed to an activity, Powerlink removed these costs using a pro-rata rate adjustment to the non-labour cost components costed to each activity.

[4] Category Analysis RIN, definition of direct costs, p39.
[5] Category Analysis RIN, p39-40.

Estimated Costs

Why estimates are required

Where Powerlink's asset categories were similar to the AER's RIN categories (ie. cables, transformers, reactive plant and SCADA, Communication and Protection Systems), the capitalised value of the asset, inclusive of procurement, design and installation was initially identified. However, given that the RIN requires that corporate overheads (including procurement overheads) be excluded from all reported costs and, Powerlink has derived and applied a methodology for unburdening overheads, all reported costs are considered to be estimates.

Further, Powerlink's systems do not record asset expenditure information to the category required by the AER for the following equipment types:

- Transmission Towers;
- Conductors;
- OPGW;
- Circuit breakers;
- Isolator/earth switches;
- Voltage Transformers (VTs); and
- Current Transformers (CTs).

For the categories identified above, Powerlink has estimated values for these equipment types based on a proportion of the high level asset value capitalised to each project (more information below).

How the estimate has been produced

To estimate the **towers/conductor/OPGW** expenditure for each project, Powerlink applied the following approach:

1. Used project specific records to identify procurement costs for towers, conductors and OPGW, pro-rated common costs and developed a percentage for each category.
2. Estimated the tower, conductor and OPGW costs for each project to populate the templates by applying the relevant category percentage to the total capitalised value recorded in Powerlink's financial systems.

To estimate the **circuit breakers, isolator/earth switches, VT's and CT's** expenditure for each project, Powerlink applied the following approach:

1. Identified two general types of switching bay asset – 275kV and 132kV;
2. Developed the circuit breaker (live tank)[6], isolator/earth switch, VT and CT cost to total cost proportion for each of these two general types of projects from Powerlink's estimating system; and
3. Estimated the equipment costs for each project to populate the templates by applying the relevant percentage to the total switching bay value recorded in Powerlink's financial systems.
4. Decommissioning / dismantling / disposal costs are included in these estimates.

[6] Where Powerlink has installed circuit breakers of a dead tank design (ie. CT integrated) the CB and CT proportions are added together.

'Other' Asset Category

Powerlink has included assets and equipment in the "Other" category. Expenditure in this category includes:

- expenditure that relates to replacement of a sub-component of an asset;
- expenditure that relates to increasing the functionality of the asset;
- expenditure that relates to the relocation of an asset; and
- assets not separately reported.

Technical Data

Asset Replacements

Powerlink adopted the following approach to the preparation of specific technical data:

1. The number of assets replaced has been sourced from Powerlink's SAP Project System/Plant Maintenance System and individual project scope documents.
2. The number of towers replaced also includes poles if poles are also replaced.
3. The number of Circuit Breakers and Isolators/earth switches are counted as 1 for each 3-phase set.
4. The number of VT's and CT's are counted as 3 for each 3-phase set.
5. The rating value identified is the summer normal rating and has been sourced from Powerlink's ratings database. Ratings have been estimated.

Ratings Information

Why estimates are required

Equipment ratings are calculated using a rating methodology which requires judgments to be made on a number of input assumptions and criteria and choice of methodology which relate to the operation of Powerlink assets. The resulting rating is therefore dependent on the judgments made by Powerlink in regards to rating its assets.

How the estimate has been produced

- The cyclic transformer ratings, *Normal* and *Emergency*, are calculated based on season (summer, winter, shoulder), load profile (site specific), ambient temperature (Southern, Central and Northern) and cooling mode (ONAN, ONAF, ODAN, ODAF).
- Normal cyclic refers to the normal cyclic summer rating. Powerlink identifies 'normal conditions' as per the Australian Standard[7] .

[7] AS 2374.7 -1997, Power Transformers, Part 7: Loading Guide for Oil-Immersed Power Transformers.

Asset Failures

Powerlink adopted the following approach to the preparation of specific technical data:

1. Each replacement capital project record was assessed against the RIN definition for repex asset failures.
2. Where the replacement capital project was as a result of asset failure, the associated record was included in the count for the number of asset failures.
3. Asset group and asset category details of the asset failure were identified, and the number of asset failures for each asset group and asset category has been summated for each financial year.

There is one asset failure identified in 2018-19.

Project Specific Information

2018/19 Explanatory Notes:

Asset Category: Other

As required by the RIN, Powerlink has identified transmission tower refurbishment projects separately within the transmission towers asset group and reported these against the "Other" category. Consistent with Powerlink's capitalisation policy and Final Determination, refurbishment information contained in this table reflects life extensions only (defined by the AER as line refits in Powerlink's Final Determination (2012)).

Asset Category: > 66 kV & < = 132 kV ; CONDUCTOR > 100 MVA & < = 400 MVA
Asset Category: > 66 kV & < = 132 kV ; AIR INSULATED CIRCUIT BREAKER
Asset Category: > 66 kV & < = 132 kV ; AIR INSULATED ISOLATORS/EARTH
Asset Category: > 66 kV & < = 132 kV ; CT
Asset Category: > 132 kV & < = 275 kV ; VT

The costs in these categories relate to complex projects that required engagement with multiple stakeholders.

Table: 2.2.2 Selected Asset Characteristics

RIN requirements

This section has been completed in accordance with Appendix E (sections 1, 3 and 5) and Appendix F of the Category Analysis RIN.

Table 2.2.2 has been populated with actual data.

Source

Table 2.2.2 has been populated by data sourced from Powerlink's corporate enterprise resource planning database (SAP) Project Module, Plant Maintenance data and capitalisation data.

Methodology and assumptions

Conductor asset volumes and asset replacement values are identified by circuit lengths (km).

Sheet: 2.3 Augex Projects

Table: 2.3.1 Augex Asset Data - Substations

Table: 2.3.2 Augex Asset Data - Lines

Table: 2.3.4 Augex Data – Total Expenditure

No augex projects reported for 2018/19.

Sheet: 2.5 Connections Expenditure

Table: 2.5.1 Expenditure of connection projects

Table: 2.5.2 Description of connection projects

No connection projects reported for 2018/19.

Sheet: 2.6 Non-Network Expenditure

Table: 2.6.1 Non-Network Expenditure

RIN requirements

This section has been completed in accordance with Appendix E (sections 1 and 3) and Appendix F of the Category Analysis RIN.

Table 2.6.1 has been populated with estimated data.

Source

The data has been sourced from Powerlink's Regulatory Financial Statements and its Financial Systems.

Methodology and assumptions

Financial Data

Why an estimate is required

Powerlink's financial systems do not record cost information in the form required under the RIN.

How the estimate has been produced

Powerlink has applied judgment in the allocation of expenditure to the categories required by the AER under the RIN.

Expenditure estimates were derived using the methodology to unburden corporate overheads (including procurement overheads) from the cost data using the processes described in relation to Table 2.2.1 (Repex) of the Basis of Preparation.

Project Close Basis

Consistent with Accounting Standards, Powerlink defines 'project close' as the year in which the asset is ready for use, i.e. year in which the asset was capitalised. As a result, any post commissioning costs have not been reported as part of the project costs. These costs have been included as a balancing item in Table 2.1.1 of sheet 2.1 Cost Summary and Reconciliation of the templates.

Capex and Opex Reported on a Whole of Business Basis

Non-network operating expenditure and non-financial metrics have been reported on a whole of business basis. That is values have not been disaggregated and are inclusive of prescribed, negotiated and non-regulated measures.

IT and Communications

Capital expenditure is reported on a Project Close basis and has been allocated between the RIN categories in line with the RIN definitions.

Motor Vehicles

Capital expenditure related to Motor Vehicles was directly allocated to the RIN classification.

The majority of operating expenditure related to Motor Vehicles was directly allocated to the RIN classification. Operating expenditure that could not be directly allocated to the RIN classifications was apportioned across each category in the following manner

> *(Direct Operating Expenditure per Category / Total Direct Operating Expenditure) * Total Indirect Operating Expenditure*

The resulting data is therefore considered to be an estimate.

Building and Property

Powerlink allocated its Property and Buildings data into the RIN classification for both Opex and Capex.

Other

Motor Vehicle Operating and Capital expenditure included in the Other asset category represents expenditure incurred on the following:

- Trailer;
- Work Platforms;
- Forklifts;
- Miscellaneous; and
- All terrain vehicles.

In line with the methodology described in the Motor Vehicle section above, both Operating and Capital expenditure data is considered to be estimates.

Powerlink has nominated an additional Other asset category which includes all remaining tools and equipment expenditure.

Table: 2.6.2 Annual Descriptor metrics – IT & Communications Expenditure

RIN requirements

This section has been completed in accordance with Appendix E (sections 1 and 3) and Appendix F of the Category Analysis RIN.

