Asset Management – Distribution Annual Planning Report 2025

22 December 2025

Essential Energy

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Table of Contents

List of Figures

List of Tables

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EXECUTIVE SUMMARY

Since 1 January 2013, the National Electricity Rules (NER) have stated that all Distribution Network Service Providers (DNSPs) operating in the National Electricity Market (NEM) are required to:

- Conduct an annual planning review and publish a Distribution Annual Planning Report (DAPR)
- Conduct economic assessments of potential project options under a new Regulatory Investment Test for Distribution (RIT-D)
- Implement a Demand Side Engagement Strategy to consult with and engage non-network providers in the development and evaluation of potential solutions to identified network needs.

The annual planning review includes the planning for all assets and activities carried out by Essential Energy that would materially affect the performance of its network. This includes planning activities associated with the replacement and refurbishment of assets and negotiated services. The objective of the annual planning review is to enable DNSPs to plan for and adequately address possible future issues in a timely manner. The outcome of the annual planning review is the DAPR.

Essential Energy is required to prepare and publish a DAPR that is compliant with the requirements of the NER (Section 5.13.2 and Schedule 5.8) to:

- Provide transparency to Essential Energy's decision-making processes and provide a level playing field for all regions in the NEM in terms of attracting investment and promoting efficient decisions
- Set out the results of Essential Energy's annual planning review, including joint planning, covering a minimum five year forward planning period for distribution assets
- Inform registered participants and interested parties on the annual planning review outcomes - report on capacity and load forecasts for sub-transmission lines, zone substations and transmission-distribution connection points, plus, where they have been identified, any primary distribution feeders which were overloaded or forecast to be overloaded within the next two years
- Provide information on Essential Energy's demand management activities and actions taken to promote non-network initiatives each year, and plans for demand management and embedded generation over the forward planning period
- Assist non-network providers, Transmission Network Service Providers (TNSPs), DNSPs and connection applicants to make efficient investment decisions.

The DAPR covers a minimum five year forward planning period for distribution network assets.

REVISION HISTORY

V1 – Issued December 2025

- Initial Release

1. INTRODUCTION

1.1 About Essential Energy

Essential Energy's purpose is 'enabling energy solutions that improve life', with a vision to be 'empowering communities to share and use energy for a better tomorrow'.

The organisation builds, operates and maintains one of Australia's largest electricity networks, across 95 per cent of New South Wales (NSW) and parts of southern Queensland. Serving more than 900,000 customers – including homes, hospitals, schools, businesses, and community services – Essential Energy is an economic enabler for regional, rural, and remote communities.

Essential Energy aims to continuously improve safety performance for employees, contractors, and the community, along with the reliability, security, and cost efficiency of the network, while striving to maintain downward pressure on the network component of customers' electricity bills and deliver an acceptable Return on Capital Employed.

Essential Energy's business objectives are:

- Continuous improvements in safety culture and performance
- Operate at industry best practice for efficiency, delivering best value for customers
- Deliver real reductions in customers' distribution network charges
- Deliver a satisfactory Return on Capital Employed
- Reduce the environmental impact of Essential Energy where it is efficient to do so.

These will be achieved through enhanced customer engagement; investing in best practice systems, processes and technology; improving commercial capabilities to enable the business to operate safely and efficiently; and taking a more holistic approach to the sustainability of our operations.

Essential Energy's network area is divided into ten operations areas encompassing a wide range of geographical, climatic, and environmental conditions.

In the Far West of NSW, an operating division, Essential Water, services a population of approximately 18,000 people. A secure water supply is delivered to around 10,500 customers in Broken Hill, Sunset Strip, Menindee, and Silverton, as well as rural customers. Reliable sewerage services are provided to around 9,700 customers in Broken Hill. Essential Water operates a network of dams, water treatment plants, sewage treatment plants, reservoirs, water, and sewage pumping stations, mains, and other related infrastructure.

Intium, a wholly owned commercial subsidiary of Essential Energy, was incorporated in January 2023, to provide innovative energy solutions that support Australia's transition to net zero. Intium focuses on business-to-business customers across Australia that need innovative energy solutions, including businesses pursuing emerging and complex energy services.

1.1.1 OPERATING ENVIRONMENT

Essential Energy is a NSW Statutory State Owned Corporation and Energy Services Corporation, regulated by state and national statutory and legislative requirements. In addition to being subject to specific electricity distribution laws and rules, Essential Energy is subject to most of the statutory and other legal requirements that other businesses are subject to, including workplace health and safety (WHS), environmental, competition, industrial, consumer protection and information laws. Essential Energy is also required to follow government and regulatory direction.

At a national level, Essential Energy is subject to the National Electricity Law (NEL) and the National Electricity Rules (NER) which regulate the National Electricity Market (NEM). Essential Energy operates in the NEM as a Distribution Network Service Provider (DNSP). The Australian Energy Regulator (AER) regulates the transmission and distribution sectors of the NEM under the NEL and NER.

At a state level, Essential Energy's activities are governed by the NSW Electricity Supply Act 1995, the Energy Services Corporations Act 1995 and a NSW Distribution Network Service Provider licence. The Independent Pricing and Regulatory Tribunal (IPART) is responsible for monitoring compliance with licence conditions.

Essential Energy ensures compliance with these laws and regulations through its internal codes and policies and a common control framework, which comprises plans, policies, procedures, delegations, instruction and training, audits of compliance and risk management. Operations are guided by policies and codes, including Health, Safety and Environment Policy, Statement of Business Ethics, and Code of Conduct.

The constitution of Intium Pty Ltd was tabled in NSW Parliament in November 2023. Under the Corporations Act 2001 (Cth), and in accordance with Intium Pty Ltd's Constitution, all decisions relating to the operation of Intium are to be made by or under the authority of its Board.

1.1.2 ESSENTIAL ENERGY STATISTICS

Table 1: Essential Energy Statistics for 2024/25

CATEGORY	NUMBER AT 30/6/2025
Distribution Customer Numbers (Total)	902,281
Customer Numbers (Coastal)	120,651
Customer Numbers (Border Rivers)	67,100
Customer Numbers (Mid North Coast)	181,077
Customer Numbers (Namoi)	75,299
Customer Numbers (North Western)	44,112
Customer Numbers (Central Tablelands)	87,019
Customer Numbers (Riverina Slopes)	69,668
Customer Numbers (South Eastern)	125,129
Customer Numbers (Murray)	82,947
Customer Numbers (Central)	49,279
Maximum Demand (MW)	2,473
Feeder Number CBD	0
Feeder Number Urban	270
Feeder Number Short Rural	960
Feeder Numbers Long Rural	245
Energy Received by Distribution Network to Year End GWh	13,636
Energy Distributed (Residential) GWh	4,673
Energy Distributed (Non-Residential including un-metered supplies) GWh	8,280
Energy Distributed (Coastal) GWh	846
Energy Distributed (Border Rivers) GWh	989
Energy Distributed (Mid North Coast) GWh	1,463
Energy Distributed (Namoi) GWh	1,083
Energy Distributed (North Western) GWh	997
Energy Distributed (Central Tablelands) GWh	3,107
Energy Distributed (Riverina Slopes) GWh	1,274
Energy Distributed (South Eastern) GWh	1,197

CATEGORY	NUMBER AT 30/6/2025
Energy Distributed (Murray) GWh	1,266
Energy Distributed (Central) GWh	1,414
System Loss Factor (%)	5.01
Substation - Zone (Number)[1]	340
Substation - Distribution (Number)	144,128
High Voltage Overhead (km)	157,777
High Voltage Underground (km)	3,274
Low Voltage Overhead (km)[2]	24,956
Low Voltage Underground (km)	7,898
Pole (Number)[3]	1,333,482
Streetlights (Number)	167,363

Notes: Distances for overhead and underground lines are circuit km.

[1] The number of zone substations reported include only those sites where the forecast is published within this document.

[2] LV Services and Streetlight circuits excluded, LV Services classification only includes the last span from the pole to the Point of Attachment, and no longer includes the road crossing section.

[3] This number is the sum of urban, short rural and long rural poles published in the annual RIN.

1.2 Essential Energy's Network

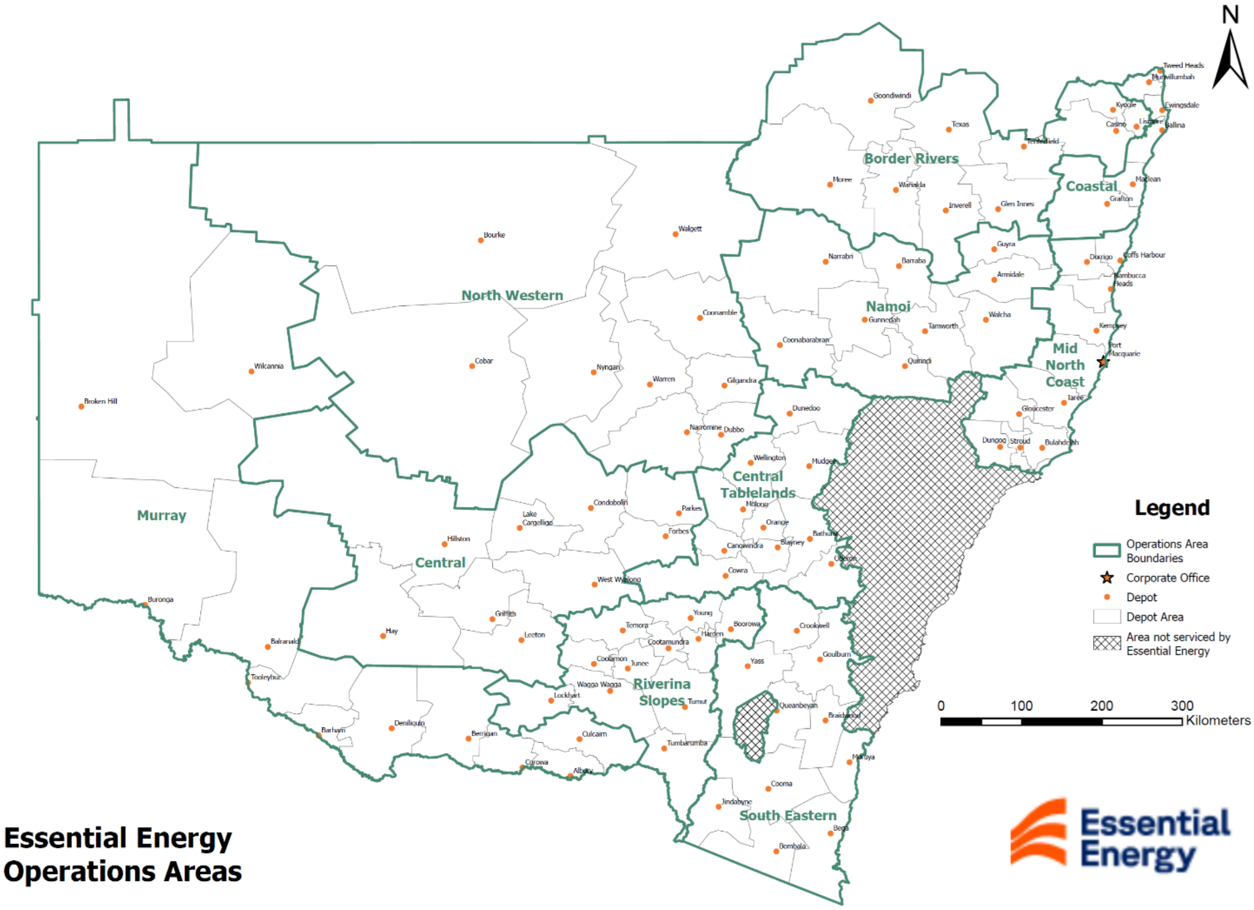


Figure 1: Essential Energy's Network Area

Essential Energy's network includes around 183,000km of overhead powerlines traversing 737,000 square kilometres of landmass. The network has a large number of asset types across different voltage levels. Customers can be connected at any voltage level from 220,000 volts down to low voltage (400/230 volts), depending on their power needs. Figure 2 illustrates the variety of network components owned by Essential Energy, with shaded portions showing examples of connected customers and bulk supply points not owned by Essential Energy – the distribution network is one component of an integrated system by which electricity is generated, transmitted and distributed to customers.

The majority of costs associated with electricity distribution are not driven by the number of customers or their demand on the network. Rather, network costs are driven by the number of assets required to deliver electricity to each customer. Whether there are 50 customers connected to one pole or 50 poles connecting one customer, each asset needs to be inspected, safely maintained and replaced at the end of its life.

1.2.1 NUMBER AND TYPES OF DISTRIBUTION ASSETS

Essential Energy's network consists of around 183,000km of overhead sub-transmission, high voltage distribution and low voltage distribution power lines, 11,000km of underground cables and 1.4 million poles. Approximately 95 per cent of the network is of an overhead construction type and 95 per cent of distribution substations are pole-mounted due to the predominately rural nature of the network.

The majority of the distribution network is radial, with most parts supplied from one source. This provides little opportunity for interconnection with other circuits for security and supply continuity when performing maintenance activities or in the event of unplanned outages. This is equally true of the radial 132,000 volt and 66,000 volt sub-transmission networks.

Essential Energy reviews the level of reliability received by our customers against the nationally defined Value of Customer Reliability (VCR) and ensures that the level of network investment is in line with this measure of customer expectation. This approach does limit the level of reliability able to be delivered to our remote customers, primarily due to the level of investment required. Essential Energy is, however, committed to continually reviewing the reliability of its network in all parts of its supply area. Where suitable, Essential Energy will aim to utilise available technologies and appropriate practices to provide the maximum reliability and security of supply possible within these constraints.

Table 2: Network Assets as at 30 June 2025

ASSETS	CIRCUIT KILOMETRES		TRANSFORMERS	
	OVERHEAD LINES	UNDERGROUND CABLES	NUMBER	NOMINAL CAPACITY (MVA)
220kV	2.98	0	0	0
132kV	2,191.85	15.17	83	3,258.00
110kV	21.01	0	3	300.00
66kV	7,532.79	38.51	408	5,925.04
33kV	5,422.73	52.41	1,607	1,716.20
22kV	42,553.02	432.60	35,434	2,594.26
11kV and below	70,426.21	2,695.32	98,557	7,979.80
SWER (all voltages)	29,626.27	40.25	8,686	164.38
Low voltages	24,955.58	7,897.87	0	0
Total network	182,732.44	11,172.13	144,778	21,937.68

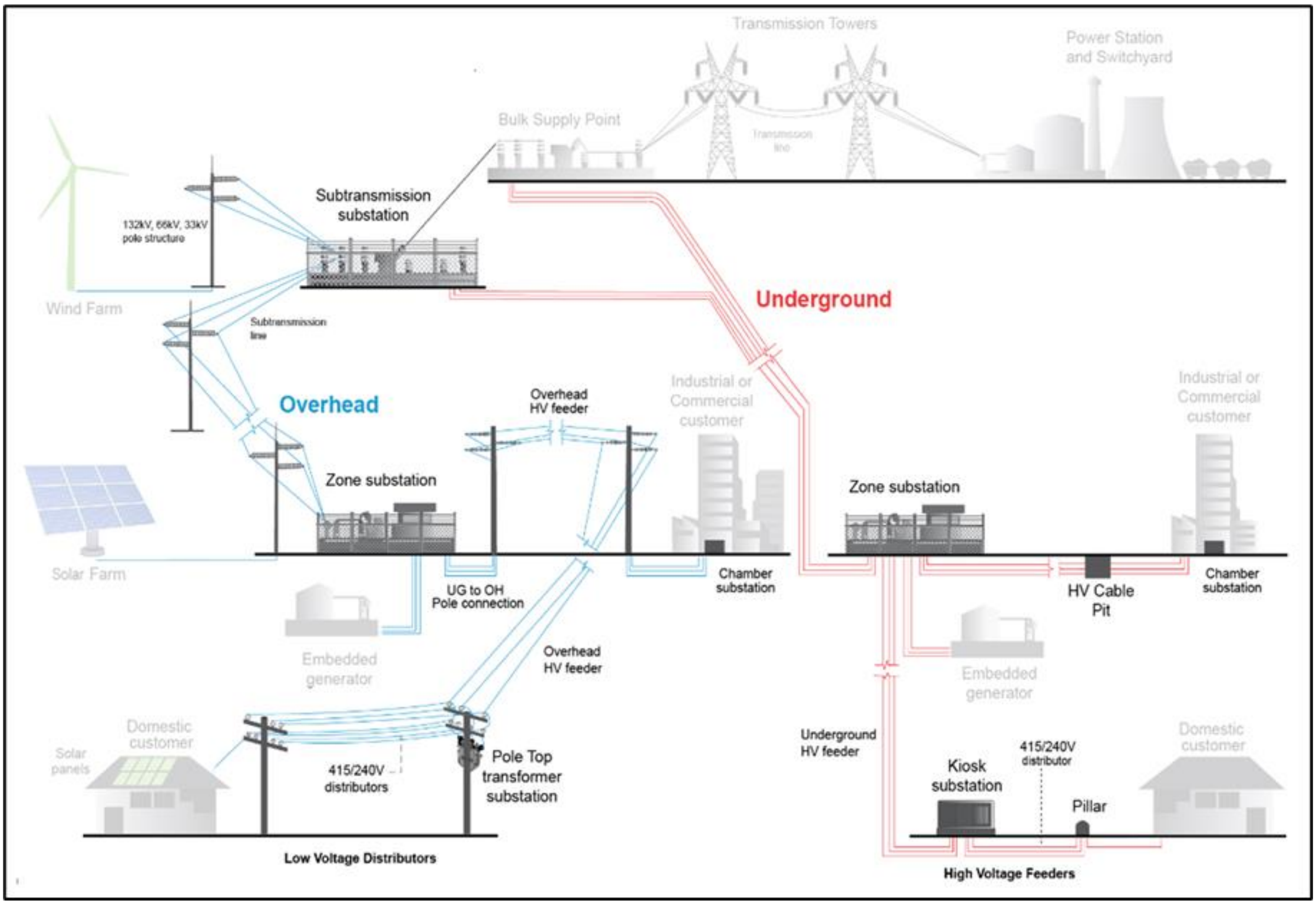


Figure 2: Typical components of Essential Energy's electricity network

1.3 Annual Planning Review

The NER require that the Annual Planning Review includes the planning for all assets and activities carried out by Essential Energy that would materially affect the performance of its network. This includes planning activities associated with the replacement and refurbishment of assets and negotiated services. The objective of the Annual Planning Review is to identify possible future issues that could adversely impact the performance of the distribution network to enable DNSPs to plan for and adequately address such issues in a timely manner. The outcome of the Annual Planning Review is the DAPR.

This DAPR provides information to Registered Participants and interested parties on the nature and location of emerging constraints on Essential Energy's sub-transmission and high voltage distribution network assets, commonly referred to as the Distribution Network. The timely identification and publication of emerging network constraints allows the market to identify potential non-network solutions and Essential Energy to develop and implement appropriate and timely solutions to them.

The DAPR document is supplemented by three data attachments which can be found on Essential Energy's website[4]

- DAPR 2025 BSP, ZS and Lines Extract Summary.xlsx
- DAPR 2025 Limitations Annual Data Essential Energy.xlsx
- DAPR 2025 Limitations Load Trace Essential Energy.xlsx

The 2025 DAPR can be visualised through the website https://dapr.essentialenergy.com.au/. This site contains an interactive map of the network, including forecasts, limitations, and planned investments. All published forecasts are POE50 (probability of exceedance of 50 per cent).

1.3.1 NETWORK PLANNING PROCESS

The planning and development process for the distribution network is carried out in accordance with the NER Chapter 5 Part D Planning and Expansion.

Essential Energy carries out network planning at both a strategic and project level. The processes used for each of these levels of network planning are set out in the Essential Energy procedural guideline "Sub-transmission and Distribution Network Planning Criteria and Guidelines", housed and administered through Essential Energy's Business Management System.

The Essential Energy investment governance process ensures continuous review and assurance that capital prudence and efficiency are being achieved, as well as being consistently aligned with longer term strategic planning as set out within the Essential Energy Corporate Objectives, Strategic Business Plans and Strategic Asset Management Plan (SAMP).

The Essential Energy network planning process uses a quantified approach to monetise the value of risk for Network Constraints and a value-based approach to identify the most effective ways to minimise risk, while delivering benefit to network users.

The first stage of the network planning process involves researching the data required to assess all constraints and assemble a whole-of-network view. This includes historical and existing peak demands, the preparation of a range of seasonal demand forecasts, examining network capacity limits, assessing asset condition and

[4] https://www.essentialenergy.com.au/our-network/network-pricing-and-regulatory-reporting/regulatory-reports-and-network-information

risk of failure, forecasting new customer connections (including new or augmented 'spot' loads and/or embedded generators) and taking into account duty of care and regulatory obligations.

The forecast adequacy of the network is assessed against key criteria, including:

- Meeting modern infrastructure standards, including safety and security of the network and environmental compliance
- Addressing any 'demand – capacity' imbalance
- Risk, reliability, and power quality performance
- Asset condition and re-investment considerations
- Customer connection requirements (loads and embedded generation).

When emerging network limitations are identified and quantified according to Essential Energy Asset Risk Management and Appraisal Value Frameworks, a range of feasible options, including both network and non-network solutions, are developed to address the network need and to ensure continuing compliance.

All relevant potential credible options, including non-network and operational alternatives are considered in determining how to best meet network performance obligations and the objectives of the NEL.

There is a robust selection process based on analysis of the Net Present Value of options and a range of sensitivity analyses that explicitly trade off alternative investment options. These options use quantified estimates for credible option costs and market benefits against business performance targets to identify the optimum portfolio of projects that minimises the risk and cost of achieving the desired performance.

In accordance with NER obligations and statutory requirements, network augmentation and demand management options are assessed impartially using a consistent value-based review process. Demand management and non-network options are evaluated on the extent to which they can avoid or defer the need for traditional network augmentation.

This DAPR seeks to inform stakeholders and provides advice on emerging network limitations and network adequacy. It also provides details of the expected time required to allow appropriate corrective network augmentation, non-network alternatives or modifications to connection facilities.

The Essential Energy network planning approach is outlined in its Network Management Plan and is consistent with the principles of the NSW Government Total Asset Management framework.

Essential Energy is required to comply with mandatory service standards in accordance with the Reliability and Performance Licence Conditions for Electricity Distributors (July 2014) and subsequent variations. This document provides information for locations where investment is required to address network limitations due to forecast demand and other prudent considerations.

1.4 Significant changes from previous DAPR

The 2025 DAPR follows the same structure as previous years, with many of the changes being related to network configuration and forecasting methodology improvements. The content has been improved based on feedback from various stakeholders including the AER. There have been changes to Operational Area names and boundaries which impacts some reporting of supplied areas.

1.4.1 ANALYSIS AND EXPLANATION OF FORECAST CHANGES

Average temperatures across both summer and winter were slightly above recent years, leading to the the network-wide peak demand being nearly equal across the two seasons, with winter marginally higher.