Table 2.6.2 has been populated with estimated data.

Source

The data has been sourced from Powerlink's Corporate Information systems.

Why an estimate is required

Powerlink's financial systems do not record cost information in the form required under the RIN.

How the estimate has been produced

Powerlink has applied judgment in the allocation of expenditure to the categories required by the AER under the RIN.

Methodology and assumptions

Employee Numbers

Powerlink has derived Average Staffing Level numbers using the methodology required under Template 2.11 to populate this table.

User Numbers

User numbers include Powerlink staff, contract staff and contingent staff.

Powerlink does not retain historic user number statistics and has therefore provided an estimate. The estimate utilises the current ratio of active system users over employee numbers which has then been applied to historic employee numbers provided in the RIN.

Number of Devices

Powerlink has included the following equipment in the Client Device statistics:

- Desktop Computers;
- Laptop Computers;
- Smart Phones;
- Smart Devices; and
- Thin Client devices.

Devices issued to direct Powerlink staff, contractors and contingent staff has been included along with computers used in training facilities, substations and common areas within Powerlink. Those devices which have been decommissioned but are awaiting final disposal have been removed from the final Client Device numbers reported.

Table: 2.6.3 Annual Descriptor metrics – Motor Vehicles

RIN requirements

This section has been completed in accordance with Appendix E (sections 1 and 3) and Appendix F of the Category Analysis RIN.

Table 2.6.3 has been populated with estimated data.

Source

The data has been sourced from Powerlink's Financial Systems and its fleet management service provider.

Methodology and assumptions

Powerlink developed estimates for all motor vehicle descriptor metrics.

Why an estimate is required

Powerlink's systems do not record the vehicle information in the form required under the RIN.

How the estimate has been produced

Powerlink has applied its judgment to develop, apportion or allocate on the bases described below.

Average Kilometres travelled (000's)

Powerlink's motor vehicle fleet changes annually as vehicles are retired and replaced. In calculating the Average Kilometres Travelled, vehicles less than 2 months in age were removed from the calculation as the low distances travelled by these vehicles was found to distort the data.

Number Leased

Not applicable as Powerlink does not lease vehicles.

Proportion of total fleet expenditure allocated as regulatory expenditure (000's)

The allocation methodology used to apportion the usage of Regulated expenditure was based on Labour Time Charged by employees to Regulated activities.

Sheet: 2.7 Vegetation Management

Table: 2.7.1 Descriptor Metrics by Zone

RIN requirements

This section has been completed in accordance with Appendices E and F of the Category Analysis RIN.

Table 2.7.1 has been populated with actual and estimated data. Specifically:

- route line length within zone (km) is actual data;
- number of maintenance spans is estimated data;
- length of maintenance spans is estimated data;
- average number of trees per maintenance span is estimated data;
- length of vegetation corridors (km) is estimated data;
- average width of vegetation corridors (metres) is estimated data; and
- average frequency of cutting cycle (years) is estimated data.

Source

Data for Table 2.7.1 was sourced from Powerlink's corporate enterprise resource planning database, SAP. However, in relation to vegetation corridors, Powerlink also sourced data from its LIDAR surveys and its spatial database.

Methodology and assumptions

Zones

In determining its standard of vegetation management the primary legislation with which Powerlink must comply are the *Queensland Electrical Safety Act 2002* and the *Queensland Safety Regulation 2013* which impose obligations for ensuring public safety. The regulations include setting exclusion zone distances from electrical apparatus and section 216 specifically refers to trimming of trees near overhead electric lines. These obligations are taken into account when setting vegetation management activities and maintenance intervals.

Powerlink has adopted three vegetation management zones – urban, rural and tropical - based on material differences in recognised cost drivers. Powerlink categorised each built section into one of the above zones based on geographical location.

The tropical, rural and urban zones are based on vegetation growth rates and tree pruning requirements in capital / provisional cities. These requirements are reflected in different vegetation cycles and costs. The categorisation of lines into these zones are illustrated in the map included in Appendix B. Urban typically represents urban populated areas, tropical generally includes coastal lines north of Mackay and rural the remainder of the state.

Powerlink applies different strategies for vegetation management in the three defined zones due to:

- accelerated vegetation growth rates in tropical areas;
- restrictions on ground access and field work during the six month tropical wet season;
- urban corridors containing more landholders and linked stakeholders restricting ground access and field work; and

- increased tree pruning maintenance in urban areas to meet statutory safety requirements.

These have imposed a material cost difference on performing vegetation management and hence resulted in Powerlink's three vegetation zones.

This zone information applies across all vegetation tables in the templates.

Route Line Length within Zone (km)

A list of all built sections, spans, their commissioning dates and lengths was retrieved from SAP. This information was sorted into zones and separated into regulated only based on built section.

Number of Maintenance Spans

Why an estimate is required

Powerlink manages its easements by built section, but is transitioning to individual span management based on condition. While Powerlink's systems will increasingly collect information on which individual spans had maintenance performed, an estimate was required in some instances.

How the estimate has been produced

A list of work orders relating to vegetation maintenance was retrieved from SAP. Each work order was inspected to determine if relevant according to chapter 8, section 8.1 of the Explanatory Statement – final regulatory information notices to collect information for category analysis. Where a specific ground span has not been specified, an estimate of which spans were affected by the work order was made based on the description of the maintenance activity and the costs booked against it. Where more than one maintenance activity occurs on a span, the duplicates are removed so each maintenance span is only counted once.

Total Length of Maintenance Spans

Why an estimate is required

Powerlink manages its easements by built section, but is transitioning to individual span management based on condition. While Powerlink's systems will increasingly collect information on which individual spans had maintenance performed, an estimate was required in some instances.

How the estimate has been produced

The span count from "Number of Maintenance Spans" was split by vegetation management zone and built section. The average span length for the zone was multiplied by the number of maintenance spans in the zone to determine the total.

Average Number of Trees per Maintenance Span (0's)

Why an estimate is required

An estimate is required as Powerlink's vegetation management largely occurs as corridor maintenance. Such maintenance does not include individual tree counts or other inspection duties.

Powerlink considers that its best source of data to estimate this variable is its internal land management inspections data with utilisation of Lidar data.

How the estimate has been produced

The following methodology was applied to estimate the average number of trees from Powerlink's internal land inspection data:

1. Identified maintenance spans with a height category of 4 or greater, which represents an average height of vegetation in the span of 3-5m. This is reasonably consistent with the AER's definition of a tree.
2. From this set of spans, use the density rating to assign a proportion of the span covered with 100% vegetation of interest. Powerlink uses a density category of 5, to represent 50% coverage.
3. Assume 1600 stems per hectare for 100% coverage. A stocking of 1600 stems per hectare equates to a nominal "tree" spacing of 2 metres x 3 metres.

   For example, if a span has an area of 2 hectares, a height category of 4 or greater and a density category of 5 – the span is estimated to contain 1600 stems. This number was confirmed with a small number of established plots. Using this hypothesis, Powerlink used spatial mapping to produce an average for the network.
4. The resulting average number of trees is applied to all zones, with improved data from Lidar surveys and targeting higher risk spans.

The methodology assumes that:

- the density category allocated to a span aligns with the number of stems per hectare;
- the number of stems is scalable up to the area of the span and can be averaged over the state.

Powerlink considers that this methodology provides its best estimate of the average number of trees per vegetation maintenance span. The estimated number of trees continues to improve as additional data becomes available. However, a broad number of assumptions are still required.

Length of Vegetation Corridors (km)

Why an estimate is required

Powerlink manages its easements by built section, but is transitioning to individual span management based on condition. While Powerlink's systems will increasingly collect information on which individual spans had maintenance performed, an estimate was required in some instances.

How the estimate has been produced

An estimate of the length of vegetation corridors is established by dividing the route line length in the vegetation zone by Powerlink's asset management policy cycle time for the particular vegetation zone.

Average Width of Vegetation Corridors (m)

Why an estimate is required

Powerlink manages its easements by built section, but is transitioning to individual span management based on condition. While Powerlink's systems will increasingly collect information on which individual spans had maintenance performed, an estimate was required in some instances.

How the estimate has been produced

A list of all built sections, spans, and lengths was retrieved from Powerlink's spatial database. This information was sorted into zones based on built section.

The attributes associated with each span identified the width to the left and the right of the centre of the span where maintenance is performed. These were added together to get an overall width of vegetation corridor per span. The data was first separated by zone and an average was calculated using the span width to identify the average width per vegetation management zone.

As Powerlink only has information on vegetation maintenance per built section and not per span, Powerlink has assumed that maintenance is performed on all spans in a built section.

Powerlink considers that this methodology provides its best estimate of the average width of vegetation corridors.