Individual site forecasts continue to show low steady growth on average, though the continued impacts from previous events such as drought, bushfires and floods have affected some sites where it is unclear what the long-term effects of these events will be.

As site data and the forecasting process is improved, the quality of each forecast is also improving. At all levels from Transmission-Distribution Connection Points to the sub-transmission and zone substation level, forecasts have been adjusted to account for expected load transfers for new and decommissioned sites.

The forecasting process is constantly evolving, particularly as new and / or developing characteristics are identified on the network that impact demand. A summary of the current forecasting methodology is described in further detail in Section 2.2.

1.4.2 ANALYSIS AND EXPLANATION OF CHANGES IN OTHER INFORMATION

The main focus for this document was data quality improvements and adjustments to the forecasting methodology, so the majority of sections within the document contain only minor changes.

2. FORECASTS FOR THE FORWARD PLANNING PERIOD

This section provides a detailed assessment of the current peak demand forecast process.

Peak demand forecasts provide Essential Energy with the basis for identifying network limitations, evaluating the credible network and non-network options to address those limitations and (if applicable) commencing the RIT-D process. It also feeds into the SAMP and identification of the capital and operating investment expected to be required for the forward planning period.

Essential Energy's Network System peak demand for the Summer 2024/25 and Winter 2025 periods peaked in Winter at 2,448 megawatts (MW) at 6:30pm (AEST) on Monday, 30 June 2025.

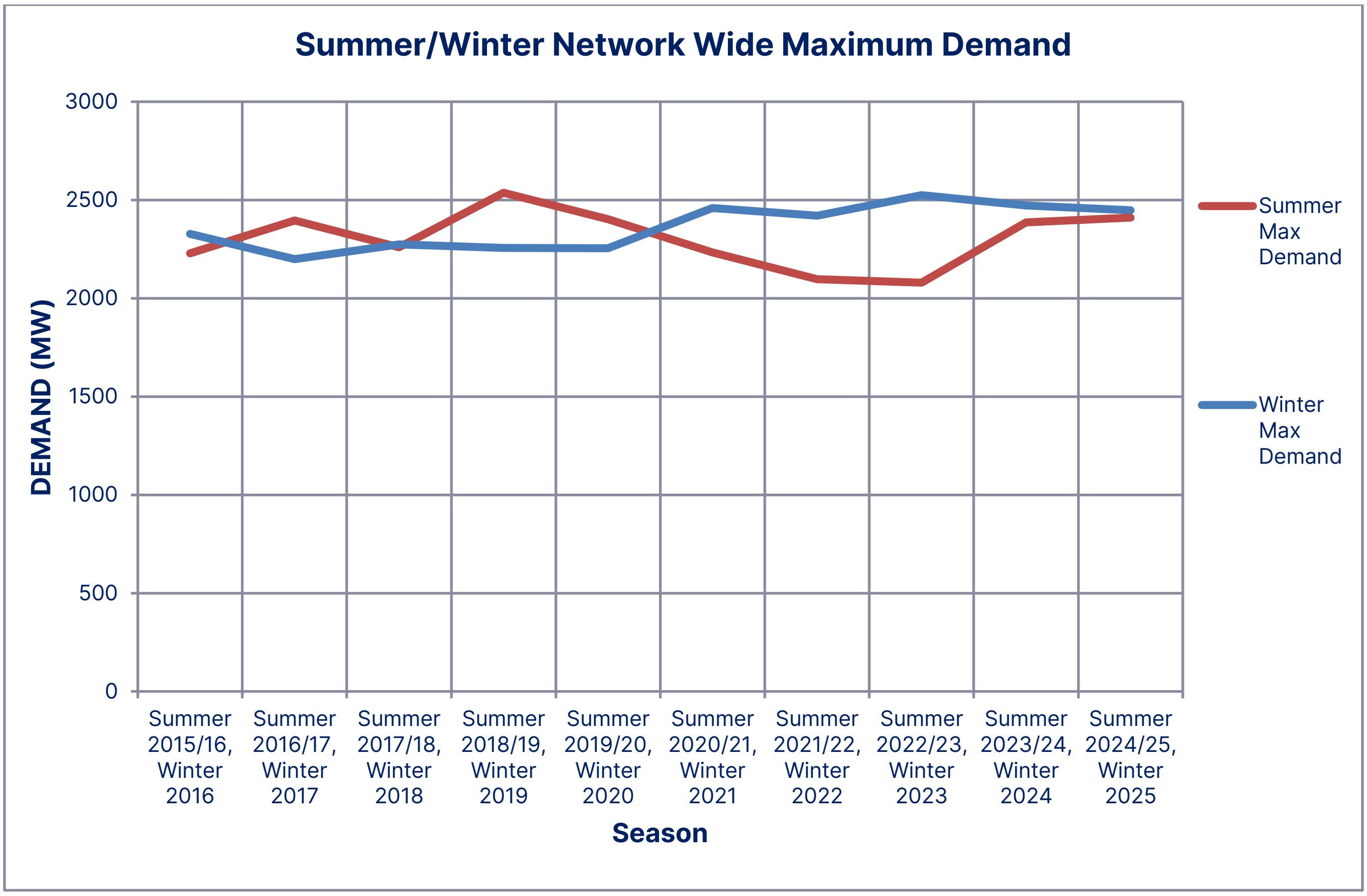


Figure 3: Essential Energy's recorded maximum demands

2.1 Load Forecasting Strategy

A primary driver in network development and the identification of specific investments is the forecast of electricity demand and energy. The spatial demand forecast is a critical process that supports planning, development of the capital program and the regulatory submission.

Given the importance of the demand forecast on the required capital expenditure and the SAMP, Essential Energy's main objectives are:

- Efficient, closed-loop development and refinement of the forecasting process, data, and documentation
- Engagement of the wider audience to appropriately inform the impacts and building blocks of demand.

In the process of moving towards achieving these objectives, Essential Energy has seen a substantial transition in the network forecasting methodology and process from a relatively simplistic process (such as minimal weather correction and reconciliation between top-down and bottom-up forecasts) which required a high level of subjectivity to a more complex, repeatable process using concepts from the AEMO connection point forecasting methodology.

2.2 Load Forecasting Methodology and Process

The forecasting methodology has been developed and refined using two main vision items as the driving force, these items are:

- That the demand forecasting process undertaken is commensurate with the benefits the forecast provides
- That all demand forecasts are auditable and repeatable.

Essential Energy has developed a methodology which provides for the establishment of the building blocks required to achieve this vision. This methodology is summarised in Figure 4.

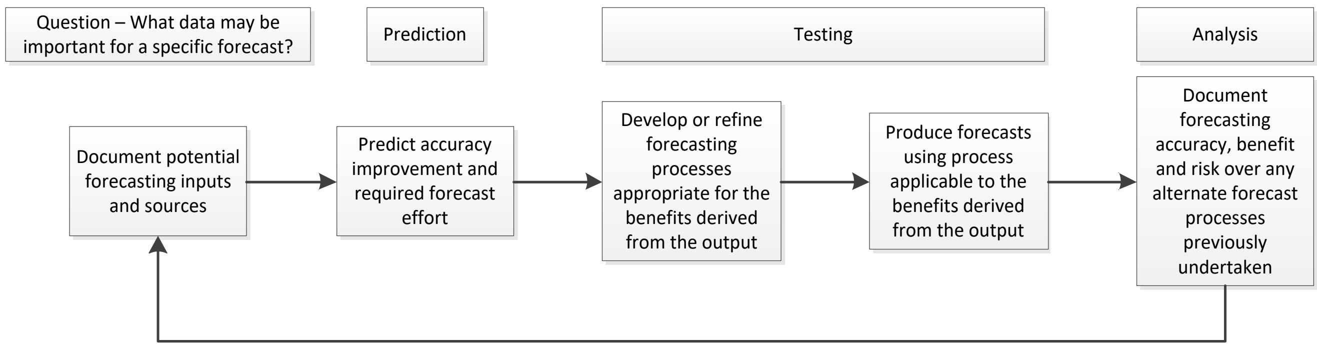


Figure 4: Forecasting Methodology

As shown in Figure 4, Essential Energy's methodology calls for continuous improvement in the forecasting process specific to the site in question and dependent on the predicted cost/benefit. As an example, some sites may have poor input data and hence poor forecasting accuracy, however if no benefits can be identified from improving the forecast, the cost to improve the process cannot be justified and the forecast inaccuracy specific to the site in question will remain. Alternatively, high benefits (such as capital deferral) would justify substantial forecasting effort and the appropriate level of expense and rigour.

To assist in the network planning process and to identify regional growth patterns, several levels of forecast are used by Essential Energy:

- Overall Essential Energy network forecast
- Regional Transgrid and other TNSP connection point forecasts
- Sub-transmission feeder forecasts
- Zone substation forecasts
- Local distribution feeder forecasts as necessary.

The forecasting process used by Essential Energy is heavily influenced by the Australian Energy Market Operators' (AEMOs) published Connection Point Forecasting Methodology[5].

At a high level, the process consists of:

- Data collection and collation

To cater for regional and local needs, a forecast of the demand at each zone substation is developed based on historical demands and information provided by major customers. Account is taken of load diversity between connection points. Embedded generation is recognised and included in the forecast where it offers firm capacity at the time of demand.

- Outlier removal / Data preparation

To ensure only system normal conditions are evaluated, short-term network switching, and abnormal metering outputs are removed.

- Weather correction (or normalisation)

Historical demand is weather corrected to provide a reference set of conditions from which each year can be compared (with a probability of exceedance of 50 per cent). Daily temperatures and solar irradiance from relevant weather stations covering the last thirty (30) years are used in the correction to account for various forms of weather behaviour.

- Repeat for each season over the time periods available

The forecast covers both summer and winter demands and uses data going back up to ten (10) years.

- Determine the most applicable growth rate based on known variables

A series of short and long-term trends in the ten years of weather-corrected historical demand is analysed and growth rate selected based on the median of such trends. Where the median does not accurately reflect a sites' growth (e.g., significant changes in historical configuration, customer mix, etc) an alternative growth rate is selected to reflect the current status of the site. In some cases, it may be necessary to remove certain time periods from the analysis where configuration changes have been deemed to significantly impact the trend analysis.

- Determine starting point of forecasts

Forecasts generated from weather-corrected and raw history trends, plus results from autoregressive time series models are compared and the most suitable model is chosen as the starting point of each sites' forecast. Where all models generate poor results (e.g. because of small dataset, major configuration changes, etc) then the starting point is taken to be either the most recent historical seasonal maximum demand or overall average maximum demand, whichever is more suitable.

- Calculate forecast load

The forecast extends over a planning horizon of ten years, with the first five years published in this report. The forecast power factor used is the median of the forecast power factor distribution derived from the estimated relationship between active and reactive power components at the time of maximum demand.

- Apply any post model adjustments

[5] Australian Energy Market Operator – AEMO Connection Point Forecasting Methodology – Forecasting Maximum Electricity Demand in the National Electricity Market 29 July 2016

Where there is known potential for the connection of major spot load developments, such as mining loads and major subdivisions, the forecast considers any reasonably firm step load increases in the medium term.

- Reconciliation of forecasts

Calculations are undertaken to ensure each forecast aligns with upstream and downstream network components, as well as identification of changes to previously developed forecasts.

2.2.1 SOURCES OF LOAD FORECASTING INPUT INFORMATION

Potential inputs to an individual forecast and the applicable source data may include:

Table 3: Potential Forecast Inputs

POTENTIAL INPUTS	POTENTIAL SOURCE DATA
Historic demands	Interval meter data, supervisory control and data acquisition (SCADA) data, recloser data, derived loads, assumed factors
Seasonal indicators	Seasonal trends
Future step loads (large customer or residential subdivision)	Information from network planning and major connections
Residential growth rates	Department of Planning
Economic conditions	Australian Bureau of Statistics
Weather patterns	Bureau of Meteorology
Generation	Interval meter data, Bureau of Meteorology, customer information
Individual customer demands	Interval meter data
Regulatory variation	AER documentation, Minimum Energy Performance Standards (MEPS) reports, other government initiatives
Distribution changes	Network information (planning, operations, load control)
Distribution programs	Network program information (planning, load control)
Tariff changes	Network Tariff information
Residential Solar Generation	Solcast estimates from measured solar irradiance
Electric Vehicle Charging	Interval meter data, historic registrations, forecasts of new car sales, connection applications, government incentives / pledges

2.2.2 ASSUMPTIONS APPLIED TO LOAD FORECASTS

Numerous assumptions are required to streamline the forecasting process. Some of these assumptions are that:

- All large customers and embedded generators are recorded appropriately
- Historic demand data used for summer forecasts comprise the high temperature days from months November to March inclusive while winter forecasts consider the low temperature days from months May to September
- All load information is actual (i.e., no erroneous readings, metering drift, etc)
- All switching events are recorded or easily detected in analysis
- All weather-related data is actual
- The selected weather sites are the best currently available to Essential Energy for representation of the conditions at the load sites
- All historic network changes have been accounted for
- Information provided by large load customers and developers will come to fruition
- Sub-transmission feeder forecasts are a special case, using a proportion of the Bulk Supply point forecast rather than an actual forecast. Hence, sub-transmission forecasts may not reconcile to zone substation forecasts
- Site forecasts are performed individually. Deviations to combined upstream forecasts can easily occur due to individual peak demands occurring at different times.

2.3 Forecast use of Distribution Services by Distribution Connected Units

Forecasts of PV exports are included within the data attachments (DAPR 2025 BSP, ZS and Lines Extract Summary.xlsx) with sheet names ending in “Export”. This analysis is in response to an additional section in the NER rules as of 2022. The methodology will be further improved responding to both the learnings of each year and the addition of data as it becomes available. A summary of the methodology is given below:

- Smart meter export data over the last 12 months was collected and summarised to each relevant network site
- Historic yearly installed PV capacity was collected and summarised to each relevant network site
- A logistic growth model was fitted to the historic PV capacity data and forecasts generated based on this model and qualitative assumptions
- For each site, the maximum export value from the smart meter data was calculated
- Each PV capacity forecast yearly growth rate was then multiplied by the corresponding maximum exported value to obtain the PV export forecast
- The date and time of maximum export was used to find the power factor of the corresponding zone substation and connection point.

The following assumptions were made to streamline the process:

- The history of installed PV capacity includes areas that have export limits already imposed

- The forecast of PV capacity assumes continual positive growth (no "saturation"), at a reduced rate. This allows for both the natural increase of the ratio of PV to non-PV customers to be realised, while also allowing existing customers to replace older PV systems with larger ones over time.
- Scaling the maximum export value to each PV capacity growth rate was used as some of the energy from the smart meter export data is self-consumed, and the same ratio is assumed to continue in the forecasts
- Sites with large embedded generation connected were included and adjusted accordingly.

2.4 Supply Areas

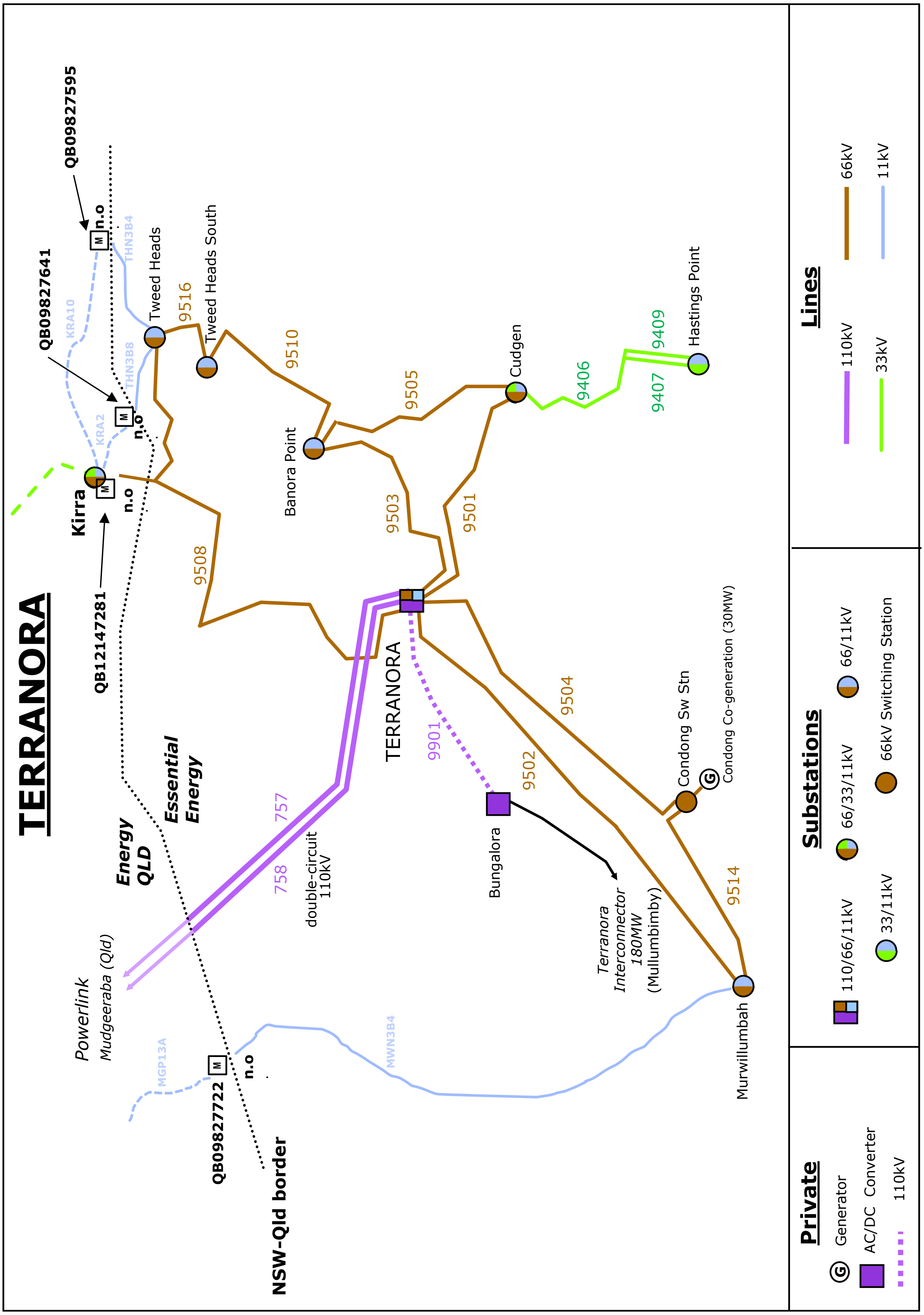
2.4.1 TERRANORA

All zone substations in the Terranora area are in the Coastal region.

The Terranora sub-transmission substation is owned by Essential Energy and is supplied from the Queensland transmission system via 2 x 110kV lines that are jointly owned by Essential Energy and Powerlink.

A high voltage direct current transmission network is connected between Mullumbimby and Terranora (via Bungalora) which allows supply to be either injected into the Lismore area from Terranora or injected into the Terranora area from Lismore.

A 30MW biomass generator is located at Condong and is connected to the Terranora 110/66kV sub-transmission substation at 66kV via feeders 9504, 9514 and 9502.


TERRANORA
Lines
110kV
66kV
33kV
11kV
Substations
110/66/11kV
66/33/11kV
66/11kV
33/11kV
66kV Switching Station
Private
Generator
AC/DC Converter
110kV
Kirra
Tweed Heads
Tweed Heads South
Banora Point
Cudgen
Hastings Point
TERRANORA
Bungalora
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Energy QLD
Essential Energy
NSW-Qld border
double-circuit 110kV
QB09827595
QB09827641
QB12147281
QB09827722
n.o
9516
9510
9505
9503
9501
9508
9504
9502
9514
9901
757
758
9406
9407
9409
KRA10
KRA2
THN3B4
THN3B8
MGP13A
MWN3B4
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G

2.4.2 LISMORE

Zone substations in the Lismore area are spread across both the Coastal and Border Rivers regions.

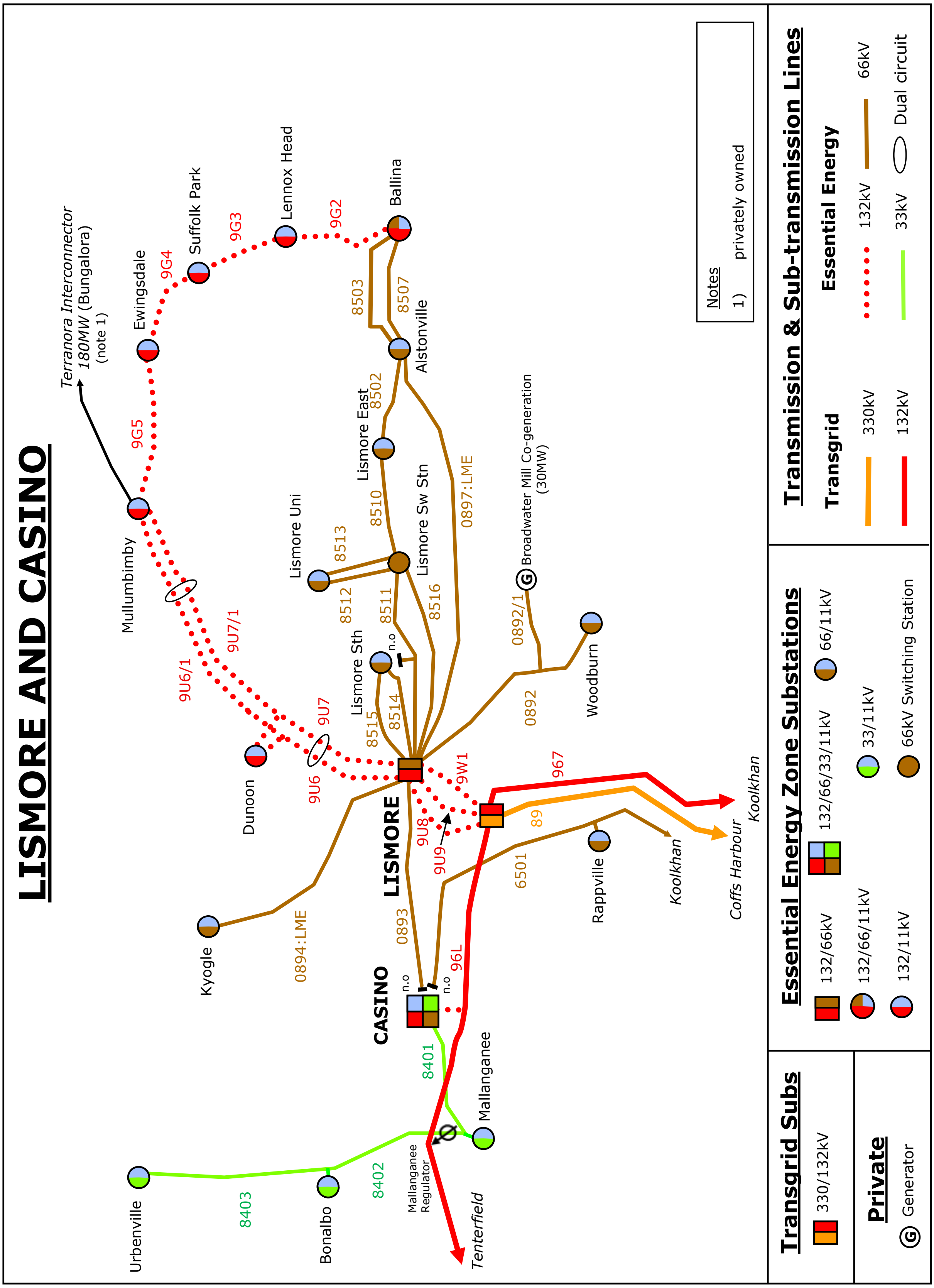
The Lismore 132/66kV sub-transmission substation is owned by Essential Energy. It receives its supply via three Essential Energy 132kV lines from the Transgrid 330/132kV sub-transmission substation at Lismore.