Average Frequency of Cutting Cycle (Years)

Why an estimate is required

While Powerlink now manages its easements by individual spans, there are intensive spans within the defined zones that require additional condition assessments and treatments.

How the estimate has been produced

An estimate of the average frequency of cutting cycles is based on Powerlink's asset management policy cycle time[8] for the particular vegetation zone. That is:

- Urban – cutting cycle every year;
- Tropical – cutting cycle every 2 years; and
- Rural – cutting cycle every 3 years.

[8] Cycle times may vary within vegetation zones depending on local factors.

Table: 2.7.2 Expenditure Metrics by Zone

RIN requirements

This section has been completed in accordance with Appendices E and F of the Category Analysis RIN.

Table 2.7.2 has been populated with estimated data.

Source

The data has been sourced from Powerlink's corporate enterprise resource planning database, SAP.

Methodology and assumptions

Powerlink adopted the following approach to preparation of the data for this table.

Tree trimming, Vegetation corridor clearance, contractor liaison expenditure, Other vegetation management costs not specified

Why an estimate is required

Powerlink captures routine vegetation management costs against the activities of tree trimming, chemical treatment, mechanical clearing, vegetation inspection, land costs and vehicle washing. From this information costs have been redistributed to meet the AER's RIN cost categories. For this reason all costs in Table 2.7.2 are considered estimates.

Vegetation audits are undertaken as part of Powerlink's overall maintenance audits. The individual costs associated with the vegetation component of the audit are not captured separately. Total maintenance audit costs are included in maintenance support (2.10 Overheads). The audit fields in Table 2.7.2 are assigned a zero value.

How the estimate has been produced

Vegetation costs were retrieved from SAP and combined to meet each service subcategory as required in Table 2.7.2. The cost information was aggregated into zones and the regulated portion was extracted based on built section.

Further, expenditure estimates were derived using the methodology to unburden corporate overheads (including procurement overheads) from the cost data using the processes described in relation to Table 2.2.1 (Repex) of the Basis of Preparation document.

Audit Costs

Powerlink's systems do not separately record audit costs. See above.

Other vegetation management costs not specified

For clarification, other vegetation management costs not specified include: monitoring of vegetation in spans with known bushfire risk, undergrowth vegetation control to mitigate bushfire hazard, vegetation management in and around structures, identification, assessment, monitoring and control of regulated declared/ noxious weed areas in corridor and specialist vegetation management work using alternate control methods.

Table: 2.7.3 Descriptor Metrics across all Zones – Unplanned Vegetation Events

RIN requirements

This section has been completed in accordance with Appendices E (sections 1, 3 and 11) and F of the Category Analysis RIN.

Table 2.7.3 has been populated with actual data.

Source

Data has been sourced from Powerlink's internal network operating systems associated with recording the unplanned system outages caused by either vegetation grow-ins or vegetation blow-ins/fall-ins. The records include the occurrence of system outages caused by either vegetation grow-ins or vegetation blow-ins/fall-ins, resulting in an unplanned outage of the transmission network.

Methodology and assumptions

The unplanned system outages of Powerlink network assets which were caused by either vegetation grow-ins or vegetation blow-ins/fall-ins are included in the count for the number of events irrespective of whether there was a loss of supply[9].

Force Majeure[10] events are excluded in the count for the number of events.

The methodology applied for the *system outages* caused by either vegetation grow-ins or vegetation blow-ins/fall-ins is as follows:

- Powerlink assessed the cause of each unplanned outage event record against the definition of either vegetation grow-ins or vegetation blow-ins/fall-ins.
- Where an unplanned outage event was caused by either vegetation grow-ins or vegetation blow-ins/fall-ins, the associated record was included in the count for the number of events.
- The number of unplanned outage events caused by either vegetation grow-ins or vegetation blow-ins/fall-ins was summated for each financial year.

The methodology applied for the *fire starts* caused by either vegetation grow-ins or vegetation blow-ins/fall-ins is as follows:

- Powerlink assessed each unplanned outage event record against the definition of fire starts caused by either vegetation grow-ins or vegetation blow-ins/fall-ins.
- Where a fire start was caused by either vegetation grow-ins or vegetation blow-ins/fall-ins, the associated record was included in the count for the number of events.

[9] RIN definition for vegetation grow-ins and vegetation blow-ins/fall-ins refers to "an interruption to supply". However, Powerlink has assumed that the unplanned vegetation events refers to system outages of Powerlink's network assets and shall be counted irrespective of whether there was a loss of supply to customers.
[10] As defined in Australian Energy Regulator (2012). Final Decision – Electricity Transmission Network Service Providers Service Target Performance Incentive Scheme, December, p38.

- The number of fire starts caused by either vegetation grow-ins or vegetation blow-ins/fall-ins was summated for each financial year.

Multiple RIN categories reported for a single event - where a single event results in the criteria being met for more than one RIN category, the event will be reported in multiple RIN categories as relevant.

Sheet: 2.8 Maintenance

Section: 2.8.1 Descriptor Metrics for Routine and Non-Routine Maintenance

RIN requirements

This section has been completed in accordance with Appendices E and F of the Category Analysis RIN.

Table 2.8.1 has been populated with estimated data only.

Source

All asset quantity data has been sourced from Powerlink's corporate enterprise resource planning database, SAP, with non-regulated assets having been removed.

Powerlink has used as commissioned dates for all entries.

Methodology and assumptions

Powerlink has adopted the following methodologies and assumptions in relation to the maintenance asset categories and quantities identified in the templates.

General

For all maintenance asset categories except 'Substation – Power Transformers, only inspection activities apply. Powerlink determines its maintenance activities on the basis of condition assessment. As a result, maintenance cycles are not applicable.

The 'Asset Quantity Inspected/Maintained' reflects the total number of assets subjected to a maintenance or inspection action in that specific year[11].

As required by the RIN[12], where multiple inspection and maintenance activities exist, Powerlink has reported the cycle that reflects the highest cost activity.

Why an estimate is required

Powerlink's systems do not record information in the form required under the RIN categories.

How the estimate has been produced

Powerlink has applied judgment to allocate the activities sourced from its internal records to the activities and categories required by the AER under the RIN.

[11] Category Analysis RIN, section 10.9, p31.
[12] Category Analysis RIN, section 10.7, p31.

Estimates were derived using the following methodologies:

- Inspection and maintenance activities have been allocated following a review of work orders for the asset category as well as routine inspection cycles.
- Inspection and Maintenance cycles are the highest cost activity based on frequency, work units and total annual associated cost.

Transmission Lines Maintenance

Transmission Towers

A list of all regulated transmission tower structures and their commissioning date was retrieved from SAP.

Multiple inspection activities exist for this asset group. The highest cost activity is the annual patrol (inspection) which includes both ground and aerial patrols.

Transmission Tower Support Structures

Consistent with the RIN[13], the highest value (ie. highest replacement cost) asset type in this asset category is insulator strings. Powerlink has separated cycle information in Table 2.8.1 by tower support structures and insulator strings (the latter is shown in the additional asset subcategory row identified as 'Transmission Tower Support Structures – Insulator Strings' (see more information on this below).

As support structures are on all towers, the asset quantities at year end for both towers and support structures are the same.

Multiple inspection activities exist for this asset group. The highest cost activity identified is the annual patrol which includes both ground and aerial patrols (inspection).

Conductors

The route length of all Powerlink conductors was sourced from Powerlink's corporate enterprise resource planning database, SAP, with non-regulated assets having been removed.

Multiple inspection activities exist for this asset group. The highest cost activity identified is the annual patrol which includes both ground and aerial patrols (inspection).

[13] Category Analysis RIN, section 10.6, p31.

Transmission Cables

The route length of all regulated Powerlink underground cable feeders was sourced from Powerlink's corporate enterprise resource planning database, SAP, with non-regulated assets having been removed.

Multiple inspection activities exist for this asset group. The highest cost activity identified is the 6-monthly level 1 maintenance (inspection).

Transmission Tower Support Structures - Insulator Strings

Powerlink has added a separate row for insulator strings as they have a different expected life and inspection cycle to towers and support structures.

The highest value (ie. highest replacement cost) asset type in the Transmission Tower Support Structure asset category is insulator strings which is why it has been separated out into a new asset subcategory to provide inspection cycle data.

A list of all regulated insulator strings and their installation date was retrieved from SAP. The quantity of strings reported are individual strings as there is no grouping involved.

Multiple inspection activities exist for this asset subcategory. The highest cost activity identified is the in-situ testing and inspection. This inspection requires 5% of the Asset Quantity for each built section to be inspected at a frequency determined by the corrosion region. Due to the limited work order data available for the required period, Powerlink has estimated the 'Asset Quantity Inspected/Maintained' to be 1% of the 'Asset Quantity – At Year End'.

Corridor Maintenance (Non-Veg)

Powerlink has added a separate row for corridor maintenance (non-veg) as the associated data did not fit within the existing subcategories of Transmission Lines Maintenance or the definition of vegetation in relation to sheet 2.7 Vegetation Management.

A list of all easements and their commissioning dates were retrieved from SAP.

Multiple inspection and work activities exist for this asset subcategory. The highest cost activities identified are access track inspections and washdown maintenance. This subcategory is also inspected during the land asset inspections as detailed below.

Inspections are scheduled in maintenance plans based on the following:

Tropical Land Management Inspections (corridors)

- Every 2 Years (High Growth)

Rural Land Management Inspections (corridors)

- Every 3 Years

Urban Land Management Inspections (corridors)

All Regions:

- All – Every 1 Year (High property density and tree hazard)

Land Management Inspections (sites)

All Regions:

- All – Every 1 Year (High maintenance required)

The 'Asset Quantity Inspected/Maintained' is calculated by reviewing work orders from access maintenance plans by built section. The total route length kilometres were calculated from SAP built section records.

The 'Average Age of Asset Group' for this Asset Subcategory was based on the commissioning dates of the associated Transmission Line built sections.

Substation Equipment and Property Maintenance

Substation Switch-bays (incl. Reactive Plant)

A list of all regulated substation bays containing switching equipment was retrieved from SAP.

Multiple inspection activities exist for this asset group. The highest cost activity identified is the 6-yearly services for isolators, earth switches and circuit breakers (inspection).

Substation Power Transformers

A list of all regulated power transformers was retrieved from SAP.

Multiple inspection and maintenance activities exist for this asset group. The highest cost activities identified are:

- for inspection, the 6-monthly routine substation maintenance; and
- for maintenance, the 6-yearly power transformer tapchanger service.

Substation Property

A list of all regulated, commissioned substation sites including cable transition sites was retrieved from SAP.

Multiple inspection activities exist for this asset group. The highest cost activity identified is the 6-monthly routine substation maintenance (inspection).

SCADA & Network Control Maintenance

SCADA and Network Control Maintenance

A list of all regulated communications, control and supervisory equipment assets were retrieved from SAP.

Multiple inspection activities exist for this asset group. The highest cost activity identified is the yearly routine telecommunications maintenance (inspection).

All equipment of the integrated secondary systems that control, monitor and supervise substation plant and power system network have been accounted for under the SCADA & network control category, including communications.

The assets included in this subcategory are:

- Telecommunications – access and transport equipment (multiplexers, MPLS nodes, DWDM sub-racks), microwave radio, UHF/VHF equipment;
- SCADA – control and supervisory IEDs, HMIs, servers, edge routers, access switches; and
- Meters.

The average age of this asset group was based on commissioning dates.

Protection Systems Maintenance

Protection Systems Maintenance

A list of all regulated protection relays was retrieved from SAP.

Multiple inspection activities exist for this asset group. **The highest cost activity identified is the 6-yearly routine protection system service (inspection)**.

The average age of this asset group was based on commissioning dates.

Table: 2.8.2 Cost Metrics for Routine and Non-Routine Maintenance

RIN requirements

This section has been completed in accordance with Appendices E and F of the Category Analysis RIN.

Table 2.8.2 has been populated with estimated data.

Source

The data has been sourced from Powerlink's Regulatory Financial Statements and its Financial Systems.

Methodology and assumptions

The direct costs reported in Table 2.8.2 include Powerlink's operating expenditure for Maintenance Service Providers, which have been categorised as attributable costs.

For the asset subcategory of 'Conductors' no routine maintenance costs apply. As Powerlink determines its inspection activities on the basis of condition assessment, costs have been categorised as non-routine completed by work order.

In Table 2.8.2, the asset subcategory 'Transmission Towers Support Structures' includes the maintenance costs for insulator strings. Consistent with the RIN[14], while 'Transmission Tower Support Structures – Insulator Strings' has been listed as an additional asset subcategory for inspection cycles, the RIN does not require a breakdown of the corresponding dollar expenditure in Table 2.8.2.

Maintenance expenditure has been reported in $0's.

Why an estimate is required

Powerlink's financial systems do not record cost information in the form required under the RIN.

How the estimate has been produced

Powerlink has applied its judgment to allocate costs to the asset categories and sub-categories required under the RIN.

Expenditure estimates were also derived using the methodology to unburden corporate overheads (including procurement overheads) from the cost data using the processes described in relation to Table 2.2.1 (Repex) of the Basis of Preparation.

[14] Category Analysis RIN, Explanatory Statement, section 9.2, p108.

Sheet: 2.10 Overheads

Table: 2.10.1 Network overheads expenditure

Table: 2.10.2 Corporate overheads expenditure

RIN requirements

This section has been completed in accordance with Appendix E (sections 1, 3 and 12) of the Category Analysis RIN.

Tables 2.10.1 and 2.10.2 have been populated with estimated data to reflect the required RIN adjustment for the removal of Corporate Overheads and to meet RIN definitions.

Consistent with the RIN[15], the template data reflects operating and capital expenditure before any capitalisation of overhead expenditure.

Source

The data has been sourced from Powerlink's Regulatory Financial Statements and financial systems.

Methodology and assumptions

As a base, Powerlink utilised the expenditure reported in its Regulatory Financial Statements for the categories Maintenance Support, Network Monitoring and Control and Corporate Overheads. Subsequent adjustments were applied to this information to align each category with the RIN definition. Finally the allocated Corporate overhead expenditure was removed (refer methodology below).

Removal of Corporate Overhead Expenditure

Why an Estimate is required

Powerlink's financial systems do not record cost information in the form required under the RIN.

How the estimate has been produced

As identified above, Powerlink has applied judgment to allocate its current expenditure categories into those required by the AER under the RIN.

Expenditure estimates were also derived using the methodology to unburden corporate overheads (including procurement overheads) from the cost data using the processes described in section 2.2.1 (Repex) of the Basis of Preparation.

Expenditure Allocation between Prescribed and Non-Prescribed

Powerlink allocates costs between Prescribed and Non-Prescribed activities based on the labour time charged for activities within these categories.

[15] Category Analysis RIN, section 12.1.

Sheet: 2.11 Labour

Table: 2.11.1 Cost Metrics per Annum

RIN requirements

This section has been completed in accordance with Appendix E (sections 1, 3 and 4) of the Category Analysis RIN.

Table 2.11.1 has been populated with estimated data.

Source

The data has been sourced from Powerlink's Human Resource and Financial Systems.

Methodology and assumptions

General

Why estimates are required

Powerlink's systems do not record the labour cost information at the level required by the RIN.

How the estimate has been produced

Powerlink has disaggregated the Average Staffing Level (ASL), Total Labour Costs and Average Productive Work Hours to prescribed transmission services based on the pro-rata allocation of time charges to prescribed and non-prescribed activities from all service providers to all activities.

Information from Powerlink's HR system has been used to identify ASL's and the metrics related to average productive hours.

Salary and Wage data has been sourced from the financial reporting systems and allocated to employee category. Costs that could not be directly attributed to a position have been apportioned to similar positions within the same employee category. Primarily these apportionments relate to labour hire costs and end of year adjustments to leave entitlements.

Labour Classification Level

Powerlink has included the following employee types in each of the relevant Classification Levels required under the RIN:

RIN Labour Classification Level	*Powerlink Job(s) or other definition*
Executive Manager	Chief Executive and Division Managers
Senior Manager	Group Managers and previous equivalents
Manager	All other Managers and Team Leaders
Professional	Engineer, Accountant, Professional – Other, Construction Management, Project Management, Information Technology.
Semi Professional	Engineering Officer, System Controller.
Support Staff	Administration.

Intern, Junior Staff, Apprentice	Administration Trainee, Co-op/Vacation Student, Development Engineer, Development Engineering Officer, Graduate IT, Development Environmental Officer.
Skilled Electrical Worker	Trade Technician (Lines, Subs, Sec Sys), Supervisor, Field based engineering officers who also hold a trade, Labour hire in Construction Inspector positions.
Skilled Non-Electrical Worker	None applicable at Powerlink.
Apprentice	Apprentice, Apprentice Linesperson, Intern & Junior Staff.
Unskilled Worker	Power Worker.

Total Labour Cost

Salary and Wage data has been sourced from the financial reporting systems and allocated to employee category. Costs that could not be directly attributed to a position have been apportioned to similar positions within the same employee category. Primarily these apportionments relate to labour hire costs and end of year adjustments to leave entitlements.

For clarification, Powerlink has included employees that are consistent with the AER's RIN definitions as noted above. However, where employees were unable to be assigned to the RIN definitions they were excluded from Table 2.11. Predominantly these staff relate to those responsible for the delivery of infrastructure and technical services.