A high voltage direct current transmission network is connected between Mullumbimby and Terranora (via Bungalora) which allows supply to be either injected into the Lismore area from Terranora or injected into the Terranora area from Lismore.

A 30MW biomass generator is located at Broadwater and is connected to the Lismore 132/66kV sub-transmission substation at 66kV via feeder 0892.

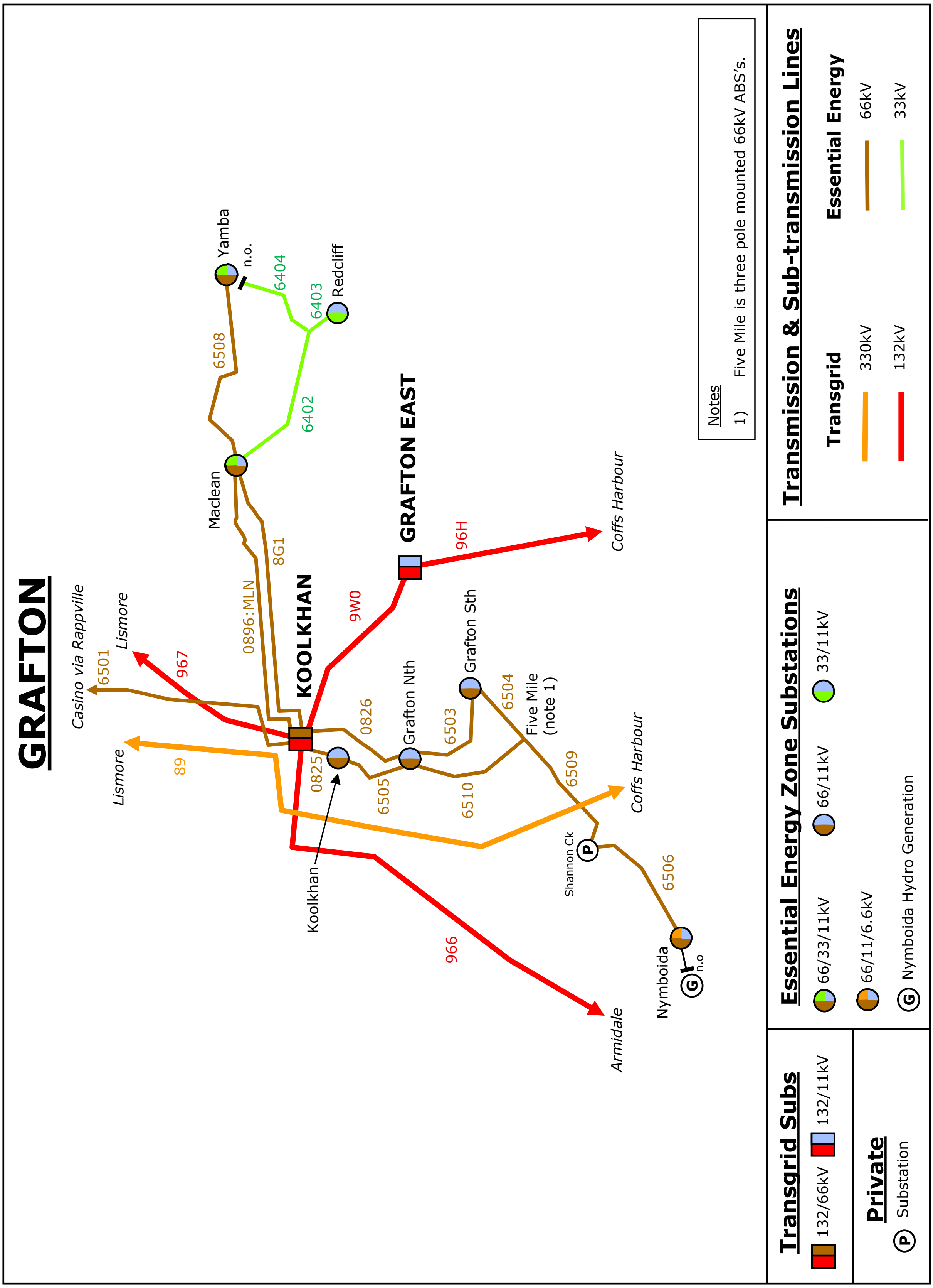
2.4.3 CASINO

The Casino area sub-transmission system is supplied from the Essential Energy 132/66kV sub-transmission substation at Casino which is teed off the Transgrid 132kV Tenterfield to Lismore line. On loss of the single 132/66kV transformer, 66kV supply reverts to Lismore 132/66kV substation via the Lismore – Casino 66kV line (0893).


LISMORE AND CASINO
Terranora Interconnector
180MW (Bungalora)
(note 1)
Mullumbimby
Ewingsdale
Suffolk Park
Lennox Head
Ballina
Alstonville
Lismore East
Lismore Uni
Lismore Sw Stn
Lismore Sth
Broadwater Mill Co-generation
(30MW)
Woodburn
Dunoon
LISMORE
Kyogle
CASINO
Rappville
Koolkhan
Coffs Harbour
Koolkhan
Mallanganee
Mallanganee
Regulator
Urbenville
Bonalbo
Tenterfield
9G5
9G4
9G3
9G2
9U6/1
9U7/1
9U7
9U6
9W1
9U8
9U9
96L
967
89
8503
8507
8502
8510
8513
8512
8511
8516
8514
8515
0897:LME
0892/1
0892
0893
0894:LME
6501
8401
8402
8403
n.o
n.o
n.o
Notes
1) privately owned
Transgrid Subs
330/132kV
Private
Generator
Essential Energy Zone Substations
132/66kV
132/66/11kV
132/11kV
132/66/33/11kV
33/11kV
66/11kV
66kV Switching Station
Transmission & Sub-transmission Lines
Transgrid
330kV
132kV
Essential Energy
132kV
33kV
66kV
Dual circuit

2.4.4 GRAFTON

All zone substations in the Grafton area are in the Coastal region. The Grafton area sub-transmission system is supplied from the Transgrid 132/66kV sub-transmission substation at Koolkhan.



2.4.5 COFFS HARBOUR

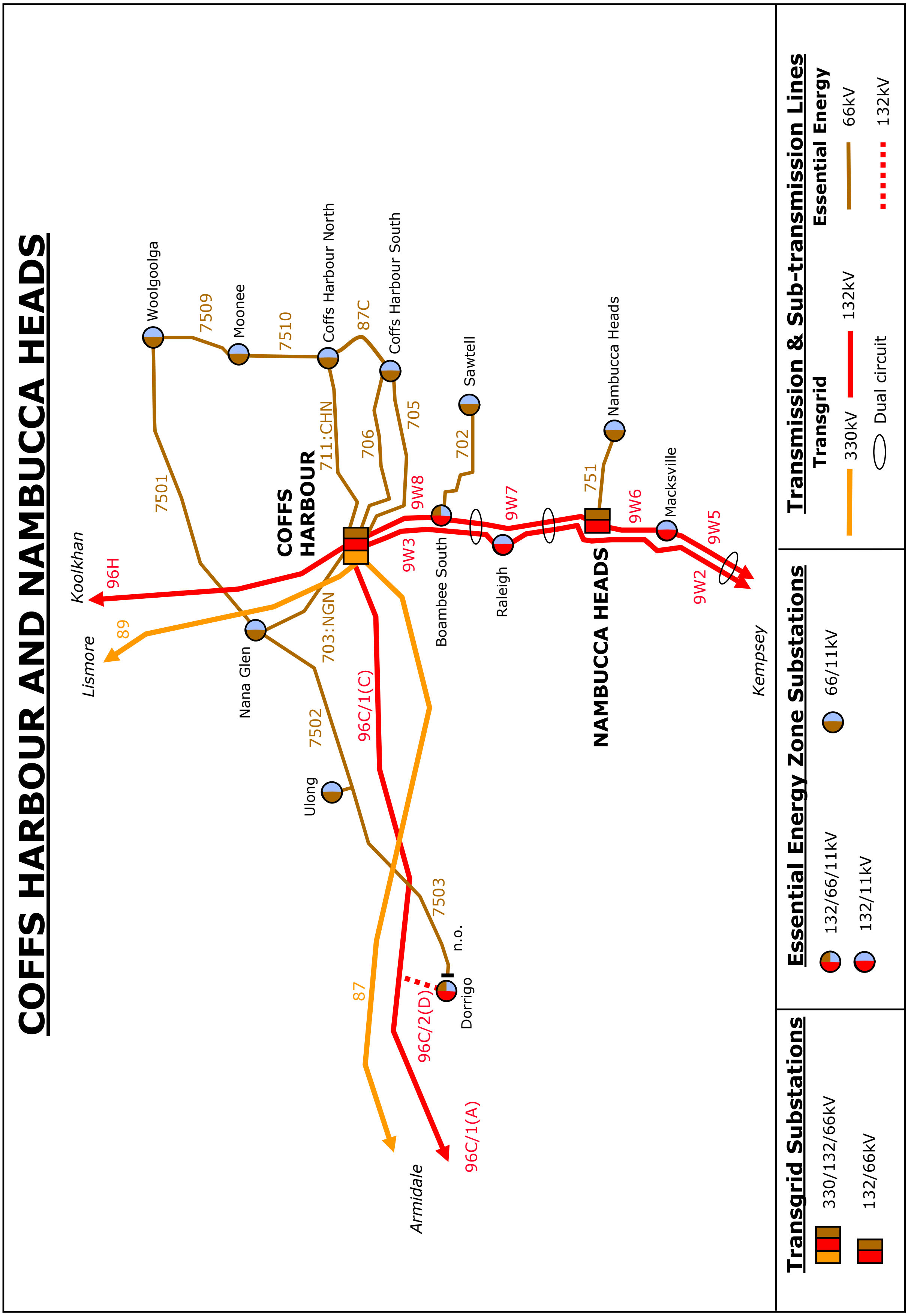
All zone substations in the Coffs Harbour area are in the Mid North Coast region.

The Coffs Harbour area sub-transmission system is supplied from the Transgrid 330/132/66kV sub-transmission substation at Coffs Harbour (Karangi). The Dorrigo substation is normally connected via the Essential Energy 132kV tee line from the Transgrid 132kV transmission line between Armidale and Coffs Harbour with back up from the 66kV system. Boambee South is an Essential Energy 132/66/11kV zone substation that is supplied by the Transgrid 132kV transmission network between Kempsey and Coffs Harbour.

2.4.6 NAMBUCCA HEADS

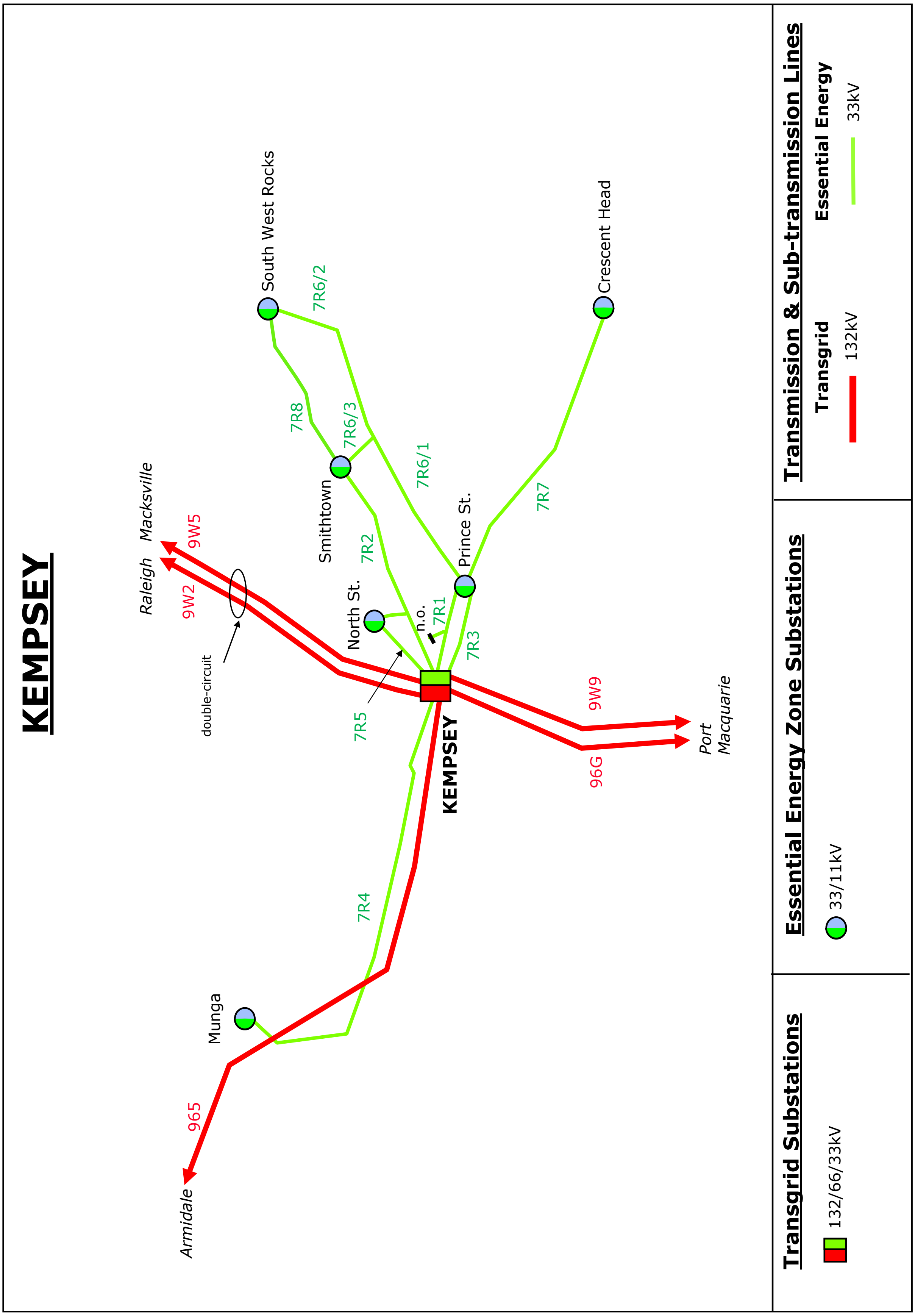
All zone substations in the Nambucca Heads area are in the Mid North Coast region.

The Nambucca Heads area sub-transmission system is supplied from the Transgrid 132kV transmission network. Nambucca Heads is a 66/11kV zone substation supplied via a 66kV line from Transgrid's Nambucca 132/66kV substation, while Raleigh and Macksville are 132/11kV zone substations supplied from the Transgrid 132kV transmission network between Kempsey and Coffs Harbour.


COFFS HARBOUR AND NAMBUCCA HEADS
Woolgoolga
Moonee
Coffs Harbour North
Coffs Harbour South
Sawtell
Nambucca Heads
Macksville
Raleigh
Boambee South
Nana Glen
Ulong
Dorrigo
n.o.
COFFS HARBOUR
NAMBUCCA HEADS
Koolkhan
Lismore
Armidale
Kempsey
7509
7510
87C
7501
711:CHN
706
705
702
751
703:NGN
7502
7503
96H
89
87
96C/1(C)
96C/2(D)
96C/1(A)
9W8
9W3
9W7
9W6
9W5
9W2
Transmission & Sub-transmission Lines
Transgrid
330kV
132kV
Dual circuit
Essential Energy
66kV
132kV
Essential Energy Zone Substations
132/66/11kV
132/11kV
66/11kV
Transgrid Substations
330/132/66kV
132/66kV

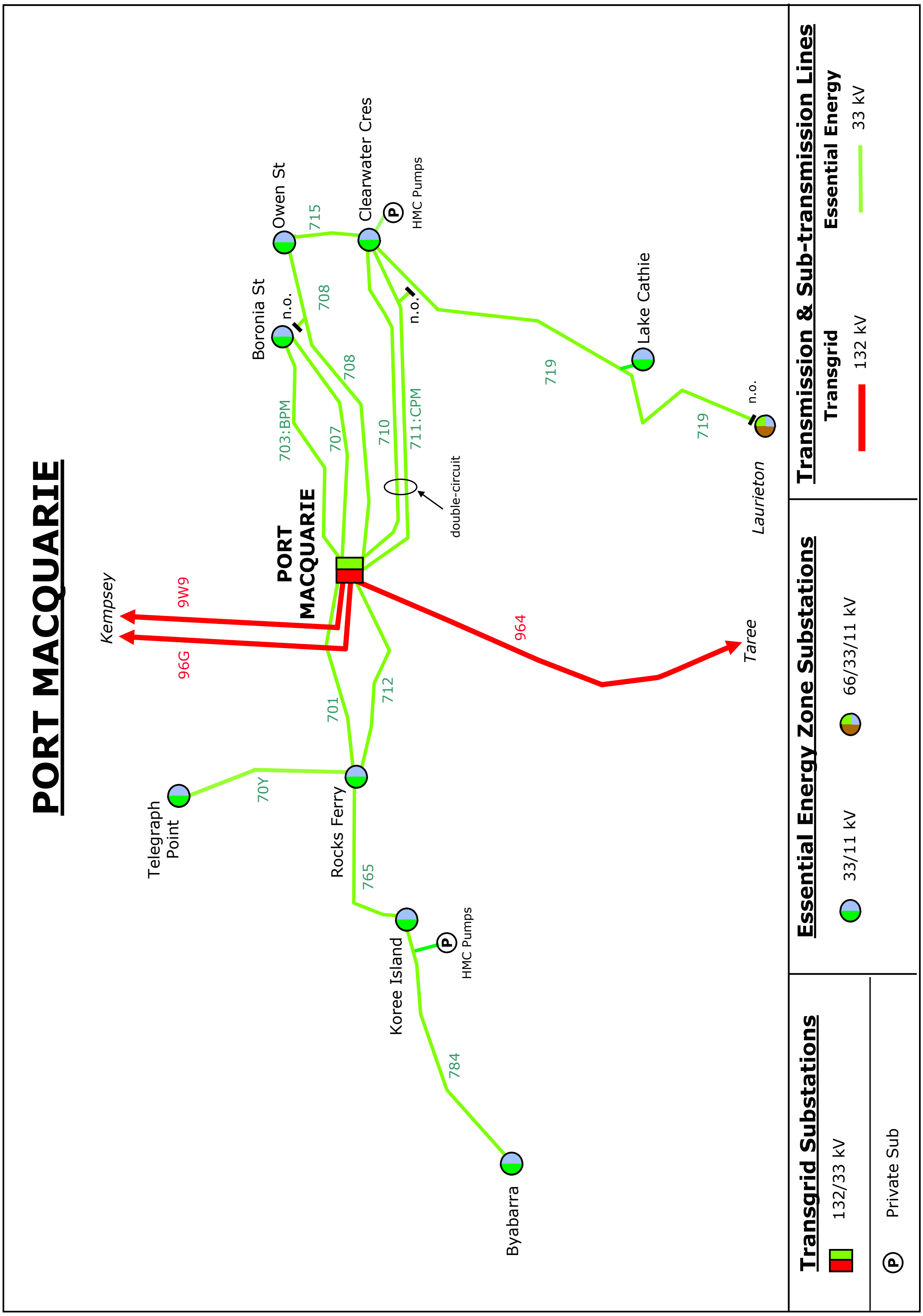
2.4.7 KEMPSEY

All zone substations in the Kempsey area are in the Mid North Coast region. The Kempsey area sub-transmission system is supplied from the Transgrid 132/33kV sub-transmission substation at Kempsey.


KEMPSEY
South West Rocks
Crescent Head
Smithtown
Prince St.
North St.
Munga
KEMPSEY
Raleigh
Macksville
Port Macquarie
Armidale
double-circuit
n.o.
7R1
7R2
7R3
7R4
7R5
7R6/1
7R6/2
7R6/3
7R7
7R8
9W2
9W5
9W9
96G
965
Transgrid Substations
132/66/33kV
Essential Energy Zone Substations
33/11kV
Transmission & Sub-transmission Lines
Transgrid
132kV
Essential Energy
33kV

2.4.8 PORT MACQUARIE

All zone substations in the Port Macquarie area are in the Mid North Coast region. The Port Macquarie area sub-transmission system is supplied from the Transgrid 132/33kV sub-transmission substation at Port Macquarie.



2.4.9 HERONS CREEK

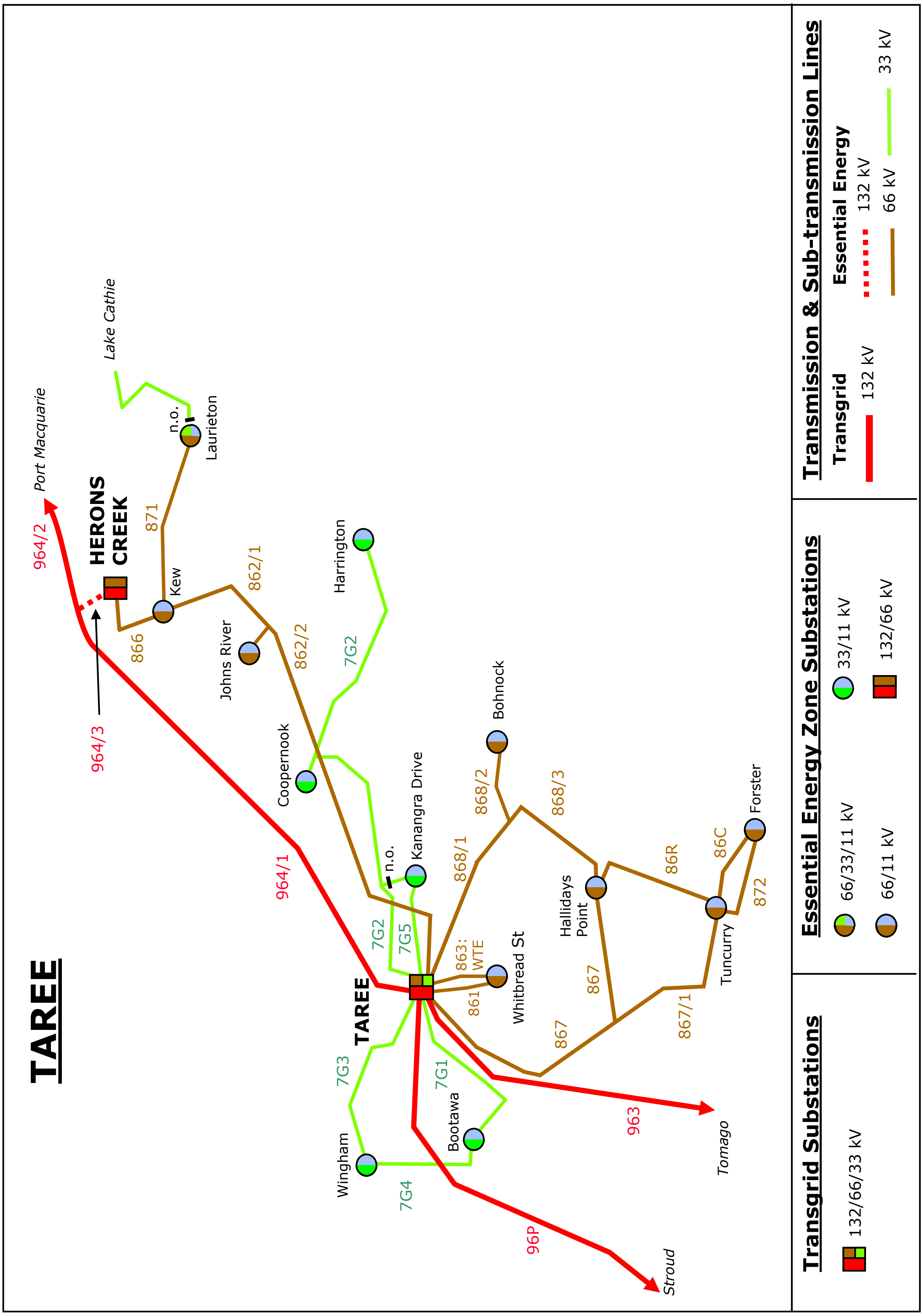
All zone substations in the Herons Creek area are in the Mid North Coast region.