Productive Work Hours

Powerlink has used the following methodology to estimate the productive work hours:

1. Derived Gross Productive Hours per employee.
2. Added Overtime hours worked.
3. Reduced estimate by leave taken.
4. Reduced estimate by training hours.

Gross Productive Hours was derived as follows:

- Permanent full and part time employee FTE for each year was multiplied by the standard contract hours to determine the Gross Productive hours for each employee; and
- Contract and Casual employees productive hours were based on actual hours worked.

Overtime Hours Worked was based on actual overtime hours worked by employees.

Leave Taken was based on actual leave taken.

Training Hours has been estimated using the following method:

- Apprentices were estimated to have undertaken 4.69 weeks of training per year based on historical averages.

- Field Services employees training hours were estimated to be 4.5% of their standard contracted hours.

- All other employees training hours were estimated to be 4% of their standard contracted hours.

Stand-down Occurrences

Powerlink does not monitor "Stand Down Occurrences Per ASL". As such it has no basis on which to make estimates or provide actual data.

Table: 2.11.2 Extra Descriptor Metrics for Current Year

RIN requirements

This section has been completed in accordance with Appendix E (sections 1, 3 and 4) of the Category Analysis RIN.

Table 2.11.2 has been populated with estimated data.

Source

The data has been sourced from Powerlink's Human Resource and Payroll systems.

Methodology and assumptions

Powerlink has adopted the following methodology to complete the labour metrics table for the current year.

Why estimates are required

Powerlink's systems do not record the labour cost information at the level required by the RIN. Powerlink's HR information systems record the hours related to temporary labour hire and do not track the costs. Further, overtime hours are not specifically identified for temporary labour hire.

How the estimate has been produced

The average productive work hours and the related hourly rates have been calculated for Powerlink employees only. Powerlink considers that for the purposes of calculating an average rate the average would not materially differ due to the similar nature of the work.

Costs for the calculation of average hourly rates have been calculated from payroll data in line with the AER definitions.

1. Annual ordinary time hours costs – average productive hours hourly rate per ASL.

Labour costs - ordinary time salaries and wages	included
Labour costs - other earnings, on-costs, and taxes	not included
Labour costs – Super	not included

2. Annual overtime hours costs – average productive hours hourly rate per ASL.

Labour costs - ordinary time salaries and wages	not included
Labour costs - other earnings, on-costs, and taxes	Include overtime and allowances related to overtime hours.
Labour costs – Super	not included

Sheet: 2.12 Input Tables

Table: 2.12 Input tables

RIN requirements

This section has been completed in accordance with Appendix E (sections 1, 2 and 3) and Appendix F of the Category Analysis RIN.

Source

The data has been sourced Powerlink's Regulatory Financial Statements and Powerlink's financial systems.

Methodology and assumptions

Powerlink adopted the following methodology to preparation of Table 2.12.

Why an estimate is required

Powerlink's financial systems do not record cost information in the form required under the RIN.

How the estimate has been produced

Opex Data

The Opex data for Vegetation Management, Routine Maintenance, Non-Routine Maintenance and Overheads was sourced from Templates 2.7.2, 2.8.2 and 2.10 and utilises the same methodology and assumptions discussed in the relevant sections of the Basis of Preparation.

To determine the split between direct material cost, direct labour cost, contract cost and other cost, Powerlink has considered the nature of the expenditure recognised against cost elements and then grouped them by nature into one of the four categories required by the RIN.

Expenditure estimates were derived using the methodology to unburden corporate overheads (including procurement overheads) from the cost data using the processes described in relation to Table 2.2.1 (Repex) of the Basis of Preparation.

Capex Data

The projects used to populate Templates 2.2.1, 2.3.1, 2.3.2 and 2.5.1 were also utilised as the base to identify the "As Incurred" Capex data required for Template 2.12.

To determine the split between direct material cost, direct labour cost, contract cost and other cost, Powerlink has considered the nature of the expenditure recognised against cost elements and then grouped them by nature into one of the four categories required by the RIN.

To determine the sub-category split for the "As Incurred" capital expenditure Powerlink applied the same sub-category apportionment used in Templates 2.2.1, 2.3.1, 2.3.2 and 2.5.1 for the "As Commissioned" capital expenditure reporting.

Expenditure estimates were derived using the methodology to unburden corporate overheads (including procurement overheads) from the cost data using the processes described in relation to Table 2.2.1 (Repex) of the Basis of Preparation.

Sheet: 5.2 Asset Age Profile

Table: 5.2.1 Asset age profile

RIN requirements

This section has been completed in accordance with Appendix E (sections 1, 3 and 6) of the Category Analysis RIN.

Table 5.2.1 has been populated with actual data for installed assets and estimated economic lives. The standard deviation has been calculated as the square root of the estimated mean economic life.

Source

All installed asset data has been sourced from Powerlink's corporate enterprise resource planning database, SAP. This includes the year of asset commissioning. For clarification, differences in the timing between Table 5.2.1 Asset age profiles and Table 2.2 Repex, Table 2.3 Augex and Table 2.5 Connections are due to:

- the commissioning dates being reported here, whereas the repex, augex and connections tables reflect capitalisation dates; and
- the original installation dates included here and asset transfer (and purchase) dates shown in the repex and augex tables.

Methodology and assumptions

Powerlink has adopted the following methodologies and assumptions in relation to the specific asset groups identified in the templates.

For clarification, consistent with the RIN, installed assets reported in the Table 5.2.1 reflect assets as at 30 June 2019. Any assets that were constructed and decommissioned prior to 30 June 2019 do not appear in the data.

Transmission towers by: highest operating voltage; circuit configuration

A list of all prescribed transmission tower structures (including poles), their commissioning year, operating voltage and circuit configuration was retrieved from SAP. The data was aggregated based on the number of towers per commissioning year/voltage/circuit configuration.

Towers which have undergone line refit are reported in a separate line in accordance with the RIN instructions[16], namely "Transmission towers > 66kV & <= 132kV refurbished". Consistent with its Transmission Determination[17], as line refits extend the original life of the asset, it is appropriate to treat them as capital expenditure.

Towers which have been refit and included under "Transmission towers > 66kV & <= 132kV; refurbished" have not been included in other categories under "transmission towers by highest operating voltage; circuit configurations" to ensure that they are only counted once.

[16] Category Analysis RIN, section 6.1(b), p22.
[17] Australian Energy Regulator (2012), Final Decision, Powerlink Transmission Determination 2012/13 to 2016/17, pp203-209.

Consistent with Powerlink's capitalisation policy, operational refurbishment projects do not extend the original life of an asset and are treated as operating expenditure. Therefore, such refurbishment works are reported in the RIN response under maintenance expenditure.

Transmission tower support structures by: highest operating voltage; circuit configuration

A list of all prescribed insulator strings, their commissioning year, operating voltage and tower circuit configuration was retrieved from SAP. The data was aggregated based on the number of insulators per commissioning year/voltage/tower circuit configuration. These components typically last approximately 30 years, depending on environmental conditions, materials and construction.

Conductors by: voltage; summer normal rating[18]

A list of all prescribed circuit kilometres, their commissioning year, operating voltage and feeder identification was retrieved from SAP. The maximum summer normal rating for each feeder was retrieved from Powerlink's rating database, TNDB. The data was aggregated on the basis of the number of circuit kilometres per commissioning year/voltage/ summer normal rating.

Transmission cables by: voltage; insulation type

A list of all prescribed underground cable feeders, their commissioning year, operating voltage and insulation type was retrieved from SAP. The data was aggregated based on the number of underground cable feeder circuit kilometres per commissioning year/voltage/insulation type.

Substation switch-bays by: highest operating voltage; switch type

A list of all prescribed substation equipment records for hybrid gas insulated switchgear (GIS) modules, circuit breakers, isolators, earth switches, voltage transformers (VTs), and current transformers (CTs), grouped by switch-bay was retrieved from SAP. As Powerlink's switch-bays may contain one or more of the switch types specified in the RIN, a hierarchy was determined in the following order:

1. GIS module;
2. Air insulated circuit breaker;
3. Air insulated isolators/earth switch;
4. VT; and
5. CT.

Each switch-bay (and the equipment therein) was counted only once based on the highest level component. For example, if a switch-bay contained an air insulated circuit breaker, an air insulated isolator, and a CT, the switch-bay would be counted as an air insulated circuit breaker bay.

The data was aggregated on the basis of the number of switch-bays per switch-type commissioning year/voltage/switch-type.

[18] Ratings have been estimated, consistent with Powerlink's methodology described in section 2.3.2 Augex.

Substation power transformers by: voltage; MVA rating[19]

A list of all prescribed equipment records for power transformers was retrieved from SAP. The data was aggregated on the basis of the commissioning year/voltage/MVA rating. The data includes spare transformers to be consistent with Table 2.8, maintenance, in the templates.