The Herons Creek 132/66kV substation is owned by Essential Energy. It receives supply via a tee off Transgrid's Taree – Port Macquarie 132kV line (#964). Johns River, Kew and Laurieton 66/11kV zone substations take normal 66kV supply from Herons Creek, and backup 66kV supply from Transgrid's Taree 132/66/33kV substation via the Essential Energy 66kV line (#862).

2.4.10 TAREE

All zone substations in the Taree area are in the Mid North Coast region.

The Taree area sub-transmission system is supplied from the Transgrid 132/66/33kV sub-transmission substation at Taree.



TAREE
HERONS CREEK
TAREE
Port Macquarie
Lake Cathie
Laurieton
n.o.
Kew
Johns River
Harrington
Coopernook
Kanangra Drive
n.o.
Bohnock
Hallidays Point
Whitbread St
863: WTE
861
Forster
Tuncurry
Wingham
Bootawa
Tomago
Stroud
964/2
964/3
964/1
963
96P
866
871
862/1
862/2
868/1
868/2
868/3
867
867/1
86R
86C
872
7G1
7G2
7G3
7G4
7G5
Transgrid Substations
132/66/33 kV
Essential Energy Zone Substations
66/33/11 kV
66/11 kV
33/11 kV
132/66 kV
Transmission & Sub-transmission Lines
Transgrid
132 kV
Essential Energy
132 kV
66 kV
33 kV

2.4.11 STROUD

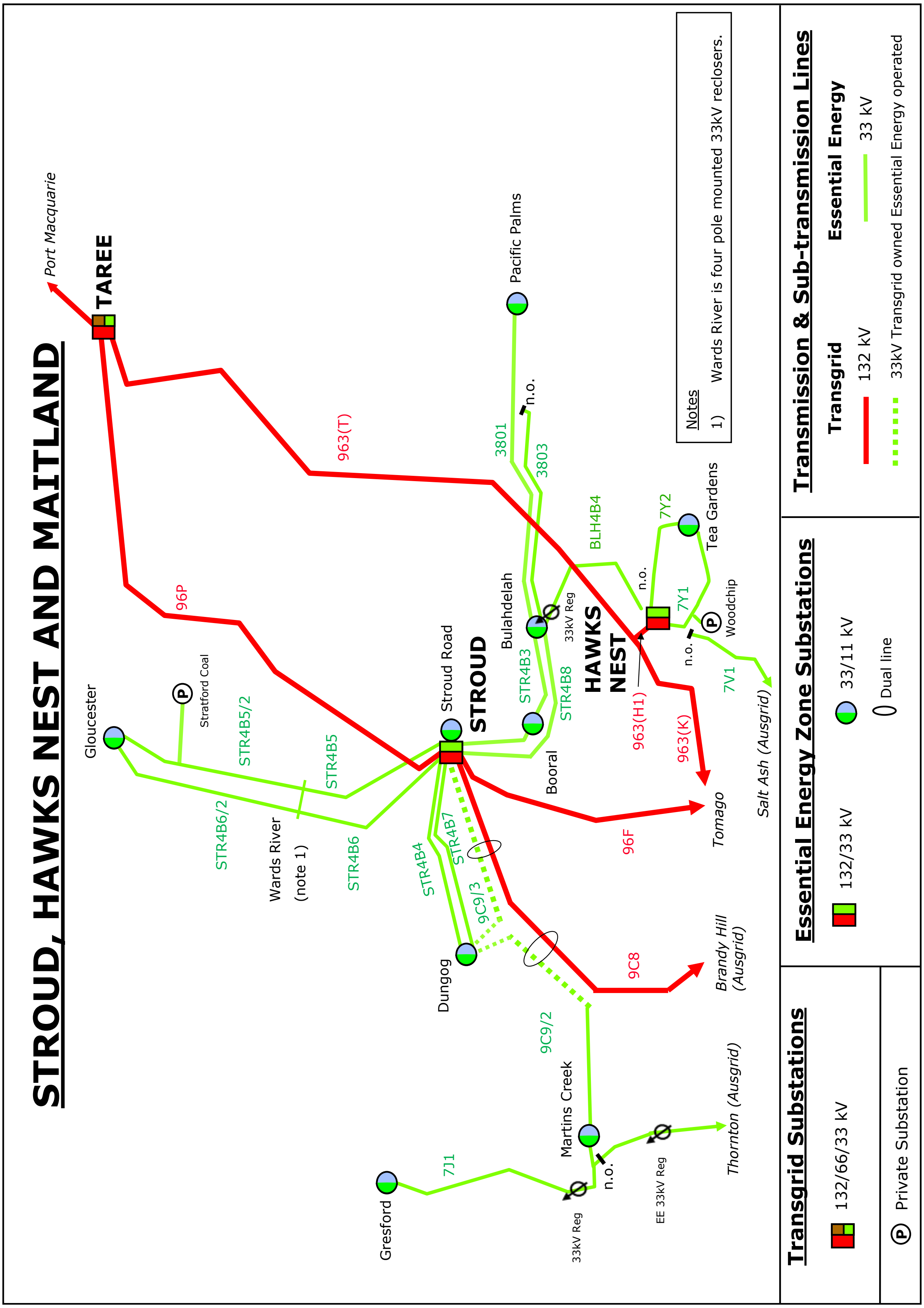
All zone substations in the Stroud area are in the Mid North Coast region.

The Stroud 132/33kV sub-transmission substation is owned by Essential Energy. It receives supply via two Transgrid 132kV lines. sub-transmission supply to Martins Creek and Gresford is taken from Stroud, with a secondary supply that emanates from Ausgrid’s Network. The 33kV sub-transmission line is partly owned by Essential Energy.

2.4.12 HAWKS NEST

All zone substations in the Hawks Nest area are in the Mid North Coast region.

The Hawks Nest 132/33kV sub-transmission substation is owned by Essential Energy. It receives supply via a tee off the Transgrid Tomago to Taree 132kV line (#963). Tea Gardens zone substation takes normal supply from the Hawks Nest 132/33kV substation. Tea Gardens zone substation takes backup supply from a 33kV sub-transmission line that emanates from Ausgrid’s Tomago network. A partial backup supply for Tea Gardens is via the 33kV network emanating from the Stroud substation via Bulahdelah.


STROUD, HAWKS NEST AND MAITLAND
Port Macquarie
TAREE
963(T)
96P
Gloucester
Stratford Coal
STR4B5/2
STR4B5
STR4B6/2
Wards River
(note 1)
STR4B6
Stroud Road
STROUD
STR4B4
STR4B7
9C9/3
Dungog
9C9/2
9C8
96F
Martins Creek
7J1
Gresford
33kV Reg
n.o.
EE 33kV Reg
Thornton (Ausgrid)
Brandy Hill
(Ausgrid)
Tomago
Booral
STR4B3
STR4B8
Bulahdelah
33kV Reg
BLH4B4
3801
3803
n.o.
Pacific Palms
HAWKS
NEST
963(H1)
963(K)
n.o.
7Y1
7Y2
Tea Gardens
Woodchip
n.o.
7V1
Salt Ash (Ausgrid)
Notes
1) Wards River is four pole mounted 33kV reclosers.
Transgrid Substations
132/66/33 kV
Private Substation
Essential Energy Zone Substations
132/33 kV
33/11 kV
Dual line
Transmission & Sub-transmission Lines
Transgrid
132 kV
Essential Energy
33 kV
33kV Transgrid owned Essential Energy operated

2.4.13 ARMIDALE

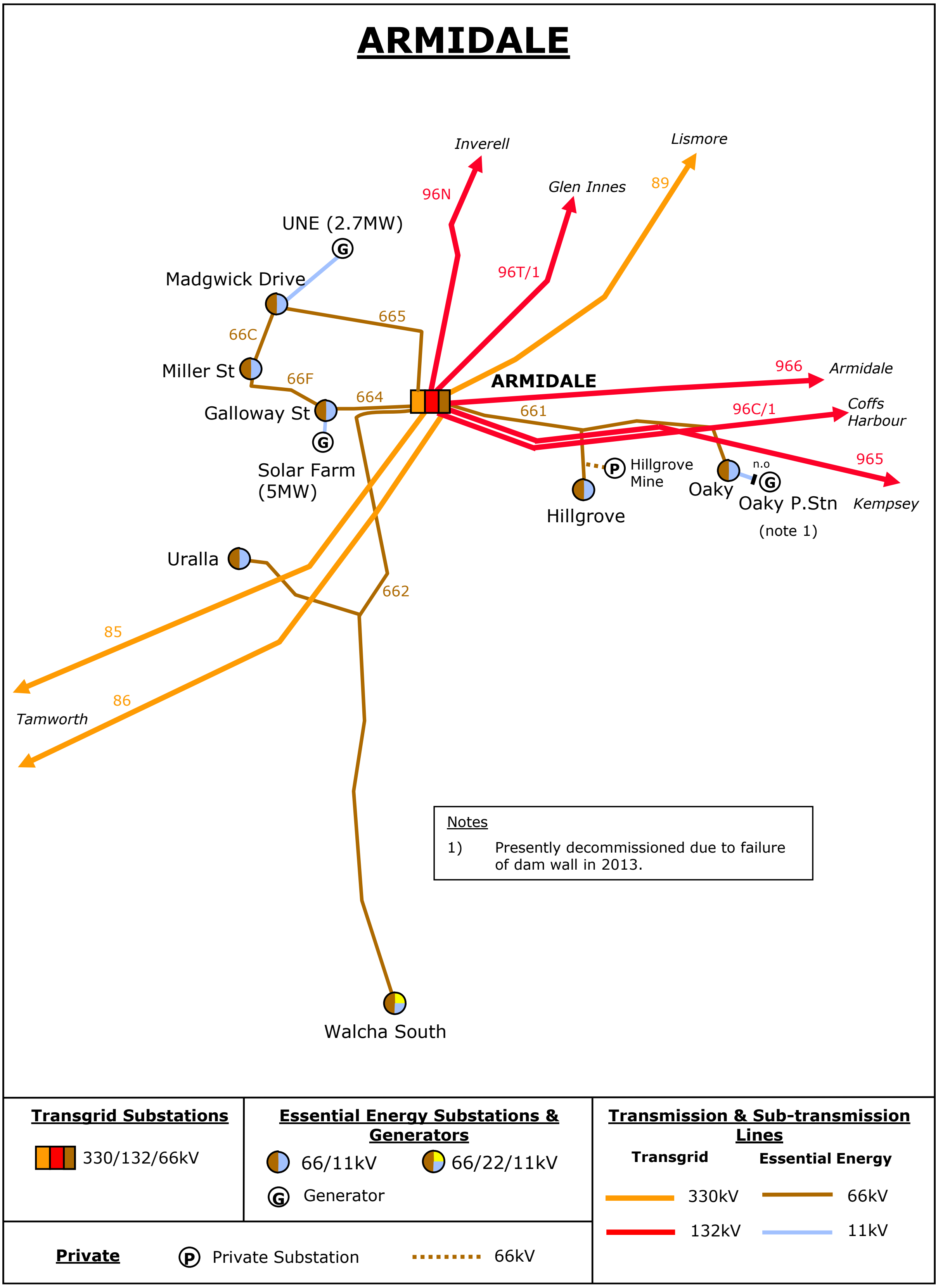
All Zone substations in the Armidale area are in the Namoi region.

The Armidale area sub-transmission system is supplied from the Transgrid 330/132/66kV sub-transmission substation at Armidale.

The 5MW hydro generation at Oaky is presently decommissioned after failure of the dam wall.

A 5MW solar generator is connected to Galloway St zone substation on the 11kV network.

A 2.7MW solar generator is connected to Madgwick Drive zone substation on the 11kV network.


ARMIDALE
Inverell
96N
Lismore
89
Glen Innes
96T/1
UNE (2.7MW)
Madgwick Drive
665
66C
Miller St
66F
664
Galloway St
Solar Farm
(5MW)
ARMIDALE
966
Armidale
Coffs
Harbour
96C/1
661
965
Kempsey
Hillgrove
Mine
Hillgrove
Oaky
n.o
Oaky P.Stn
(note 1)
Uralla
662
85
86
Tamworth
Walcha South
Notes
1) Presently decommissioned due to failure of dam wall in 2013.
Transgrid Substations
330/132/66kV
Essential Energy Substations & Generators
66/11kV
66/22/11kV
Generator
Transmission & Sub-transmission Lines
Transgrid
Essential Energy
330kV
66kV
132kV
11kV
Private
Private Substation
66kV

2.4.14 GLEN INNES

Zone substations in the Glen Innes area are spread across both the Namoi and Border Rivers regions.

The Glen Innes area sub-transmission system is supplied from the Transgrid 132/66kV sub-transmission substation at Glen Innes.

A 5.5MW hydro generator is located at Pindari Dam and is connected to the Transgrid Glen Innes 132/66kV sub-transmission substation at 66kV via feeders 6AE, 6NE, 886 and 887.

2.4.15 TENTERFIELD

All zone substations in the Tenterfield area are in the Border Rivers region.

The Tenterfield area is supplied at 22kV and 11kV from the Transgrid 132/22/11kV sub-transmission substation at Tenterfield. Essential Energy is responsible for the 22/11kV substation area.

2.4.16 WAGGAMBA (ERGON)

All zone substations in the Waggamba area are in the Border Rivers region.

The Waggamba area sub-transmission system is supplied from the Ergon 132/66/33kV sub-transmission substation at Goondiwindi. The 132/66/33kV substation is supplied by a 132kV network from Powerlink's Bulli Creek substation.

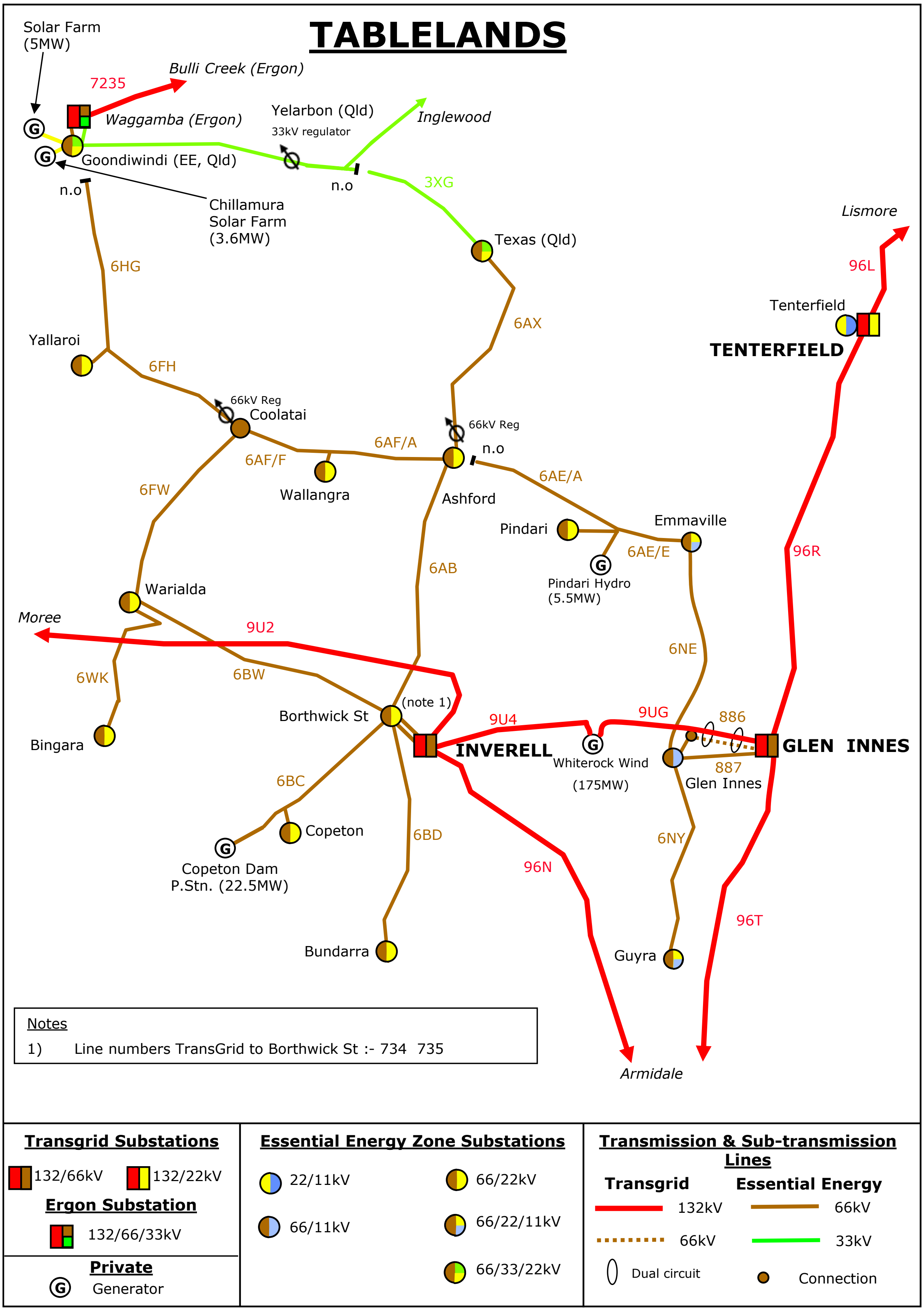
Backup supply to Goondiwindi is limited to a maximum of 20MVA via 66kV from Inverell.

2.4.17 INVERELL

All zone substations in the Inverell area are in the Border Rivers region.

The Inverell area sub-transmission system is supplied from the Transgrid 132/66kV sub-transmission substation at Inverell.

A 23MW hydro generator is located at Copeton Dam and is connected to the Transgrid Inverell 132/66kV sub-transmission substation at 66kV via feeders 6BC, 734 and 735.


TABLELANDS
Solar Farm (5MW)
7235
Bulli Creek (Ergon)
Waggamba (Ergon)
Yelarbon (Qld)
33kV regulator
Inglewood
Goondiwindi (EE, Qld)
n.o
n.o
3XG
Chillamura Solar Farm (3.6MW)
Texas (Qld)
Lismore
96L
6HG
Tenterfield
TENTERFIELD
6AX
Yallaroi
6FH
66kV Reg
Coolatai
66kV Reg
n.o
6AF/A
6AF/F
Wallangra
6AE/A
6FW
Ashford
Pindari
Emmaville
6AE/E
96R
Pindari Hydro (5.5MW)
6AB
Warialda
Moree
9U2
6NE
6WK
6BW
(note 1)
9U4
9UG
886
Borthwick St
INVERELL
Whiterock Wind (175MW)
GLEN INNES
887
Glen Innes
Bingara
6BC
6NY
Copeton
6BD
Copeton Dam P.Stn. (22.5MW)
96N
96T
Bundarra
Guyra
Notes
1) Line numbers TransGrid to Borthwick St :- 734 735
Armidale
Transgrid Substations
132/66kV
132/22kV
Ergon Substation
132/66/33kV
Private
Generator
Essential Energy Zone Substations
22/11kV
66/22kV
66/11kV
66/22/11kV
66/33/22kV
Transmission & Sub-transmission Lines
Transgrid
Essential Energy
132kV
66kV
66kV
33kV
Dual circuit
Connection

2.4.18 MOREE

Zone substations in the Moree area are spread across both the Namoi and Border Rivers regions.

The Moree area sub-transmission system is supplied from the Transgrid 132/66kV sub-transmission substation at Moree.

A 56MW solar generator is located at Moree Solar Farm and is connected to Transgrid's Moree 132/66kV sub-transmission substation at 66kV via feeder 876.

A 5MW solar generator is located at Wenna on the 22kV network.

A 5MW solar generator is located at Wathagar on the 22kV network.

A 5MW solar generator is located at Ashley on the 22kV network.

2.4.19 NARRABRI

Zone substations in the Narrabri area are spread across both the Namoi and North Western regions.

The Narrabri area sub-transmission system is supplied from the Transgrid 132/66kV sub-transmission substation at Narrabri.

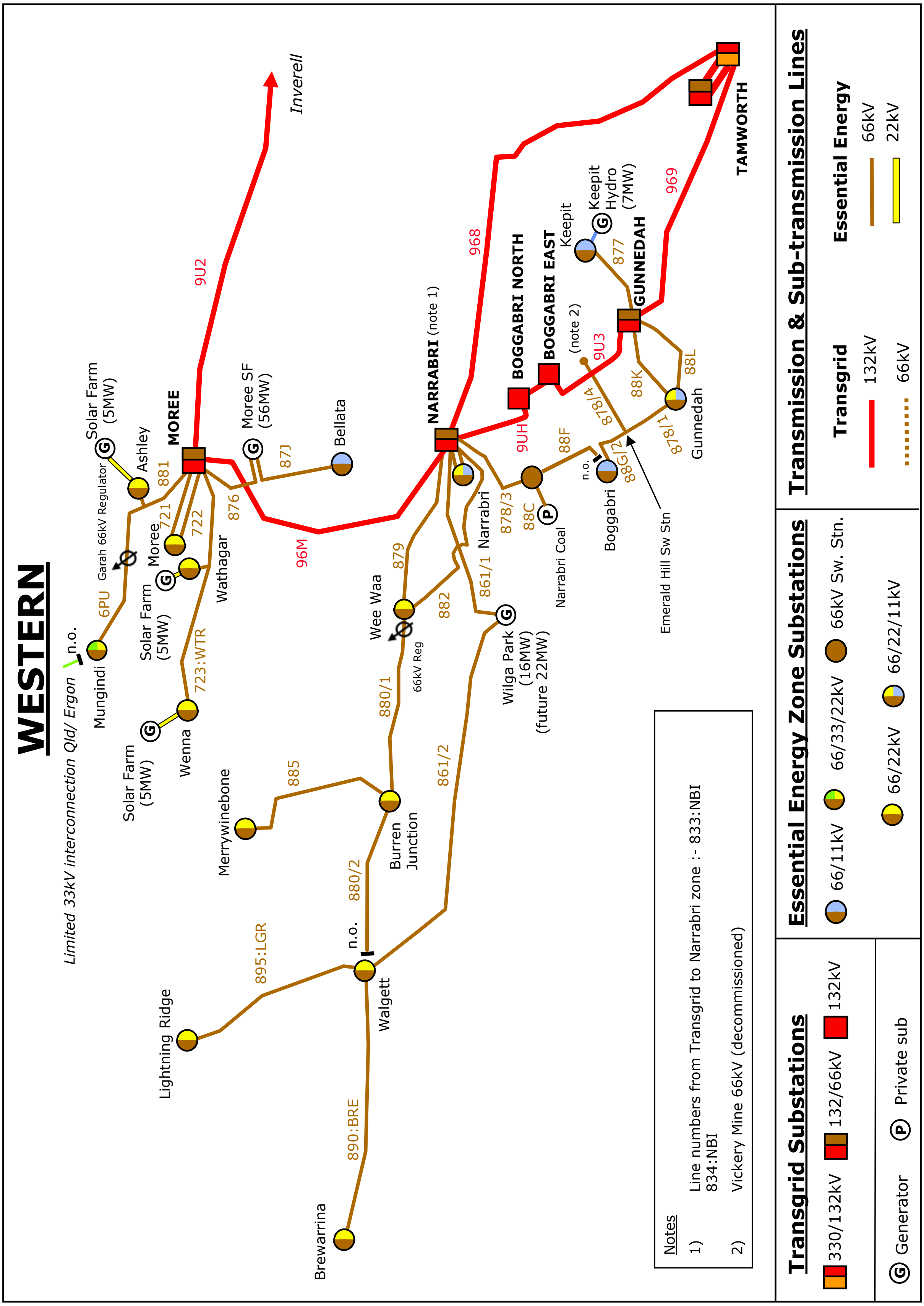
A 10MW and 6MW gas generator located at Wilga Park is connected to the Transgrid Narrabri 132/66kV sub-transmission substation at 66kV via feeder 861.

2.4.20 GUNNEDAH

All zone substations in the Gunnedah area are in the Namoi region.

The Gunnedah area sub-transmission system is supplied from the Transgrid 132/66kV sub-transmission substation at Gunnedah.

A 7MW hydro generator is located at Lake Keepit and is connected to the Transgrid Gunnedah 132/66kV sub-transmission substation at 66kV via feeder 877.


WESTERN
Limited 33kV interconnection Qld/ Ergon
n.o.
Mungindi
6PU
Garah 66kV Regulator
Solar Farm (5MW)
Ashley
881
MOREE
721
722
Moree
Solar Farm (5MW)
Wathagar
723:WTR
Wenna
Solar Farm (5MW)
876
Moree SF (56MW)
87J
Bellata
9U2
Inverell
96M
Merrywinebone
885
Burren Junction
880/2
n.o.
Walgett
895:LGR
Lightning Ridge
890:BRE
Brewarrina
Wee Waa
879
66kV Reg
880/1
882
861/2
861/1
Narrabri
NARRABRI (note 1)
968
878/3
Wilga Park (16MW) (future 22MW)
88C
Narrabri Coal
9UH
88F
BOGGABRI NORTH
BOGGABRI EAST (note 2)
9U3
878/4
n.o.
88G/2
Boggabri
Emerald Hill Sw Stn
878/1
Gunnedah
88K
88L
GUNNEDAH
877
Keepit
Keepit Hydro (7MW)
969
TAMWORTH
Notes
1) Line numbers from Transgrid to Narrabri zone :- 833:NBI 834:NBI
2) Vickery Mine 66kV (decommissioned)
Transgrid Substations
330/132kV
132/66kV
132kV
Generator
Private sub
Essential Energy Zone Substations
66/11kV
66/33/22kV
66kV Sw. Stn.
66/22kV
66/22/11kV
Transmission & Sub-transmission Lines
Transgrid
132kV
66kV
Essential Energy
66kV
22kV

2.4.21 TAMWORTH

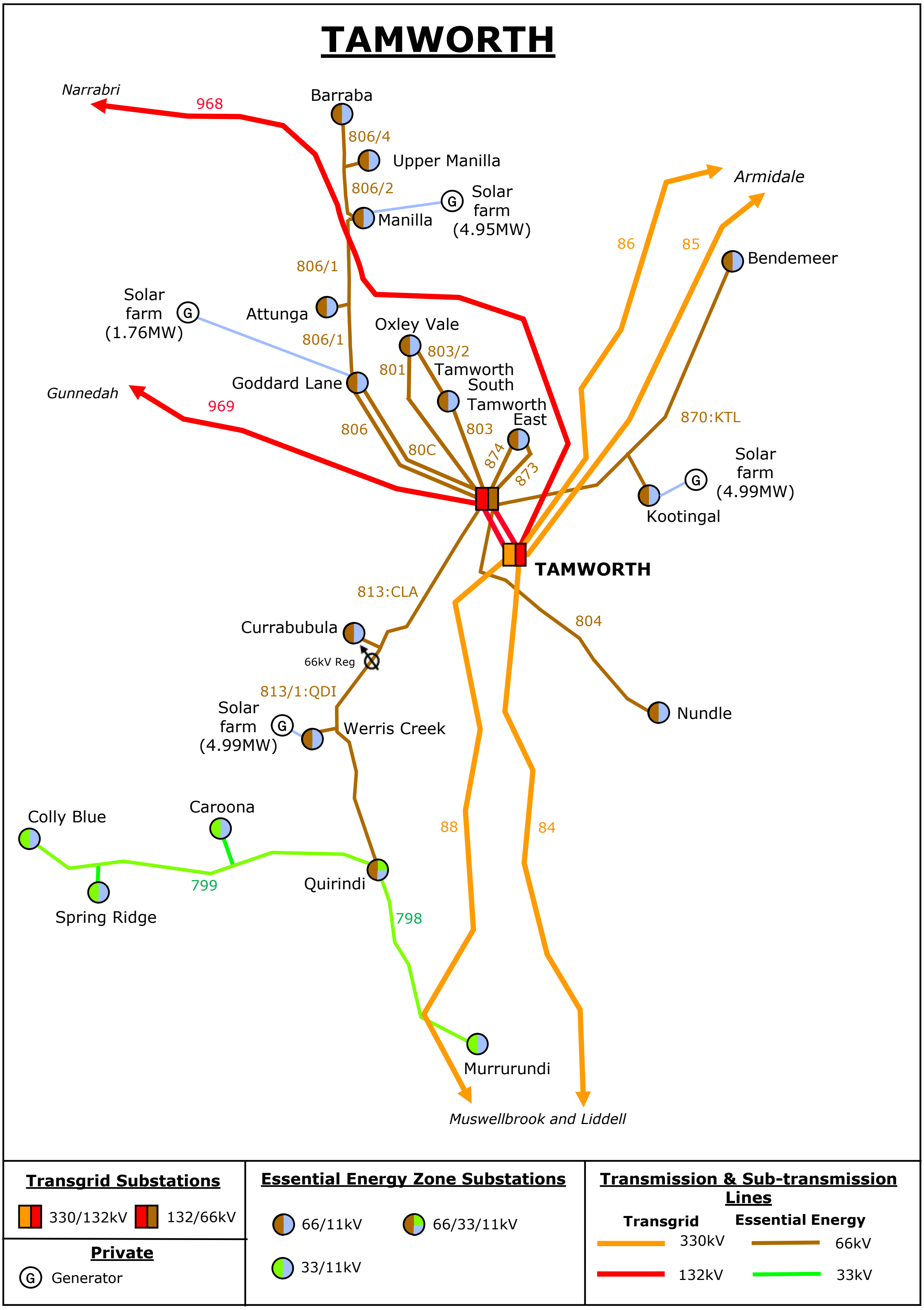
All zone substations in the Tamworth area are in the Namoi region. The Tamworth area sub-transmission system is supplied from the Transgrid 132/66kV sub-transmission substation at Tamworth.

A 4.99MW solar generator is connected to Kootingal zone substation on the 11kV network.

A 4.99MW solar generator is connected to Werris Creek zone substation on the 11kV network.

A 4.95MW solar generator is connected to Manilla zone substation on the 11kV network.

A 1.76MW solar generator is connected to Goddard Lane zone substation on the 11kV network.



TAMWORTH
Narrabri
968
Barraba
806/4
Upper Manilla
806/2
Solar farm (4.95MW)
Manilla
Armidale
86
85
Bendemeer
806/1
Solar farm (1.76MW)
Attunga
806/1
Oxley Vale
803/2
801
Tamworth South
Goddard Lane
Gunnedah
969
Tamworth East
806
803
80C
874
873
870:KTL
Solar farm (4.99MW)
Kootingal
TAMWORTH
813:CLA
804
Currabubula
66kV Reg
813/1:QDI
Solar farm (4.99MW)
Werris Creek
Nundle
Colly Blue
Caroona
88
84
799
Quirindi
Spring Ridge
798
Murrurundi
Muswellbrook and Liddell
Transgrid Substations
330/132kV
132/66kV
Private
Generator
Essential Energy Zone Substations
66/11kV
66/33/11kV
33/11kV
Transmission & Sub-transmission Lines
Transgrid
330kV
132kV
Essential Energy
66kV
33kV

2.4.22 BERYL

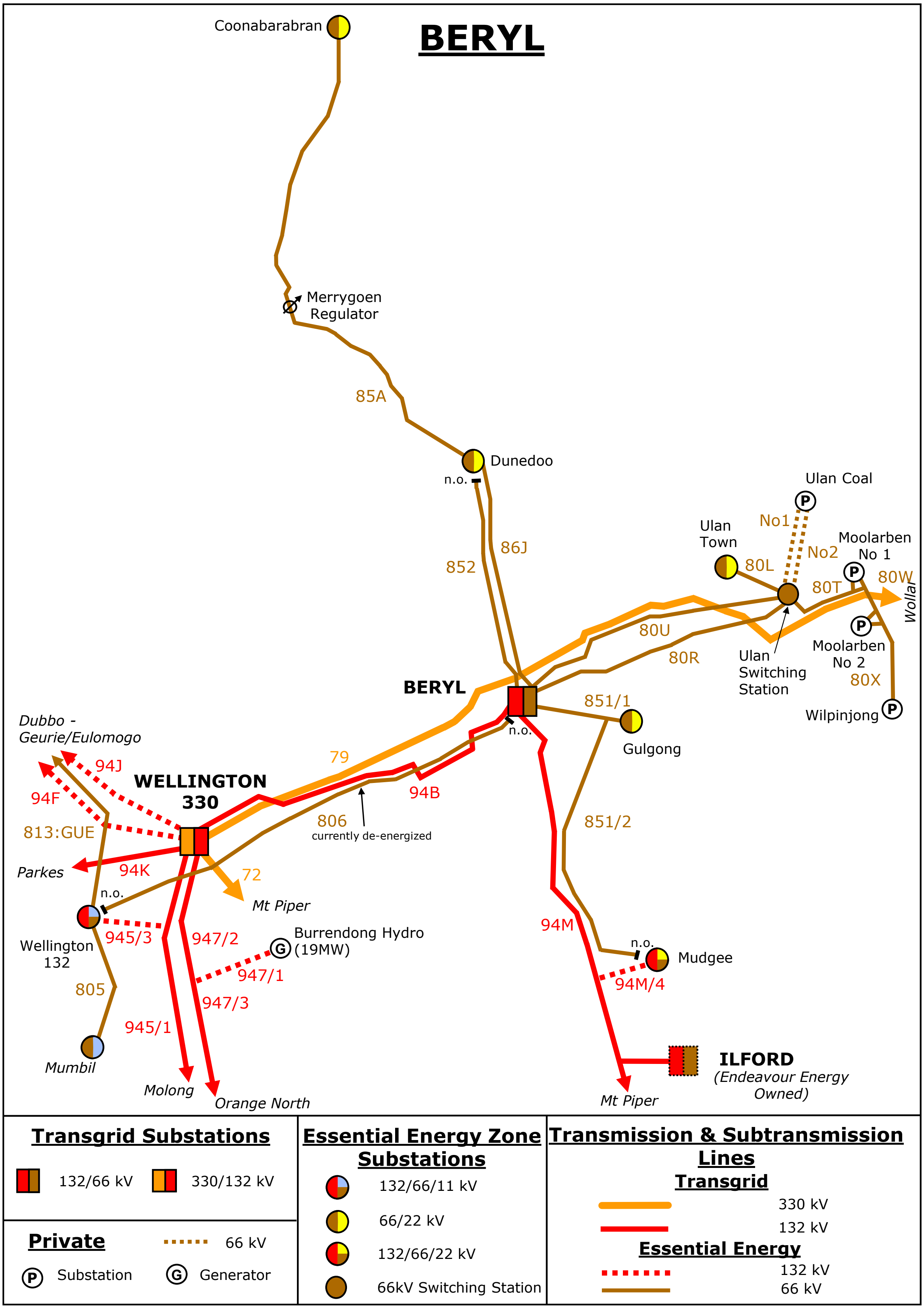
Zone substations in the Beryl area are spread across both the Namoi and Central Tablelands regions.

The Beryl area sub-transmission system is supplied from Transgrid's 132/66kV sub-transmission substation. The Mudgee substation is normally connected to the Essential Energy 132kV teed line from the Transgrid Mt Piper to Beryl 132kV transmission line with back up from the Beryl 66kV system via Gulgong.

2.4.23 WELLINGTON

All zone substations in the Wellington area are in the Central Tablelands region.

The Essential Energy Wellington 132/66/11kV zone substation is normally connected to the Essential Energy 132kV tee line #945/3 from Transgrid's Wellington to Molong 132kV transmission line #945. The 66kV supply for Mumbil is obtained from the Wellington 11kV busbar via a step up 66/11kV transformer. The backup supply for Wellington and Mumbil is via the 66kV powerline #813 from Eulomogo.


BERYL
Coonabarabran
Merrygoen Regulator
85A
Dunedoo
n.o.
852
86J
Ulan Coal
No1
No2
Ulan Town
80L
Moolarben No 1
80T
80W
Wollar
80U
80R
Ulan Switching Station
Moolarben No 2
80X
Wilpinjong
BERYL
n.o.
851/1
Gulgong
851/2
Dubbo - Geurie/Eulomogo
94J
94F
813:GUE
WELLINGTON 330
79
94B
806
currently de-energized
Parkes
94K
72
Mt Piper
n.o.
Wellington 132
945/3
947/2
Burrendong Hydro (19MW)
947/1
947/3
805
945/1
Mumbil
Molong
Orange North
94M
n.o.
Mudgee
94M/4
ILFORD
(Endeavour Energy Owned)
Mt Piper
Transgrid Substations
132/66 kV
330/132 kV
Private
66 kV
Substation
Generator
Essential Energy Zone Substations
132/66/11 kV
66/22 kV
132/66/22 kV
66kV Switching Station
Transmission & Subtransmission Lines
Transgrid
330 kV
132 kV
Essential Energy
132 kV
66 kV

2.4.24 DUBBO

Zone substations in the Dubbo area are spread across both the Central Tablelands and North Western regions.

Essential Energy owns two 132kV powerlines emanating from the Transgrid owned Wellington 330/132kV sub-transmission substation that support the Dubbo 132/66kV sub-transmission substation and Nyngan 132/66kV sub-transmission substation supply areas.

The Narromine zone substation is supplied from the Narromine South Switching station connected between Dubbo South and Nyngan 132kV.

The Nevertire zone substation is normally supplied from the 132kV network via a tee, off the 94W Dubbo to Nyngan 132kV line, with back up supply available from Nyngan 66kV system via Nyngan Town.

A 9.2MW solar generator is located at Narromine on the 22kV network, and a 14.5MW solar generator is connected at Dubbo South on the 11kV network.

A 105MW solar generator is located at Nevertire and is connected to the Dubbo 132/66kV sub-transmission substation at 132kV via the feeder 94W.

A 5MW solar generator is located at Nyngan Town on the 22kV network.

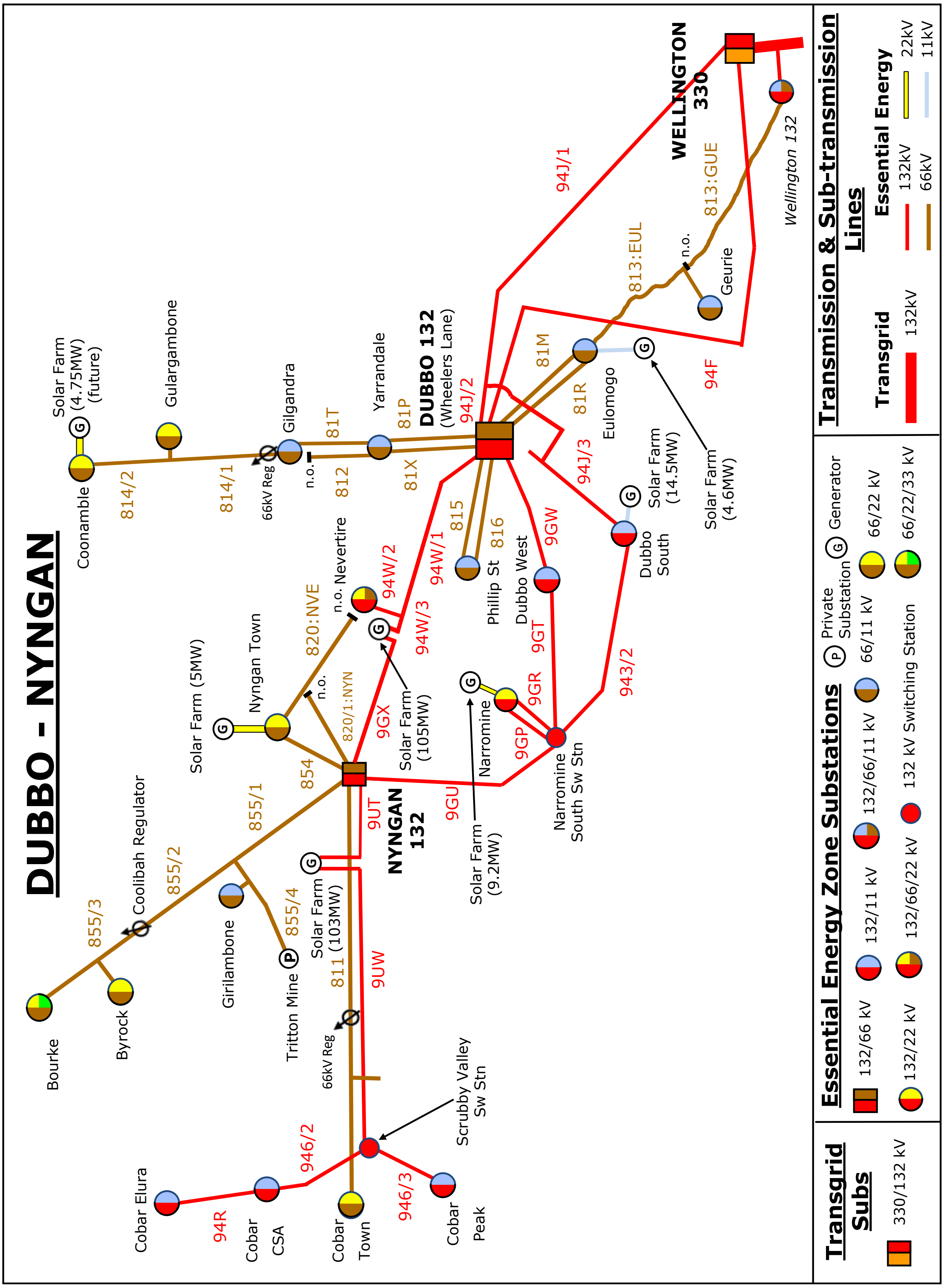
A 4.6MW solar generator is connected to Eulomogo zone substation on the 11kV network.

2.4.25 NYNGAN

All zone substations in the Nyngan area are in the North Western region.

Essential Energy's Nyngan 132/66kV substation is supplied from our Dubbo 132/66kV sub-transmission substation via two Essential Energy 132kV transmission lines. The 94W Dubbo to Nyngan 132kV line has a tee connection into Nevertire, with back up supply available from Nyngan 66kV system via Nyngan Town and the 94J-9GU Dubbo to Nyngan 132kV line via Narromine South switching station.

A 102MW solar generator is located at Nyngan Solar Farm and is connected to the Nyngan 132/66kV sub-transmission substation at 132kV via the feeder 9UT.