Substation reactive plant by: voltage; function

A list of all prescribed equipment records for static var compensators (SVCs), capacitor banks, and oil filled reactors was retrieved from SAP. The data was aggregated on the basis of the commissioning year/voltage/equipment type.

SCADA, network control and protection systems by: function

A list of all communications and secondary systems equipment records was retrieved from SAP. The records were broken down by the following functions:

- Telecommunication network/systems including:
  - Access and transport equipment – multiplexers, MPLS and DWDM sub-racks.
  - Microwave radios; and
  - VHF and UHF radios.
- Station SCADA and control systems:
  - Control and supervisory IEDs;
  - Local control facilities, HMIs; and
  - Edge routers, access switches
  - Metering systems, including meters.
  - Protection schemes/systems including protection relays.

The data was aggregated on the basis of the commissioning year/function and does not align with the replacement expenditure data in sheet 2.2 (Repex), which is based on the financial asset capitalisation date.

Buildings

A list of all prescribed network buildings was retrieved from SAP. The data was aggregated on the basis of the number of buildings per commissioning year.

Site infrastructure

A list of all prescribed network sites was retrieved from SAP. The data was aggregated on the basis of the number of sites per commissioning year.

Economic Lives

Why an estimate is required

Powerlink's systems do not record economic life data for its population of assets in the form required by the AER.

[19] Ratings have been estimated, consistent with Powerlink's methodology described in section 2.3.2 Augex.

How the estimate has been produced

Powerlink has sourced the economic life for the following asset classes from the AER's Transmission Determination for Powerlink's 2017/18 to 2021/22 regulatory period:

- transmission lines – 50 years;
- cables – 45 years;
- substation and site infrastructure – 40 years; and
- secondary systems – 15 years.

Powerlink estimated the economic life of the following asset classes:

- Line Refits - 15 years is the estimated line refit economic life. In the AER's Draft Decision[20] the AER considered that a 15 year asset life was appropriate for capex associated with transmission lines surface preparation and painting works. Powerlink also consider that these works will typically only last approximately 15 years. Hence an estimated economic life of 15 years is assumed.

- Buildings - 23 years is the estimated weighted average economic life of the substation buildings. Pre 2000 substation buildings are of a brick construction and have an estimated nominal life expectancy of 40 years. Post 2000 substation buildings are typically demountable and have an estimated nominal life expectancy of 15 years.

[20] Australian Energy Regulator (2011), Draft Decision, Powerlink Transmission Determination 2012/13 to 2016/17, p254.

Sheet: 5.3 Maximum Demand at Network Level

Table: 5.3.1 – Raw and weather corrected coincident maximum demand at network level (summed at transmission connection point)

RIN requirements

This section has been completed in accordance with sections 1, 3 and 8, Appendix E of the Category Analysis RIN.

Table 5.3.1 has been populated with actual data except for "Weather corrected (10% POE) network coincident MD" and "Weather corrected (50% POE) network coincident MD" which are populated with estimated data.

Source

Power demand and embedded generation recordings were sourced from Powerlink's metering database. This contains half hour average demands for each connection point and embedded generator, expressed as kW and kVAr. Raw data has been provided by registered Meter Data Providers (MDP)[21] as required under the National Electricity Rules. Weather data was sourced from the Bureau of Meteorology website[22].

Methodology and assumptions

Raw network coincident MD

This is the summation of actual unadjusted (i.e. not weather normalised) demands at Powerlink's downstream connection and supply locations at the time when this summation is greatest. Export demand is provided for interconnector flows at this same time.

Date and time of raw network coincident MD

This is the date and time when the raw network coincident MD occurs. Note that the times listed in Table 5.3.1 are the time of the half hour ending (e.g. 00:30 corresponds to the half hour period 00:00 to 00:30).

Winter/Summer peaking

This is the season associated with the date when the raw network coincident MD occurs.

Embedded Generation

This is the summation of embedded generation at the time of raw network coincident MD. Details on the type of embedded generation are set out below in relation to Table 5.4.1.

[21] National Electricity Rules, AEMC, Version 124, 12 August 2019, clause 7. 3.2 (d1).
[22] www.bom.gov.au

Weather corrected (10% PoE) network coincident demand

While this measure is based on actual data, being the non weather adjusted maximum demand, it is also materially dependent on judgments and assumptions in developing the methodology for weather adjustment. As there is no independent means of verifying the correctness or otherwise of historical weather adjustment Powerlink considers this variable will remain as estimated data in the future.

The 10% POE coincident weather adjusted maximum demand was calculated using similar statistical calculations to the 50% POE coincident weather adjusted maximum demand, which was reported in Powerlink's 2019 TAPR[23].

Weather corrected (50% PoE) network coincident demand

While this measure is based on actual data, being the non weather adjusted maximum demand, it is also materially dependent on judgments and assumptions in developing the methodology for weather adjustment. As there is no independent means of verifying the correctness or otherwise of historical weather adjustment Powerlink considers this variable will remain as estimated data in the future.

The 50% POE coincident weather adjusted maximum demand aligns with the 50% POE coincident weather adjusted maximum demand, which was reported in Powerlink's 2019 TAPR[23].

[23] www.powerlink.com.au/reports/transmission-annual-planning-report-2019

Sheet: 5.4 Maximum Demand And Utilisation at Spatial Level

Table: 5.4.1 Non-coincident & Coincident Maximum Demand

RIN requirements

This section has been completed in accordance with sections 1, 3 and 8 of Appendix E and Appendix F of the Category Analysis RIN.

All variables in Table 5.4.1 have been populated with actual data except for:

- "Connection point rating which has been populated with estimated data; and
- "Weather Corrected MD" measures. While these measures are based on actual data, being the non-weather adjusted maximum demand, it is also materially dependent on judgments and assumptions in developing the methodology for weather adjustment. As there is no independent means of verifying the correctness or otherwise of historical weather adjustment Powerlink considers this variable will remain as estimated data in the future.

Consistent with the AER's approach, prescribed and non-prescribed connection points are included.

Source

Connection point rating

Data for connection point rating has been obtained from Powerlink's Enterprise Resource Planning system (SAP).

Raw adjusted maximum demand

Power demand and embedded generation records are sourced from Powerlink's metering database. Half hour interval energy (kWh and kVArh) values are recorded for connection points. Raw demand and embedded generation data has been provided by registered Meter Data Providers (MDP) [24] as required under the National Electricity Rules.

Information on network outages which may have impacted connection point demands is sourced from Powerlink's outage management system, called OSTRAC. Raw information is populated into this system through normal business processes as outages are applied for, evaluated, scheduled and conducted. This system also stores information on some outages on other networks (e.g. Energex and Ergon) that impact on the Powerlink network. In situations where it was not clear whether a maximum-demand record may have been impacted by a distribution network outage, Powerlink sought clarification from the respective DNSP regarding the occurrence of any outages.

Weather corrected maximum demand

Weather data are sourced from the Bureau of Meteorology website[25]. Power demand records used in the weather adjustment calculation are sourced from Powerlink's metering database (as per the raw adjusted maximum demand). Non-coincident weather corrected 50% POE and

[24] National Electricity Rules, AEMC, Version 124, 12 August 2019, clause 7.3.2 (d1)

[25] www.bom.gov.au

10% POE demands for Energex and Ergon connection points have been sourced from Energex and Ergon respectively.

Methodology and assumptions

Connection Point Rating

Clause 8.11 of Appendix E of the Category Analysis RIN states that rating refers to normal cyclic rating. Further explanation was provided by AER in its response to Issue 88 raised by ElectraNet[26]. As required by the AER, connection point rating reflects the total installed capacity at a connection point in its normal operating condition.

Why an estimate is required

Equipment ratings are calculated using a rating methodology which requires judgments to be made on a number of input assumptions and criteria and choice of methodology which relate to the operation of Powerlink assets. The resulting rating is therefore dependent on the judgments made by Powerlink in regards to rating of its assets.

How the estimate has been produced

Depending on the electrical configuration of the connection point, the rating was calculated by one of the following methods:

1. Where Powerlink owns the step-down transformers that step the voltage down from either the 132 kV or 110 kV network, then the connection point rating is the combined Normal Cyclic Capacity (NCC) ratings or limiting bay ratings of the step down transformers. An example of this is Richlands Substation.

2. In the situation where the DNSP or a direct connect customer owns the step-down transformers that step the voltage down from either the 132 kV or 110 kV Network and Powerlink does not own a 110 kV or 132 kV outgoing feeder to supply the step-down transformer, then the connection point rating is the combined NCC ratings of the feeder bays. An example of this is Alan Sherriff Substation.