DUBBO - NYNGAN
Bourke
Byrock
855/3
Coolibah Regulator
855/2
855/1
Girilambone
855/4
Tritton Mine
Solar Farm (103MW)
811
66kV Reg
9UW
Cobar Elura
94R
Cobar CSA
946/2
Cobar Town
946/3
Cobar Peak
Scrubby Valley Sw Stn
Coonamble
Solar Farm (4.75MW) (future)
814/2
Gulargambone
814/1
66kV Reg
Gilgandra
n.o.
812
81T
Yarrandale
81P
81X
Solar Farm (5MW)
Nyngan Town
854
820:NVE
n.o.
Nevertire
n.o.
820/1:NYN
9GX
Solar Farm (105MW)
94W/2
94W/3
94W/1
NYNGAN 132
9UT
9GU
Solar Farm (9.2MW)
Narromine
9GP
9GR
9GT
Narromine South Sw Stn
815
816
Phillip St
Dubbo West
9GW
DUBBO 132 (Wheelers Lane)
94J/2
94J/3
943/2
Dubbo South
Solar Farm (14.5MW)
Solar Farm (4.6MW)
81R
Eulomogo
81M
94F
813:EUL
n.o.
Geurie
813:GUE
94J/1
WELLINGTON 330
Wellington 132
Transgrid Subs
330/132 kV
Essential Energy Zone Substations
132/66 kV
132/11 kV
132/66/11 kV
66/11 kV
66/22 kV
132/22 kV
132/66/22 kV
132 kV Switching Station
66/22/33 kV
Private Substation
Generator
Transmission & Sub-transmission Lines
Transgrid
132kV
Essential Energy
132kV
66kV
22kV
11kV

2.4.26 BROKEN HILL

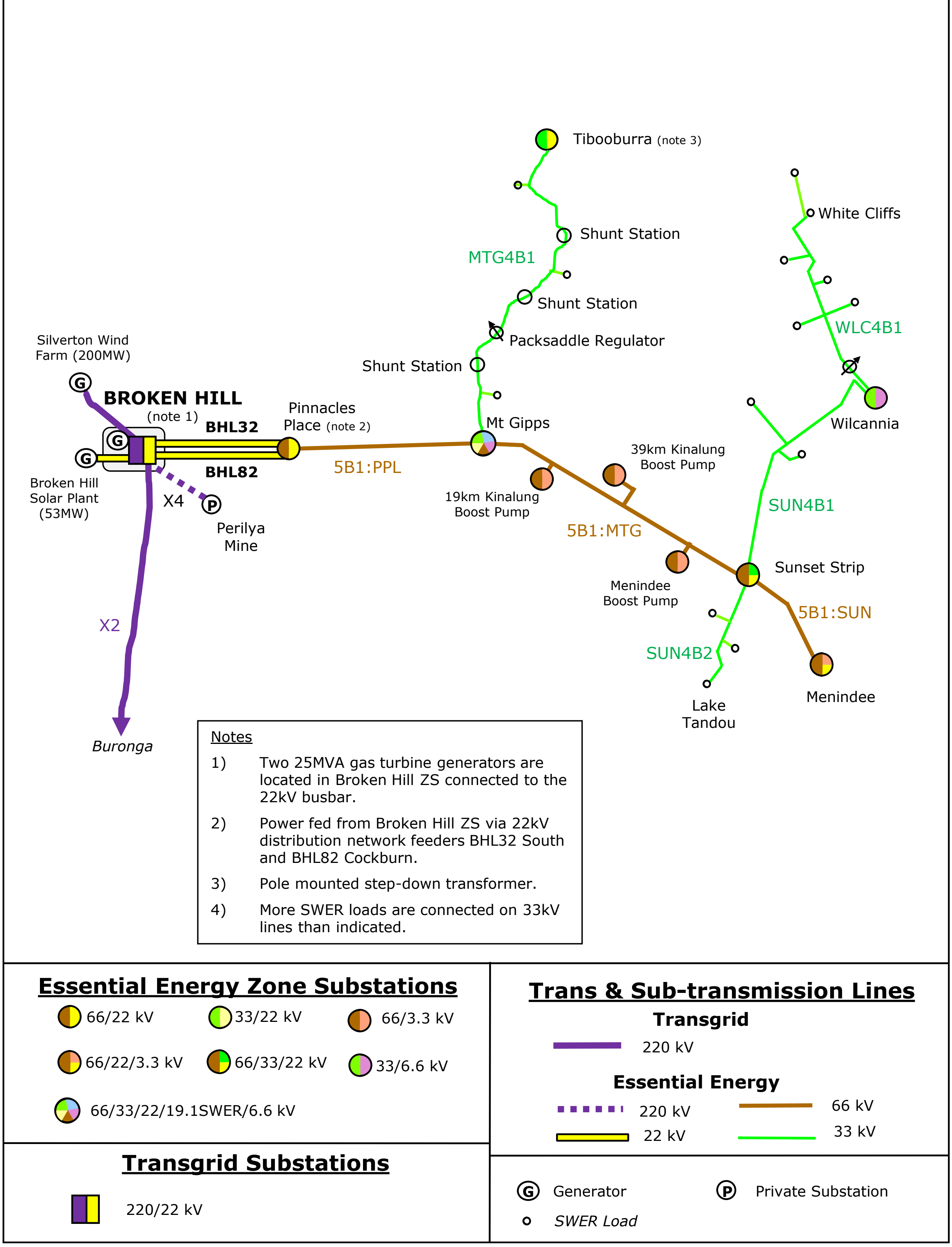
All zone substations in the Broken Hill area are in the Murray region.

The Broken Hill area is supplied from Transgrid's 220/22kV substation. Essential Energy utilises two 22kV lines and steps them up to 66kV for supply to Mt Gipps and Sunset Strip from which 33kV and other voltage levels are derived for specific purposes.

A 53MW solar generator is located at Broken Hill and is connected to the Transgrid Broken Hill 220/22kV sub-transmission substation at 22kV.

There have been changes to the water pump network with a new water supply now coming from Wentworth. It is unclear what the long-term configuration will be for the existing water pump infrastructure and whether it will affect peak loads.

BROKEN HILL


Tibooburra (note 3)
White Cliffs
Shunt Station
MTG4B1
Shunt Station
WLC4B1
Packsaddle Regulator
Silverton Wind Farm (200MW)
Shunt Station
BROKEN HILL
(note 1)
BHL32
Pinnacles Place (note 2)
Mt Gipps
Wilcannia
39km Kinalung Boost Pump
Broken Hill Solar Plant (53MW)
BHL82
5B1:PPL
X4
Perilya Mine
19km Kinalung Boost Pump
SUN4B1
5B1:MTG
Menindee Boost Pump
Sunset Strip
5B1:SUN
X2
SUN4B2
Lake Tandou
Menindee
Buronga
Notes
1) Two 25MVA gas turbine generators are located in Broken Hill ZS connected to the 22kV busbar.
2) Power fed from Broken Hill ZS via 22kV distribution network feeders BHL32 South and BHL82 Cockburn.
3) Pole mounted step-down transformer.
4) More SWER loads are connected on 33kV lines than indicated.
Essential Energy Zone Substations
66/22 kV
33/22 kV
66/3.3 kV
66/22/3.3 kV
66/33/22 kV
33/6.6 kV
66/33/22/19.1SWER/6.6 kV
Trans & Sub-transmission Lines
Transgrid
220 kV
Essential Energy
220 kV
66 kV
22 kV
33 kV
Transgrid Substations
220/22 kV
Generator
Private Substation
SWER Load

2.4.27 ORANGE

All zone substations in the Orange area are in the Central Tablelands region.

The Orange area sub-transmission system is supplied from Transgrid's 132/66kV sub-transmission substation, with the Orange town substations (Industrial, North, South and West) being supplied via a 66kV ring network. The Orange area provides a back-up 66kV supply to Molong via Orange West which supplies Cumnock and Molong via a 66/11kV transformer.

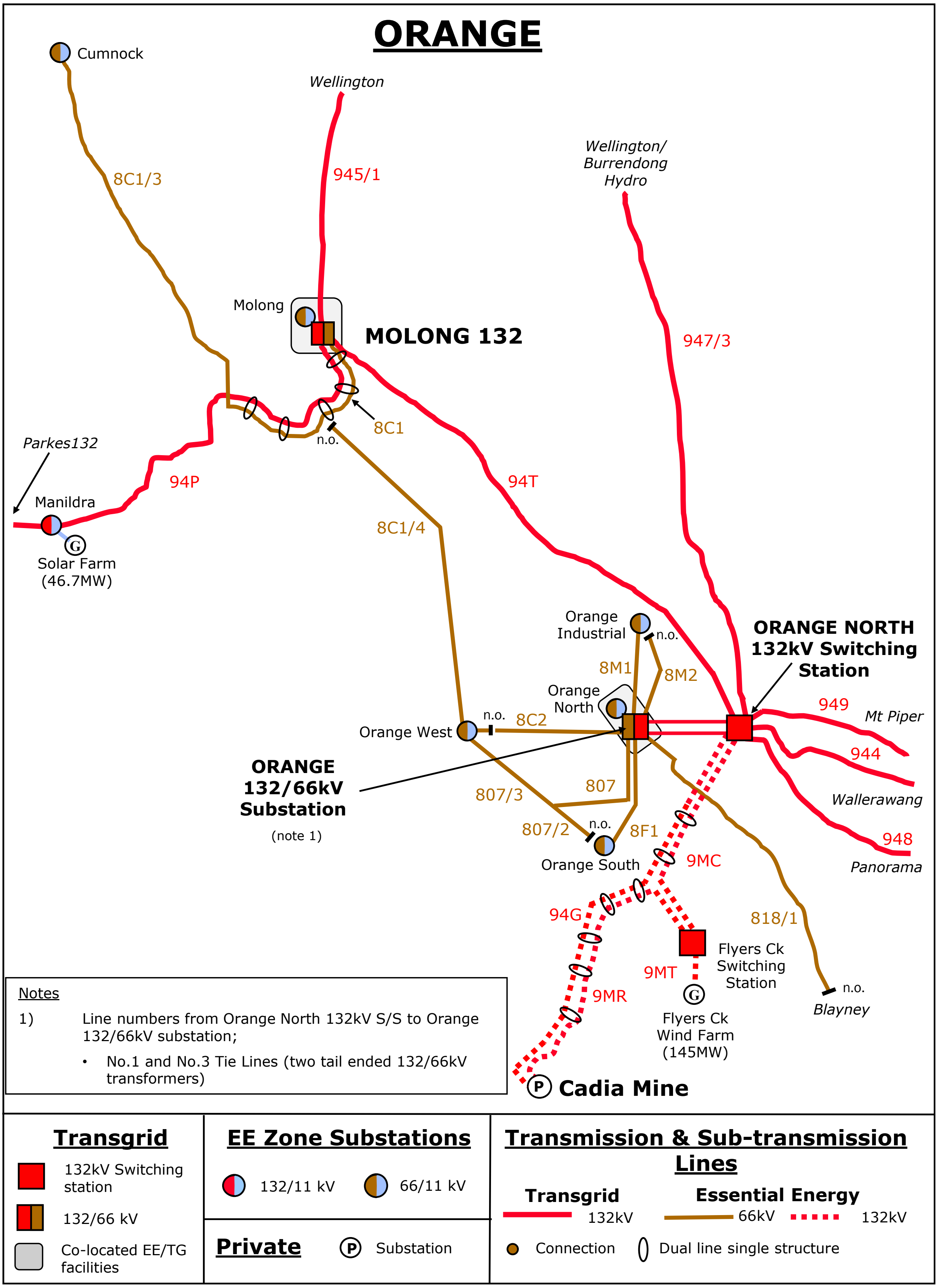
A 145MW wind generator is located at Flyers Creek Wind Farm and is connected to Transgrid's Orange North 132kV Switching Station through the Flyers Creek Switching Station via feeders 9MT and 9MC.

2.4.28 MOLONG

All zone substations in the Molong area are in the Central Tablelands region.

The Molong 132/66/11kV substation is a shared asset with Transgrid, whereby Essential Energy takes supply at 66kV which supplies Cumnock and Molong via a 66/11kV transformer, with back up supply from the Orange 66kV network via Orange West. Manildra zone substation is also a shared asset with Transgrid and is supplied from Transgrid's Molong substation at 132kV.

A 46.7MW solar generator is located at Manildra on the 11kV network.


ORANGE
Cumnock
Wellington
8C1/3
945/1
Wellington/
Burrendong
Hydro
Molong
MOLONG 132
947/3
8C1
n.o.
Parkes132
Manildra
94P
94T
8C1/4
Solar Farm
(46.7MW)
Orange
Industrial
n.o.
ORANGE NORTH
132kV Switching
Station
8M1
8M2
Orange
North
n.o.
8C2
Orange West
949
Mt Piper
944
ORANGE
132/66kV
Substation
(note 1)
807
807/3
Wallerawang
807/2
n.o.
8F1
948
Orange South
9MC
Panorama
94G
818/1
Flyers Ck
Switching
Station
9MT
9MR
n.o.
Blayney
Flyers Ck
Wind Farm
(145MW)
Cadia Mine
Notes
1) Line numbers from Orange North 132kV S/S to Orange 132/66kV substation;
• No.1 and No.3 Tie Lines (two tail ended 132/66kV transformers)
Transgrid
132kV Switching station
132/66 kV
Co-located EE/TG facilities
EE Zone Substations
132/11 kV
66/11 kV
Private
Substation
Transmission & Sub-transmission Lines
Transgrid
132kV
Essential Energy
66kV
132kV
Connection
Dual line single structure

2.4.29 BATHURST

All zone substations in the Bathurst area are in the Central Tablelands region.

The Bathurst area sub-transmission system is supplied from Transgrid's Panorama 132/66kV sub-transmission substation with the Bathurst town substations (Russell St, Raglan and Stewart) being supplied via 66kV ring network.

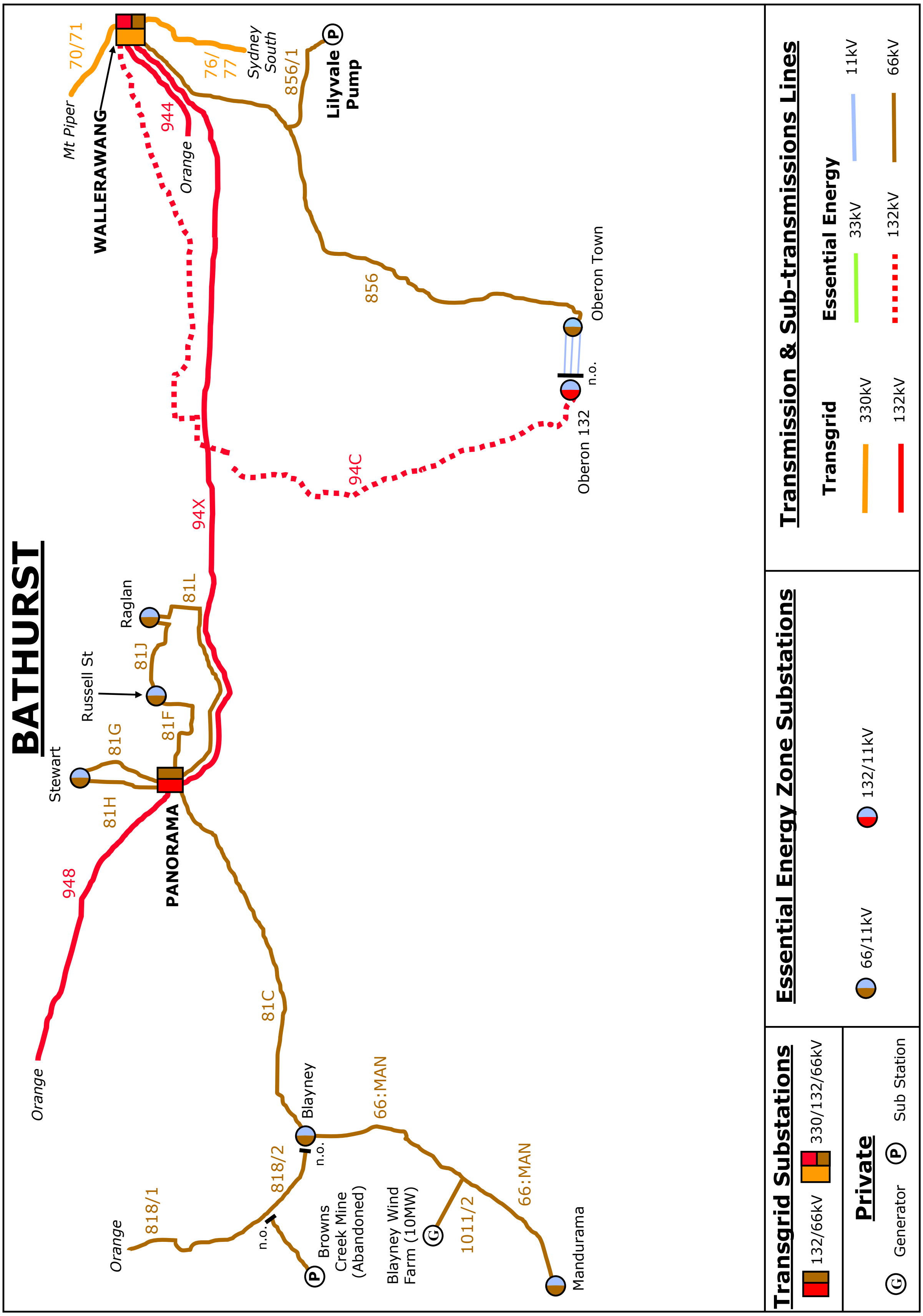
The Blayney and Mandurama substations are supplied by a radial 66kV line from Panorama with a 66kV back up supply from Orange if required.

A 10MW wind generator is located at Blayney wind farm and is connected to the Transgrid Panorama 132/66kV sub-transmission substation at 66kV via feeders 66:MAN and 81C.

2.4.30 OBERON

All zone substations in the Oberon area are in the Central Tablelands region.

The zone substations at Oberon are supplied directly from Wallerawang via Essential Energy's 66kV and 132kV sub-transmission lines respectively.


BATHURST
WALLERAWANG
Mt Piper
70/71
76/
77
Sydney
South
856/1
Lilyvale
Pump
944
Orange
856
Oberon Town
n.o.
Oberon 132
94C
94X
81L
Raglan
81J
Russell St
81F
81G
Stewart
81H
PANORAMA
948
Orange
81C
Blayney
n.o.
66:MAN
818/2
818/1
Orange
n.o.
Browns
Creek Mine
(Abandoned)
Blayney Wind
Farm (10MW)
1011/2
66:MAN
Mandurama
Transgrid Substations
132/66kV
330/132/66kV
Private
Generator
Sub Station
Essential Energy Zone Substations
66/11kV
132/11kV
Transmission & Sub-transmissions Lines
Transgrid
330kV
132kV
Essential Energy
33kV
11kV
132kV
66kV

2.4.31 PARKES

All zone substations in the Parkes area are in the Central region.

The Parkes area sub-transmission system is supplied from Transgrid's 132/66kV sub-transmission substation via a 66kV 89L/89G ring to the Parkes Town zone substation with a feed to Peak Hill and Tomingley Mine Substations.

A 5MW solar generator is located at Peak Hill on the 11kV network, and a 5MW solar generator is located at Trundle on the 22kV network.

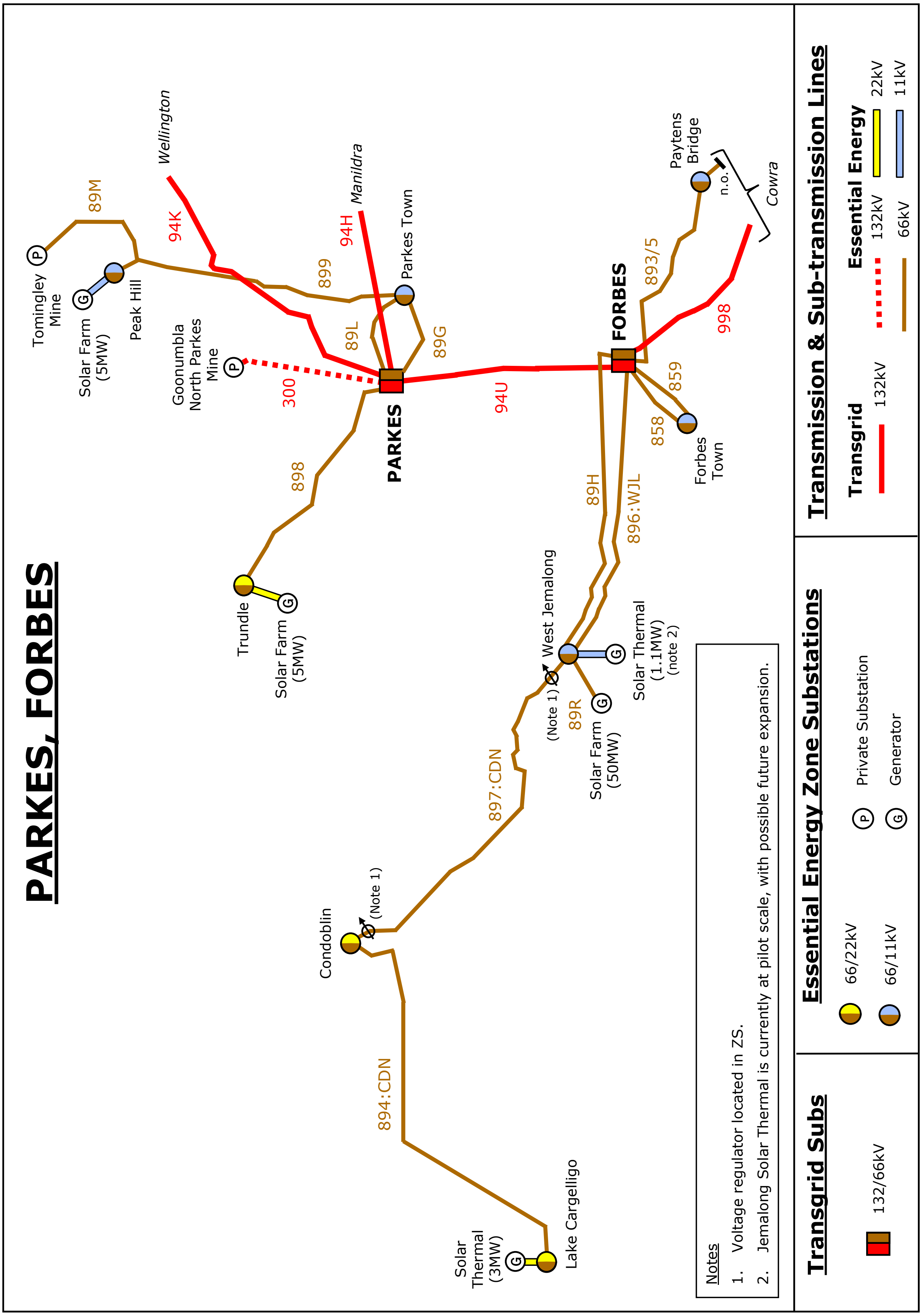
2.4.32 FORBES

Zone substations in the Forbes area are spread across both the Central and Central Tablelands regions.

The Forbes area sub-transmission system is supplied from Transgrid's Forbes 132/66kV sub-transmission substation.

A 50MW solar generator is located at West Jemalong and is connected to the Transgrid Forbes 132/66kV sub-transmission substation at 66kV via the feeder 89R.

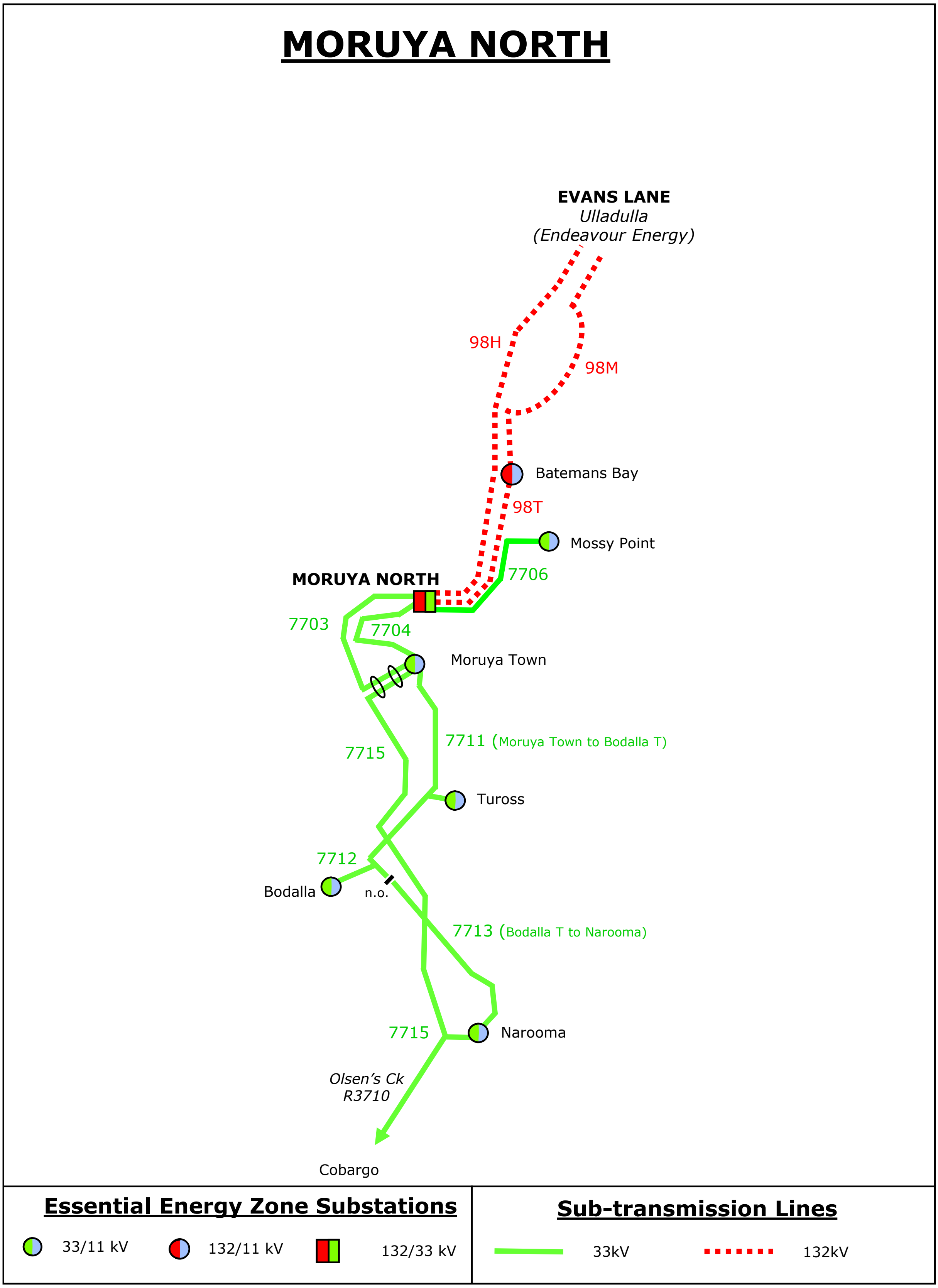
A 3MW solar thermal generator is located at Lake Cargelligo on the 22kV network, and a 1.1MW solar thermal generator is located at West Jemalong on the 11kV network.


PARKES, FORBES
PARKES
FORBES
Wellington
Manildra
Cowra
94K
94H
94U
998
300
89M
899
89L
89G
898
893/5
859
858
89H
896:WJL
89R
897:CDN
894:CDN
Tomingley Mine
Solar Farm (5MW)
Peak Hill
Goonumbla North Parkes Mine
Parkes Town
Paytens Bridge
n.o.
Forbes Town
Trundle
Solar Farm (5MW)
West Jemalong
(Note 1)
Solar Thermal (1.1MW) (note 2)
Solar Farm (50MW)
Condoblin
(Note 1)
Lake Cargelligo
Solar Thermal (3MW)
Notes
1. Voltage regulator located in ZS.
2. Jemalong Solar Thermal is currently at pilot scale, with possible future expansion.
Transgrid Subs
132/66kV
Essential Energy Zone Substations
66/22kV
66/11kV
Private Substation
Generator
Transmission & Sub-transmission Lines
Transgrid
132kV
Essential Energy
132kV
66kV
22kV
11kV

2.4.33 MORUYA NORTH

All zone substations in the Moruya North area are in the South Eastern region.

Essential Energy's Moruya North sub-transmission substation is supplied via 2 x 132kV transmission lines from Endeavour Energy's 132kV transmission system that emanate from the Evans Lane switching station near Ulladulla. Essential Energy partly owns with Endeavour Energy both 132kV transmission lines from Evans Lane switching station.


MORUYA NORTH
EVANS LANE
Ulladulla
(Endeavour Energy)
98H
98M
Batemans Bay
98T
Mossy Point
MORUYA NORTH
7706
7703
7704
Moruya Town
7711 (Moruya Town to Bodalla T)
7715
Tuross
7712
Bodalla
n.o.
7713 (Bodalla T to Narooma)
7715
Narooma
Olsen's Ck
R3710
Cobargo
Essential Energy Zone Substations
33/11 kV
132/11 kV
132/33 kV
Sub-transmission Lines
33kV
132kV

2.4.34 COOMA

All zone substations in the Cooma area are in the South Eastern region.

The Cooma area sub-transmission system is supplied from Transgrid's 132/66kV sub-transmission substation at Cooma.

A 5MW hydro generator is located at Brown Mountain Hydro and is connected to Steeple Flat 132/66kV sub-transmission substation at 66kV via feeder 810.

A 114MW wind generator is located at Boco Rock wind farm and is connected to the Steeple Flat 132/66kV sub-transmission substation which is connected to Transgrid's Cooma 132/66kV sub-transmission substation at 132kV via the feeder 97R.

A 1MW hydro generator is located at Jindabyne Dam and is connected to the Jindabyne zone substation 11kV busbar via feeder JIN22.

2.4.35 MUNYANG

All zone substations in the Munyang area are in the South Eastern region.

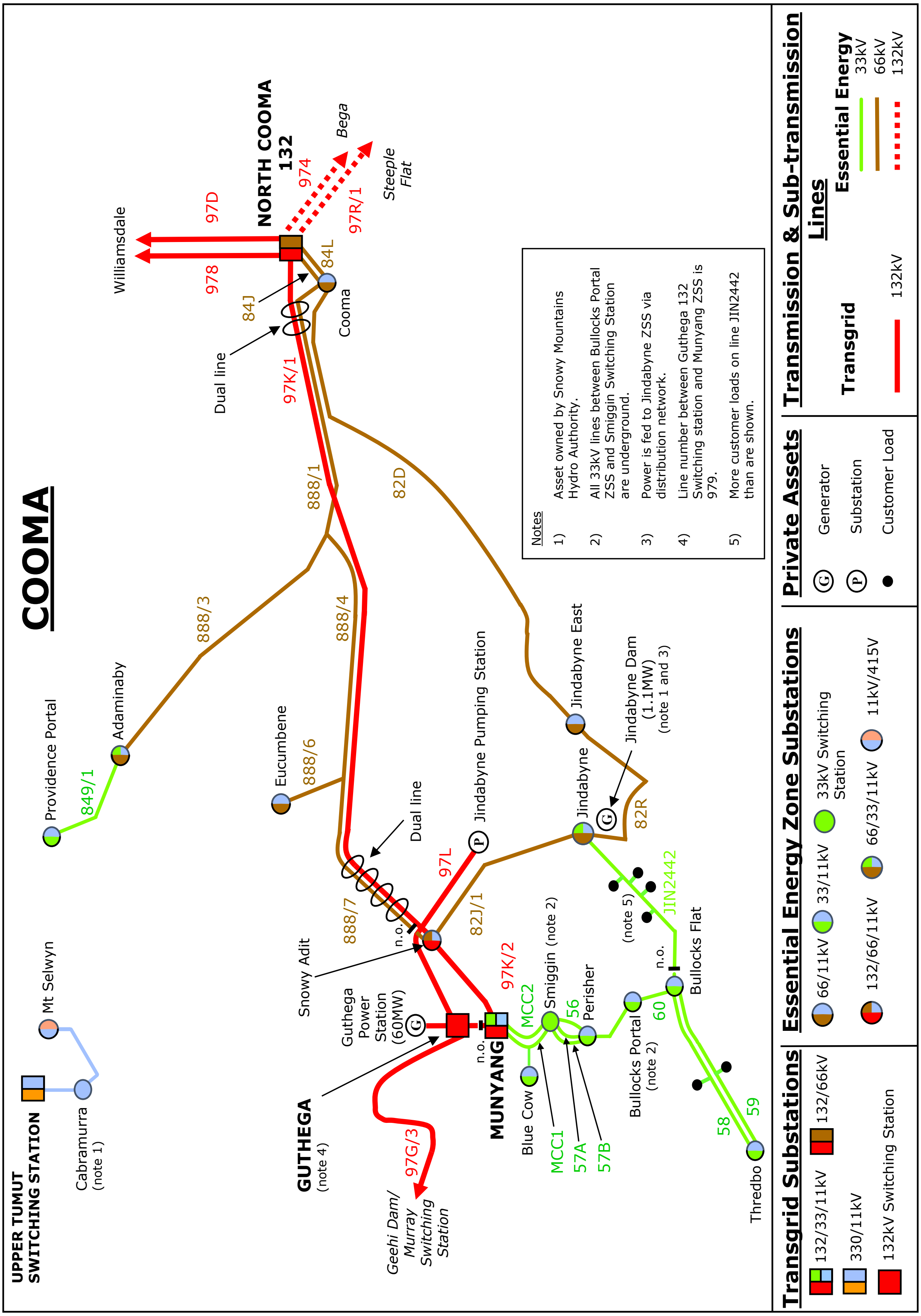
The Munyang area sub-transmission system is supplied from Transgrid's sub-transmission substation at Munyang. The majority of the Snowy Mountains winter ski resorts are supplied from the Munyang sub-transmission substation.

Essential Energy takes supply at 11kV from Snowy Mountains Hydro at the Murray transmission substation to supply the Khancoban township.

2.4.36 UPPER TUMUT

There are no zone substations in the Upper Tumut area, the loads it supplies are located in the South Eastern region.

The Upper Tumut area distribution system is supplied from a new 330/11kV transformer at Transgrid's Upper Tumut Switching Station. Essential Energy takes supply at 11kV for Cabramurra and the Selwyn resort and ski fields.


COOMA
UPPER TUMUT SWITCHING STATION
Cabramurra
(note 1)
Mt Selwyn
Providence Portal
849/1
Adaminaby
888/3
Williamsdale
97D
978
NORTH COOMA 132
974
Bega
97R/1
Steeple Flat
84L
84J
Cooma
Dual line
97K/1
888/1
82D
888/4
Eucumbene
888/6
888/7
Dual line
n.o.
Snowy Adit
97L
P Jindabyne Pumping Station
82J/1
Jindabyne East
Jindabyne
Jindabyne Dam (1.1MW) (note 1 and 3)
82R
(note 5)
JIN2442
GUTHEGA
(note 4)
Guthega Power Station (60MW)
97G/3
Geehi Dam/ Murray Switching Station
97K/2
n.o.
MUNYANG
MCC2
Blue Cow
Smiggin (note 2)
MCC1
57A
57B
56
Perisher
Bullocks Portal (note 2)
60
n.o.
Bullocks Flat
58
59
Thredbo
Notes
1) Asset owned by Snowy Mountains Hydro Authority.
2) All 33kV lines between Bullocks Portal ZSS and Smiggin Switching Station are underground.
3) Power is fed to Jindabyne ZSS via distribution network.
4) Line number between Guthega 132 Switching station and Munyang ZSS is 979.
5) More customer loads on line JIN2442 than are shown.
Transgrid Substations
132/33/11kV
132/66kV
330/11kV
132kV Switching Station
Essential Energy Zone Substations
66/11kV
33/11kV
33kV Switching Station
132/66/11kV
66/33/11kV
11kV/415V
Private Assets
G Generator
P Substation
Customer Load
Transmission & Sub-transmission Lines
Transgrid
132kV
Essential Energy
33kV
66kV
132kV

2.4.37 BEGA

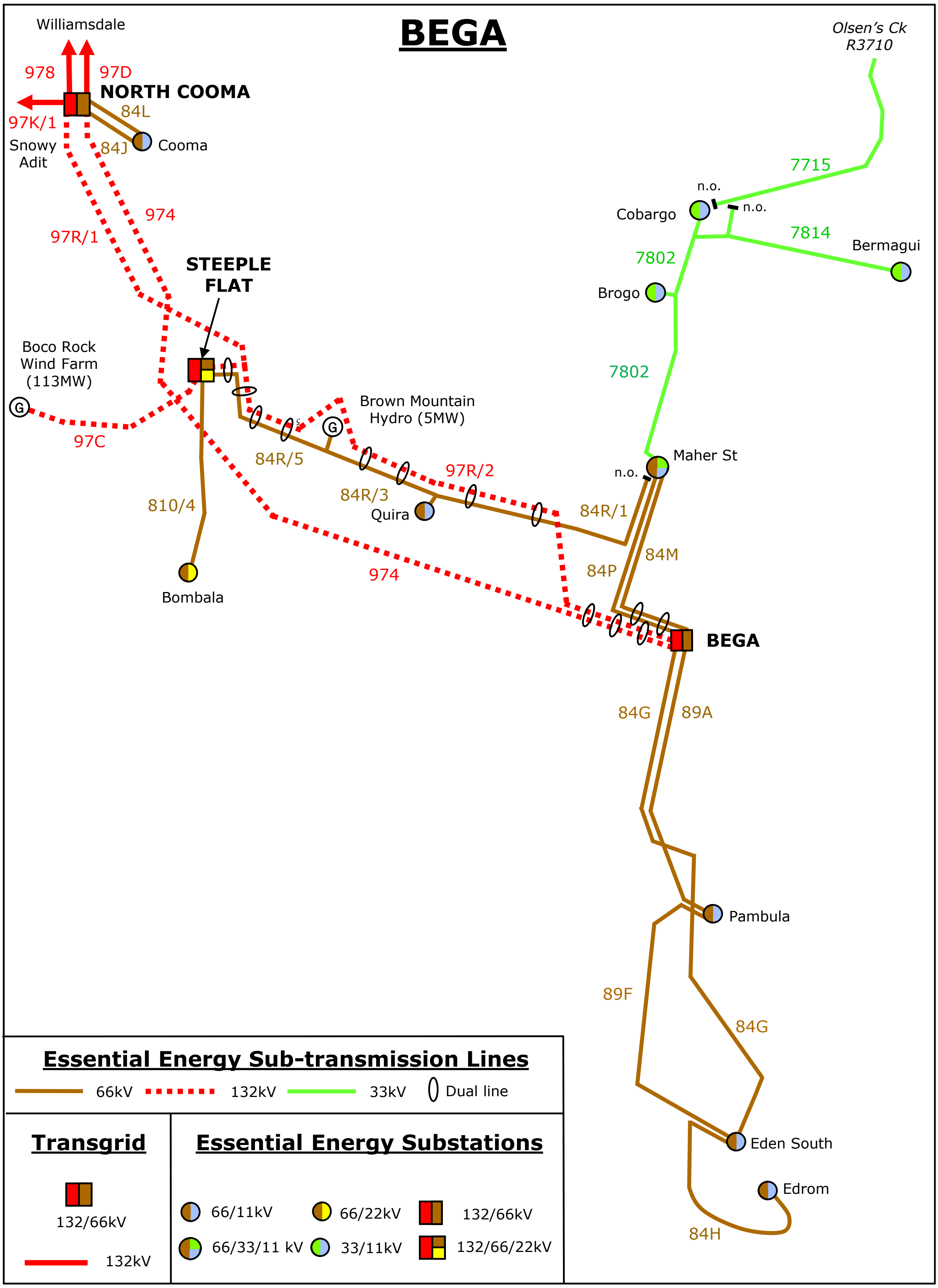
All zone substations in the Bega area are in the South Eastern region.

Essential Energy's Bega sub-transmission substation is supplied from Transgrid's Cooma 132/66kV sub-transmission substation via two Essential Energy 132kV transmission lines.

2.4.38 STEEPLE FLAT

All zone substations in the Steeple Flat area are in the South Eastern region.

The Steeple Flat 132/66/22kV substation is owned by Essential Energy. It receives supply via a tee off the Essential Energy 97R Cooma to Bega 132kV line. The 132/66/11kV transformer provides supply for the 66kV network to Bombala 66/22kV zone substation and connection for the Brown Mountain Generation. An 11/22kV transformer at Steeple Flat provides 22kV supply for local distribution load. Steeple Flat also provides connection for the Boco Rock wind farm to the 132kV network.

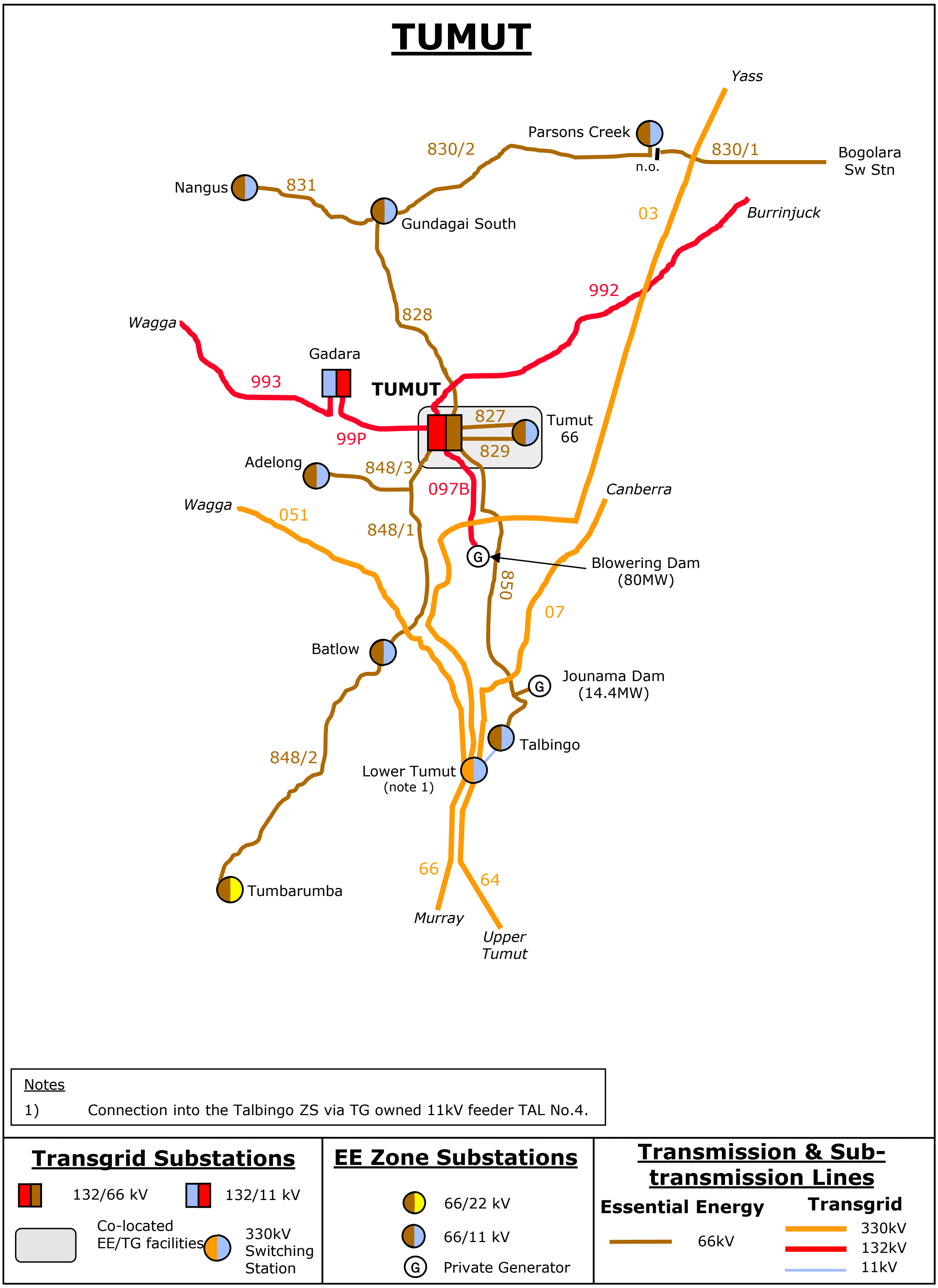

BEGA
Williamsdale
978
97D
NORTH COOMA
84L
97K/1
Snowy Adit
84J
Cooma
974
97R/1
STEEPLE FLAT
Boco Rock Wind Farm (113MW)
G
97C
84R/5
Brown Mountain Hydro (5MW)
G
84R/3
Quira
97R/2
810/4
Bombala
974
84R/1
84P
84M
Maher St
n.o.
7802
Brogo
7802
Cobargo
n.o.
n.o.
7715
7814
Bermagui
Olsen's Ck R3710
BEGA
84G
89A
Pambula
89F
84G
Eden South
Edrom
84H
Essential Energy Sub-transmission Lines
66kV
132kV
33kV
Dual line
Transgrid
132/66kV
132kV
Essential Energy Substations
66/11kV
66/22kV
132/66kV
66/33/11 kV
33/11kV
132/66/22kV

2.4.39 TUMUT

All zone substations in the Tumut area are in the Riverina Slopes region.

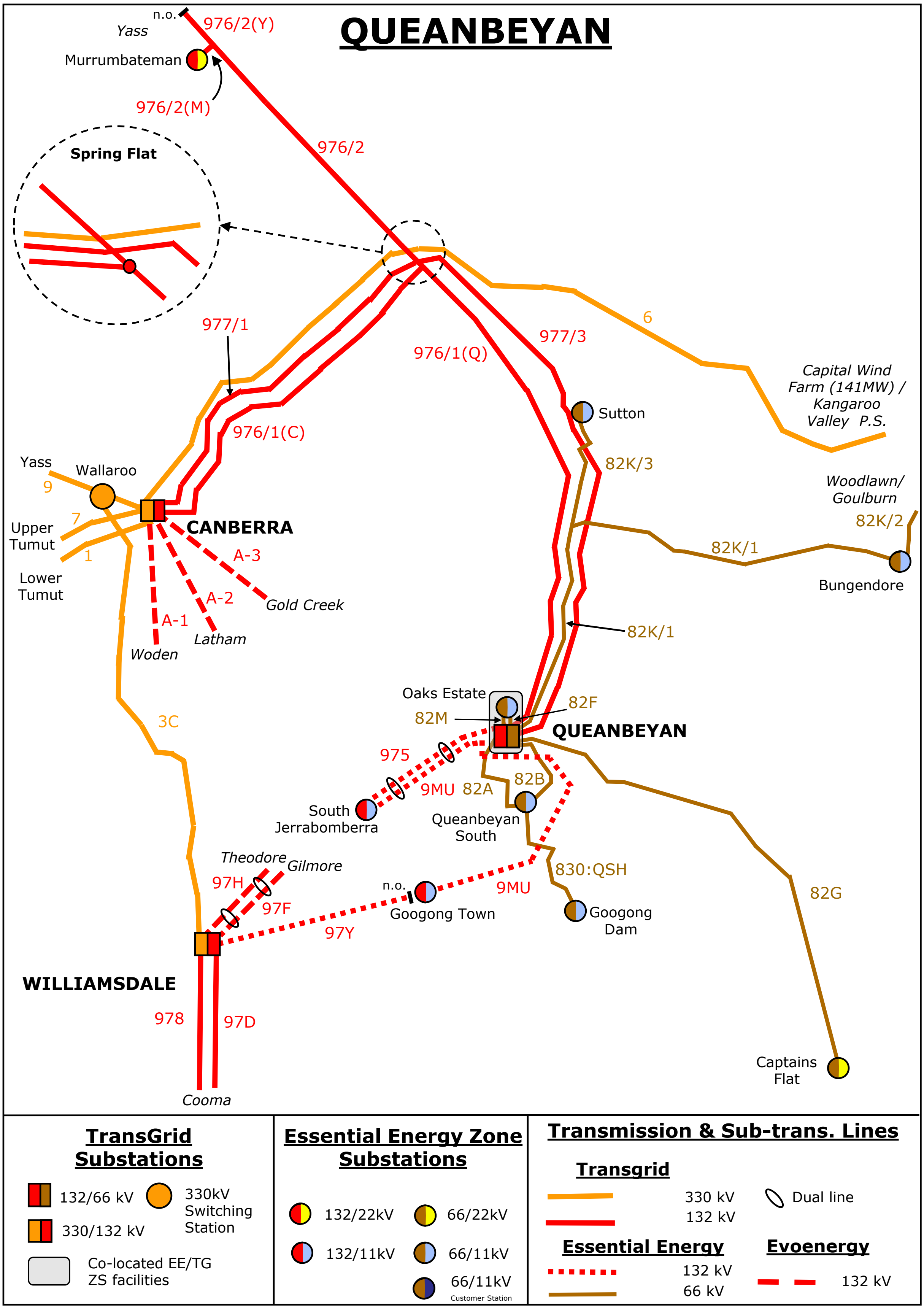
The Tumut area sub-transmission system is supplied from Transgrid's 132/66kV sub-transmission substation.