3. Where the DNSP or a direct connect customer owns the step-down transformers that step the voltage down from either the 132 kV or 110 kV network and Powerlink owns part or all of the feeder that supplies the step-down transformer, then the connection point rating is the combined NCC ratings of the feeders. The individual rating of feeders that are to be summated, is either the feeder or its associated feeder bay, depending on which is the most limiting. Where the customers step-down transformer is supplied via a Tee arrangement, then the individual rating of the feeder to be summated, will be the minimum rating of the feeder and both feeder bays. An example of this North Goonyella Substation.

4. When there is only one connection point at a 275/132 kV or 275/110 kV injection point, and all outgoing circuits or transformers at 132kV or 110kV are owned by the DNSP, then the connection point rating is the combined NCC ratings or limiting bay ratings of the 275/132 kV or the 275/110 kV transformers. An example of this is Gin Gin Substation.

[26] Final category analysis RINs – issues register – 010414_1157.xlxs

5. When there are multiple connection points that are being supplied by a 275/132 kV or 275/110 kV injection point, or where Powerlink owns outgoing circuits or transformers at 132kV or 110kV, then the connection point rating is the combined NCC ratings of the feeders and/or feeder bays that make up that particular connection point. The individual rating of feeders that are to be summated will include the minimum rating of either the feeder or its associated feeder bay. An example of this is Belmont Substation.

6. Where a separate connection is supplied from the tertiary windings of Powerlink owned transformers the nameplate rating of the relevant transformer tertiary windings is summed together.

The table below indicates which method(s) were relevant to each connection point.

Connection Point	Method Type
Abermain (110)	5
Abermain (33)	1
Algester	1
Ashgrove West (33)	1
Belmont (110)	5
Ashgrove West (110)	2
Bundamba	2
Goodna	1
Loganlea (33)	1
Molendinar	4
Mudgeeraba (110)	5
Mudgeeraba (33)	1
Murarrie	5
Palmwoods	4
Redbank Plains	1
Richlands	1
Runcorn	1
South Pine	5
Sumner	2
Blackstone	5
Tennyson (33)	3
Tennyson (110)	1
Belmont (33)	1
Alan Sherriff	2
Alligator Creek (33)	1
Biloela	1
Blackwater (66/11)	1
Bolingbroke (Rail)	3
Bowen North	1
Bulli Creek (132)	1

Cairns	1
Cairns City	3
Callemondah (Rail)	2
Cardwell	1
Chinchilla	2
Clare South	1
Collinsville Load	1
Columboola (Ergon)	2
Coppabella (Rail)	3
Dan Gleeson	1
Dysart (66/22)	1
Edmonton	1
Egans Hill	1
El Arish	1
Garbutt	1
Gin Gin	4
Calliope River (Ergon)	3
Gladstone South (Ergon 66/11)	1
Grantleigh (Rail)	3
Gregory (Rail)	3
Ingham	1
Innisfail	1
Kamerunga	1
Kemmis	1
King Creek	3
Lilyvale (132)	2
Lilyvale (66)	1
Mackay	1
Mindi (Rail)	3
Moranbah (11)	6
Moranbah (66)	1
Moura (66/11)	1
Mt McLaren (Rail)	3
Nebo	1
Newlands	1
Norwich Park (Rail)	3
Oakey	2
Oonooie (Rail)	3
Pandoin (66)	1
Peak Downs (Rail)	3
Pioneer Valley	1
Proserpine	1
Townsville Switchyard (QLD Nickel)	2

Rockhampton	1
Ross	2
Stony Creek	2
Tangkam	2
Tarong (66)	2
Teebar Creek	4
Tully	1
Turkinje (132)	2
Turkinje (66)	1
Townsville East	1
Townsville South (Ergon)	1
Wandoo (Rail)	3
Woree	2
Yarwun (Ergon)	2
Moranbah (Broadlea)	2
Boyne Island (132)	3
Boyne Island (275)	4 (see note below)
Loganlea (110)	5
North Goonyella	3
Gladstone South (QAL)	3
Rocklea	5
QNI	3
Terranora Interconnector	3
Pandoin (132)	2
Wandoan South (66)	1
Middle Ridge (Energex)	2
Middle Ridge (Ergon)	2
Woolooga (Energex)	2
Woolooga (Ergon)	2
Alligator Creek (132)	3
Blackwater (Rolleston 132)	2

Notes:

Where ratings are determined by methods 2, 3 or 5 above it is likely that the rating will be significantly greater than the maximum demand at the connection point. This is because, unlike transformers, the cost of feeder bay equipment is largely independent of its thermal capacity. Powerlink has standardised much of its substation equipment purchases and the same equipment is installed across a wide variety of loading situations.

Where the season in which non-coincident maximum demand occurs varies between summer and winter, (ie. there is no strong seasonality to the demand) the calculation of rating is based on the summer rating of transmission lines, given the network configuration on the date of the maximum demand. This is because summer line

ratings are materially lower than winter ratings and this difference is greater than the observed variability in demand.

Where connection points are not providing prescribed services[27], the connection point rating has been omitted and the cell shaded black.

Non-Coincident Raw Adjusted MD

Clause 8.10 of Appendix E of the Category Analysis RIN requires Powerlink to use *raw unadjusted maximum demand* as the basis for calculating the *raw adjusted maximum demand*.

A three-step process has been used to identify where the maximum *raw unadjusted demand* records may have been impacted by temporary network arrangements:

1. Using statistical analysis techniques to identify maximum demands at connection points which are unusual compared to other daily maximum demands at the same connection points in the same regulatory year; then
2. Powerlink's record of outages which occurred on the same day as the unusual maximum demand were reviewed to identify any outages likely to have caused the unusual maximum demand on the affected connection point.
3. Since the 2014/15 RIN, a third step has been introduced in which Powerlink has consulted the relevant Distribution Network Service Provider (DNSP) to identify any downstream outages or load transfers which may have affected power flow through the connection point.

If a maximum demand record was identified as unusual and there is a record of an outage which could have affected the load, that day was disregarded and the day with the next highest *raw unadjusted demand* record was considered. This process was repeated until a *raw unadjusted demand* record was identified for the connection point which was not unusual and/or there was no record of a relevant network outage.

2018/19 Explanatory Note 1: For raw adjusted MD, there was one instance in which the coincident MVA value exceeded the non-coincident MVA value. This is a consequence of the fact that the non-coincident MVA parameter indicates the MVA value at the time when the raw adjusted MWs were highest.

In several instances, the time of peak non-coincident MVA demand is different to the time of peak non-coincident MW demand. These incidents are listed below, as required[28]:

Connection points where MVA maximum demand has occurred at a different time to MW maximum demand:

Connection Point	2018/19 MVA
Abermain (110)	66.0
Abermain (33)	108.1
Belmont (110)	417.1
Ashgrove West (110)	126.2
Palmwoods	394.0

[27] Category Analysis RIN, p1 – Matters the subject of this notice.
[28] Category Analysis RIN, Appendix E, clause 8.8

Alan Sherriff	33.4
Alligator Creek (33)	33.6
Cairns City	48.5
Cardwell	5.3
Chinchilla	30.3
Collinsville Load	24.7
Egans Hill	60.6
Gladstone South (Ergon 66/11)	50.6
Ingham	25.2
Innisfail	30.5
Lilyvale (132)	40.6
Pandoin (66)	44.2
Ross	40.9
Tarong (66)	47.3
Townsville East	35.5
Moranbah (Broadlea)	44.4
Terranora Interconnector	203.7
Rocklea	161.4
Woolooga (Energex)	220.4
Woolooga (Ergon)	26.3
Alligator Creek (132)	42.5

Coincident Raw Adjusted MD

Powerlink has reported the *raw adjusted maximum demand* for each connection point at the time of the coincident peak demand in each year.

Similar to the *non-coincident raw adjusted maximum demand*, Powerlink first looked for raw unadjusted demand records at time of coincident peak that appeared unusually high. In 2018/19, the following adjustment was made to remove the estimated effect of load-transfers due to outages which were occurring at the time of coincident MD. This adjustment was undertaken to estimate what actual coincident Maximum Demands would have been without any outages:

- 40MW was deducted from Mudgeeraba 110kV and added to Molendinar.

As no unusual readings were identified at any other connection points, the adjusted and unadjusted connection point maximum demands at time of coincident peak are the same.

Date MD Occurred

For coincident maximum demand this is the date on which the summated demand across all connection points in a single half-hour was greatest.

For non-coincident maximum demand this is the date on which the maximum adjusted demand (identified using the process described above) for that connection point occurred.

In instances where a new connection point was commissioned but did not supply any load in a year (i.e. the customer did not start to draw power), the date of the non-coincident maximum demand was set to be the same as the coincident maximum demand for that year.

Half Hour Time Period MD Occurred

For coincident maximum demand this is the half hour in which the summated demand across all connection points in a single half-hour was greatest.

For non-coincident maximum demand this is the half hour in which the maximum adjusted demand (identified using the process described above) for that connection point occurred.

The times listed in Table 5.4.1 are the time of the half hour ending (e.g. 00:30 corresponds to the half hour period 00:00 to 00:30).

In instances where a new connection point was commissioned but did not supply any load in a year (i.e. the customer did not start to draw power), the time of the non-coincident maximum demand was set to be the same as the coincident maximum demand for that year.

Winter/Summer Peaking

For coincident maximum demand this is the season in which the summated demand across all connection points in a single half-hour was greatest.

For non-coincident maximum demand this is the season in which the maximum adjusted demand (identified using the process described above) for that connection point occurred.

As required by the definitions in the RIN[29], summer corresponds to the period 1 October – 31 March, and winter corresponds to the period 1 April to 30 September.

Adjustments – Embedded Generation

This variable has been populated for the embedded generators listed in the table below.

[29] Regulatory Information Notice, 7 March 2014, Appendix F, p52.

Type	Generator	Connection Point that the Generation is Embedded Within
Scheduled	Barcaldine	Lilyvale 132kV
Scheduled	Roma	Columboola 132kV
Scheduled	Yabulu	Yabulu connects into Ergon's meshed 66kV Townsville network, which is supplied by multiple Powerlink connection points. The Yabulu generation is apportioned between the connection points as follows, based on the degree to which Yabulu generation deloads the connection points, based on system normal conditions. 30% Garbutt 66kV 33% Dan Gleeson 66kV 13% Townsville East 66kV 24% Townsville South 66kV
Semi-Scheduled	Kidston Solar	Ross 132kV
Non-Scheduled	Barcaldine Solar Farm	Lilyvale 132kV
Non-Scheduled	Bromelton	Loganlea 110kV
Non-Scheduled	Daandine	Tangkam 110kV
Non-Scheduled	German Creek	Lilyvale 66kV
Non-Scheduled	Isis Sugar Mill	Teebar Creek 132kV
Non-Scheduled	Mackay	Mackay
Non-Scheduled	Moranbah	Moranbah 11kV
Non-Scheduled	Moranbah North	Moranbah 66kV
Non-Scheduled	Oakey Creek	Lilyvale 66kV
Non-Scheduled	Pioneer Mill	Clare South 66kV
Non-Scheduled	Racecourse Mill	Pioneer Valley 132kV
Non-Scheduled	Rocky Point	Loganlea 110kV
Non-Scheduled	Lakeland Solar	Turkinje 132kV

Weather Corrected MD 10% PoE

Weather correction is only applicable to DNSP connection points, as the large industrial and rail traction loads which connect directly to Powerlink's network are not materially weather-

sensitive. For large industrial and rail traction loads, the weather corrected values are the same as the non-weather corrected values.

For the coincident weather corrected maximum demand, Powerlink has applied the weather correction calculated for the *Weather corrected network coincident demand* (listed in Table 5.3.1) on a pro-rata basis to all DNSP connection points.

For the non-coincident weather corrected maximum demand, Powerlink has obtained from each DNSP their calculated temperature corrected values, as only the DNSPs have the detailed record of downstream outages and load transfers to robustly perform this calculation. Powerlink independently performed temperature corrections for each region within Queensland and ensured that the aggregate effect of the DNSP supplied corrections aligned with the regional assessment.

2018/19 Explanatory Note: At two connection points, the coincident weather-corrected value exceeds the corresponding non-coincident value. This is a consequence of the difference in the weather-correction process for coincident and non-coincident parameters:

- The coincident weather correction is calculated on the entire system load, using weighted-average weather across Queensland, and is applied uniformly across all weather sensitive loads in the system
- Non-coincident weather corrections are calculated particularly for each connection point, using local weather conditions.

In the situation where the weather was significantly abnormal at some connection points, but relatively-normal across Queensland as a whole, the non-coincident peak at those connection points may be subject to a significant negative correction while the correction to the coincident value may be relatively modest. This could result in the coincident figures exceeding the corresponding non-coincident figures.

For 10% PoE results, the statistical calculations were set to calculate the temperature correction corresponding to a 10% probability of exceedance.

Weather Corrected MD 50% PoE

This field was populated as per the *Weather Corrected MD 10% PoE*, except using adjusted statistical calculations to calculate the temperature correction corresponding to a 50% probability of exceedance.

2018/19 Explanatory Note: At four connection points, the coincident weather-corrected value exceeds the corresponding non-coincident value. This is a consequence of the difference in the weather-correction process for coincident and non-coincident parameters:

- The coincident weather correction is calculated on the entire system load, using weighted-average weather across Queensland, and is applied uniformly across all weather sensitive loads in the system
- Non-coincident weather corrections are calculated particularly for each connection point, using local weather conditions.

Newly commissioned/decommissioned connection points

New connection points are added to the bottom of Table 5.4.1 as new connection points are commissioned. For these new connection points no maximum demand data is available prior to their commissioning date. If the commissioning date occurs during a regulatory year but after the date of coincident maximum demand then no demand information will be available for that regulatory year for coincident maximum demand. Data for non-coincident maximum demand will still be available for that regulatory year.

In 2018/19 there were no new connection points commissioned.

As required by this RIN[30], Powerlink is required to notify instances where connection points have been decommissioned.

In 2018/19 there were no connection points decommissioned.

[30] Regulatory Information Notice, 7 March 2014, Clause 8.7

Appendix A

Reconciliation to Powerlink's Regulatory Financial Statements and Powerlink's Audited Statutory Accounts	

Prescribed transmission services capex (as incurred)	2018/19 $'000
Total Capex as per RIN Templates	**148,705**
Capitalised Corporate Overhead as per RIN Definition	**12,337**
Balancing Items	
- Capex "As Incurred" Project Adjustment	2,015
- Capex not Covered by RIN	2,835
- Post Commissioning Cost	1,893
Total Balancing Item	**6,743**
Total Capex - Table 2.1.1	**167,784**
Total Prescribed Capex - Powerlink's Regulatory Financial Statements	**167,784**
Capex - Non-Regulated and Negotiated	53,416
Total Adjusted for Non-Regulated and Negotiated Capex	**221,200**
Proceeds from MV Disposal included in Capex for Reg Acc	259
Total Capex - Powerlink's Audited Statutory Accounts	**221,459**

Reconciliation to Powerlink's Regulatory Financial Statements and Powerlink's Audited Statutory Accounts	

Prescribed transmission services opex by category	2018/19 $'000
Total Opex as per RIN Templates 2.6.1, 2.7.2, 2.8.2, 2.10.1, 2.10.2	**246,149**
Balancing Items	
- Capitalised Corporate Overhead as per RIN Definition	-15,512
- Adjustment for Template 2.6 Double Counting as per RIN Requirement	-32,103
Total Balancing Item	**-47,616**
Total Opex - Table 2.1.2	**198,534**
Total Prescribed OPEX - Powerlink's Regulatory Financial Statements	**198,534**
OPEX - Non-Regulated and Negotiated	35,760
Total Adjusted for Negotiated/Non-Regulated Opex	**234,294**
Total Opex - Powerlink's Audited Statutory Accounts	**234,294**

Appendix B


Vegetation Maintenance Built Sections
Legend
Population Centre
Vegetation Zones
Rural
Tropical
Urban
Cairns
Townsville
Mackay
Rockhampton
Gladstone
Bundaberg
Roma
Brisbane
Coordinate System
Horizontal: MGA Zone 55, GDA 94
7 MAY 2014
0 50 100 150 200
Kilometres

References

AS 2374.7 -1997, Power Transformers, Part 7: Loading Guide for Oil-Immersed Power Transformers.

Australian Energy Market Commission, National Electricity Rules, Version124, August 2019.

Australian Energy Regulator (2012). Final Decision, Powerlink Transmission Determination 2012/13 to 2016/17.

Australian Energy Regulator (2017), Final Decision, Powerlink Transmission Determination 2017-22 Regulatory Period.

Australian Energy Regulator (2015). Final Decision – Electricity Transmission Network Service Providers Service Target Performance Incentive Scheme, September.

Australian Energy Regulator (2014a).Category Analysis Regulatory Information Notice.

Australian Energy Regulator (2014b). Explanatory Statement, Final Regulatory Information Notices to Collect Information for Category Analysis.

Bureau of Meteorology: www.bom.gov.au

Emails from the AER: Final category analysis RINs – Issues Register – 010414_1157.xlxs

Powerlink, Annual Planning Report 2019.

Powerlink, Financial Statements 2018/19.

Powerlink, Cost Allocation Methodology, V2, AER approved, 15 August 2008.