A 15MW hydro generator is located at Jounama Dam and is connected to the Transgrid Tumut 132/66kV sub-transmission substation at 66kV via feeder 850:TAL.


TUMUT
Yass
Parsons Creek
830/2
830/1
n.o.
Bogolara Sw Stn
Nangus
831
Gundagai South
03
Burrinjuck
992
828
Wagga
Gadara
993
TUMUT
827
Tumut 66
99P
829
Adelong
848/3
097B
Canberra
Wagga
051
848/1
G
Blowering Dam (80MW)
850
07
Batlow
Jounama Dam (14.4MW)
Talbingo
848/2
Lower Tumut (note 1)
66
64
Tumbarumba
Murray
Upper Tumut
Notes
1) Connection into the Talbingo ZS via TG owned 11kV feeder TAL No.4.
Transgrid Substations
132/66 kV
132/11 kV
Co-located EE/TG facilities
330kV Switching Station
EE Zone Substations
66/22 kV
66/11 kV
Private Generator
Transmission & Sub-transmission Lines
Essential Energy
66kV
Transgrid
330kV
132kV
11kV

2.4.40 QUEANBEYAN

All zone substations in the Queanbeyan area are in the South Eastern region. The Queanbeyan area sub-transmission system is supplied from Transgrid's 132/66kV sub-transmission substation.



2.4.41 GOULBURN

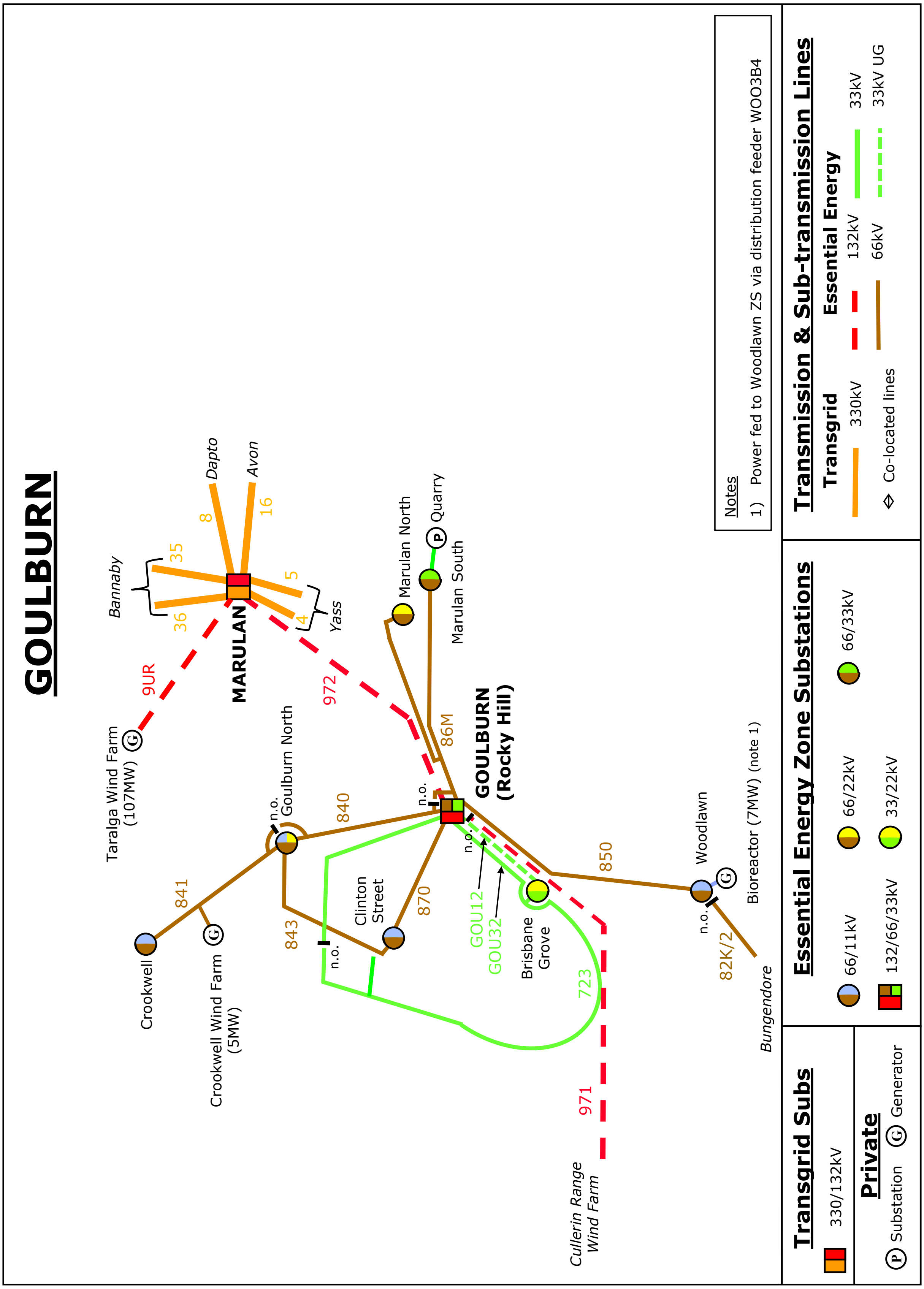
All zone substations in the Goulburn area are in the South Eastern region.

Essential Energy's Goulburn (Rocky Hill) 132/66/33kV substation is supplied via Essential Energy's 132kV transmission lines from Transgrid's sub-transmission substations at Marulan and Yass respectively.

A 7MW biomass generator is located at Woodlawn Bioreactor and is connected to the Woodlawn 66/11kV zone substation at 11kV via feeder WOO8642.

A 5MW wind generator is located at Crookwell wind farm and is connected to the Goulburn 132/66kV sub-transmission substation at 66kV via feeders 841:GBN and 840:GOU.

A 107MW wind generator is located at Taralga wind farm and is connected to the Transgrid Marulan 330/1 32kV sub-transmission substation at 132kV via feeder 9UR.

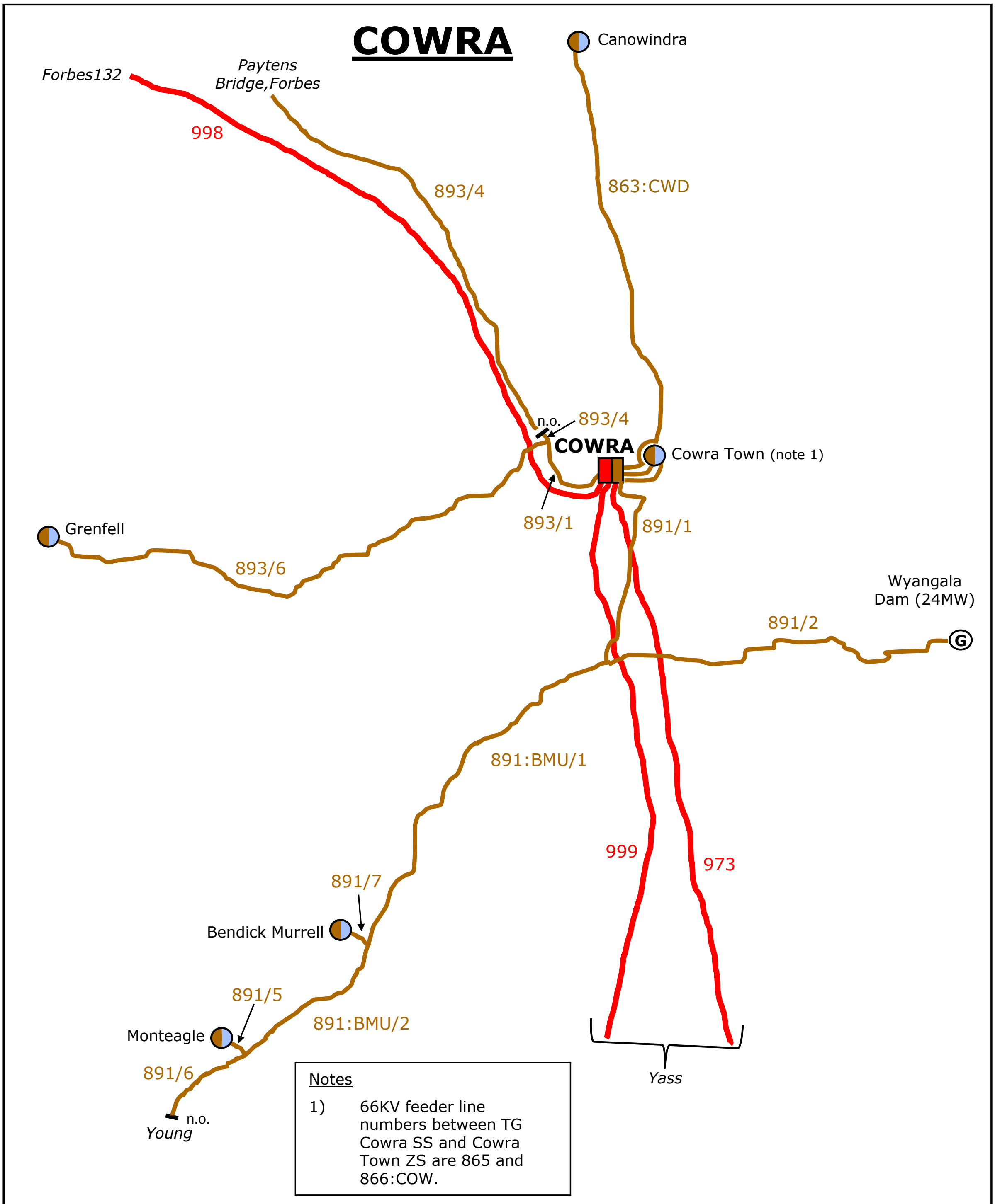

GOULBURN
Taralga Wind Farm (107MW)
9UR
MARULAN
Bannaby
35
36
8
Dapto
16
Avon
5
4
Yass
972
Marulan North
Quarry
Marulan South
86M
GOULBURN (Rocky Hill)
n.o.
Goulburn North
840
841
Crookwell
Crookwell Wind Farm (5MW)
843
n.o.
Clinton Street
870
n.o.
GOU12
GOU32
Brisbane Grove
723
850
Woodlawn
Bioreactor (7MW) (note 1)
n.o.
82K/2
Bungendore
971
Cullerin Range Wind Farm
Notes
1) Power fed to Woodlawn ZS via distribution feeder WOO3B4
Transgrid Subs
330/132kV
Private
Substation
Generator
Essential Energy Zone Substations
66/11kV
66/22kV
66/33kV
132/66/33kV
33/22kV
Transmission & Sub-transmission Lines
Transgrid
330kV
Essential Energy
132kV
33kV
66kV
33kV UG
Co-located lines

2.4.42 COWRA

Zone substations in the Cowra area are spread across both the Central Tablelands and Riverina Slopes regions.

The Cowra area sub-transmission system is supplied from Transgrid's Cowra 132/66kV sub-transmission substation. Normal 66kV system operation supplies from Cowra to Young open point and includes Bendick Murrell, Monteagle and connection to Wyangala Power Station.

A 24MW hydro generator is located at Wyangala Dam and is connected to the Transgrid Cowra 132/66kV sub-transmission substation at 66kV via feeder 891.



Notes

1) 66KV feeder line numbers between TG Cowra SS and Cowra Town ZS are 865 and 866:COW.

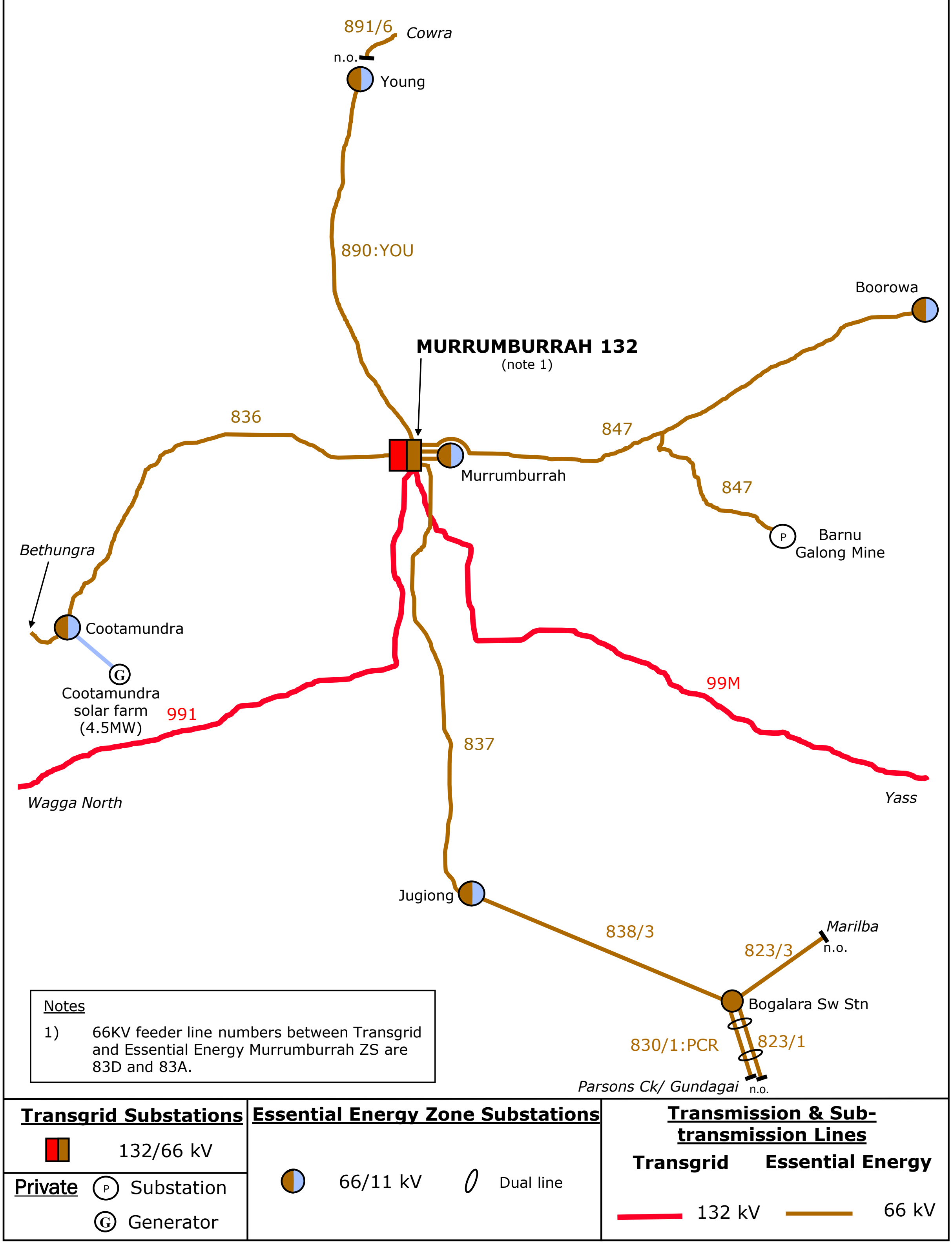
Transgrid Substations	EE Zone Substations	Transmission & Sub-transmission Lines	
132/66 kV	66/11 kV	Transgrid	Essential Energy
Private — G Generator		132kV	66kV

2.4.43 MURRUMBURRAH

All zone substations in the Murrumburrah area are in the Riverina Slopes region. The Harden-Murrumburrah area sub-transmission system is supplied from Transgrid's 132/66kV sub-transmission substation at Murrumburrah.

A 4.5MW solar generator is located at Cootamundra on the 11kV network.

HARDEN-MURRUMBURRAH



2.4.44 YASS

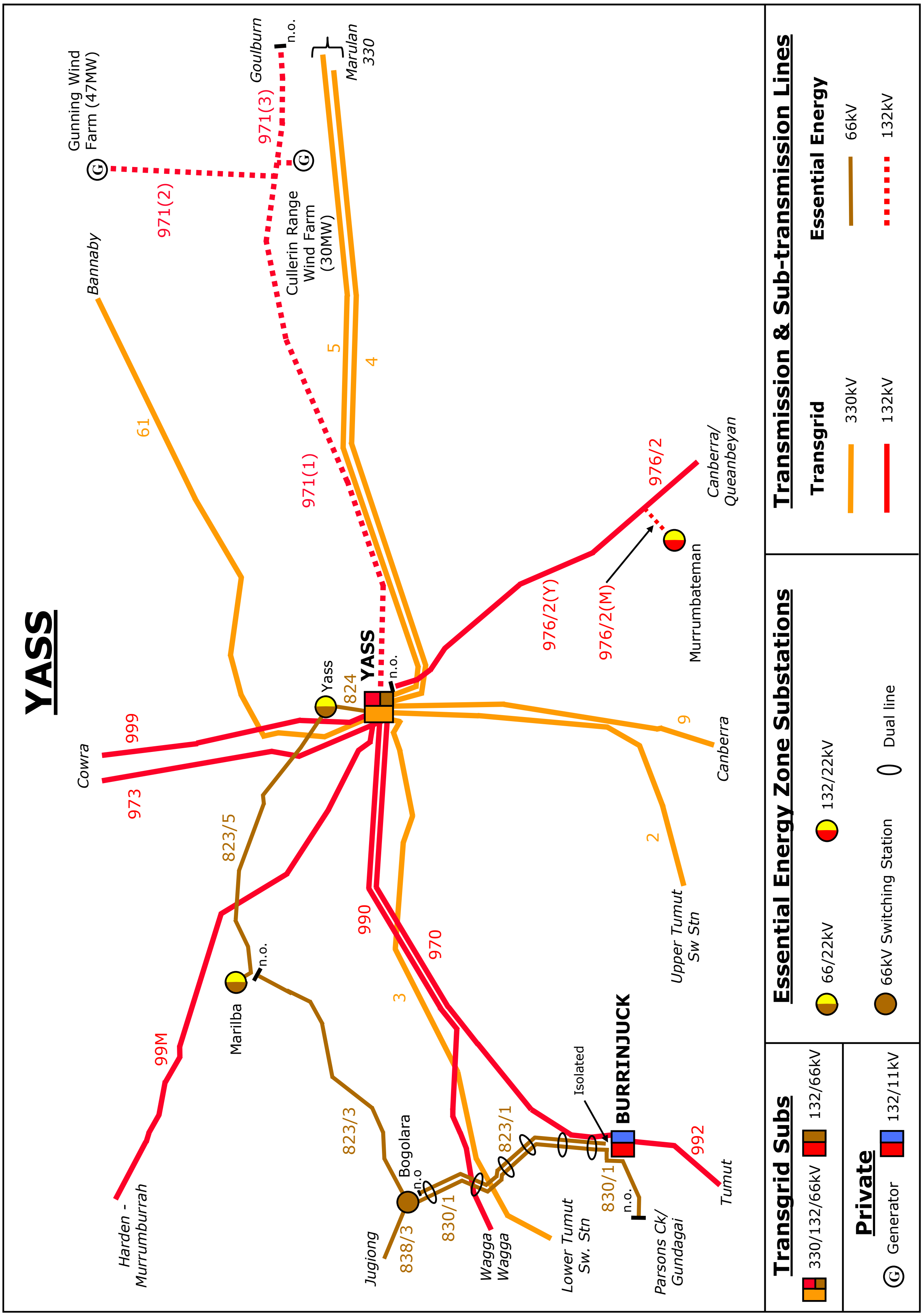
All zone substations in the Yass area are in the South Eastern region.

The Yass area sub-transmission system is supplied from Transgrid's 330/132/66kV sub-transmission substation.

A 30MW wind generator is located at Cullerin Range wind farm and is connected to the Transgrid Yass 330/132/66kV sub-transmission substation at 132kV via feeder 971.

A 47MW wind generator is located at Gunning wind farm and is also connected to the Transgrid Yass 330/132/66kV sub-transmission substation at 132kV via feeder 971.

There are multiple load transfer points in the Yass area to other zone substations that can be utilised with the loss of a single Yass transformer.


YASS
Cowra
999
973
Yass
824
YASS
n.o.
Bannaby
61
971(2)
Gunning Wind Farm (47MW)
Goulburn
971(3)
n.o.
Marulan 330
Cullerin Range Wind Farm (30MW)
5
4
971(1)
976/2
Canberra/ Queanbeyan
Murrumbateman
976/2(Y)
976/2(M)
9
Canberra
2
Upper Tumut Sw Stn
823/5
990
970
3
Marilba
n.o.
99M
Harden - Murrumburrah
823/3
Bogolara
n.o
Jugiong
838/3
830/1
Wagga Wagga
823/1
Lower Tumut Sw. Stn
Isolated
BURRINJUCK
830/1
n.o.
Parsons Ck/ Gundagai
992
Tumut
Transgrid Subs
330/132/66kV
132/66kV
Private
Generator
132/11kV
Essential Energy Zone Substations
66/22kV
132/22kV
66kV Switching Station
Dual line
Transmission & Sub-transmission Lines
Transgrid
330kV
132kV
Essential Energy
66kV
132kV

2.4.45 TEMORA

Zone substations in the Temora area are spread across both the Riverina Slopes and Central regions.

Essential Energy's Temora 132/66kV sub-transmission substation is supplied from Transgrid's Wagga Wagga North 132/66kV sub-transmission substation via two Essential Energy 132kV transmission lines.

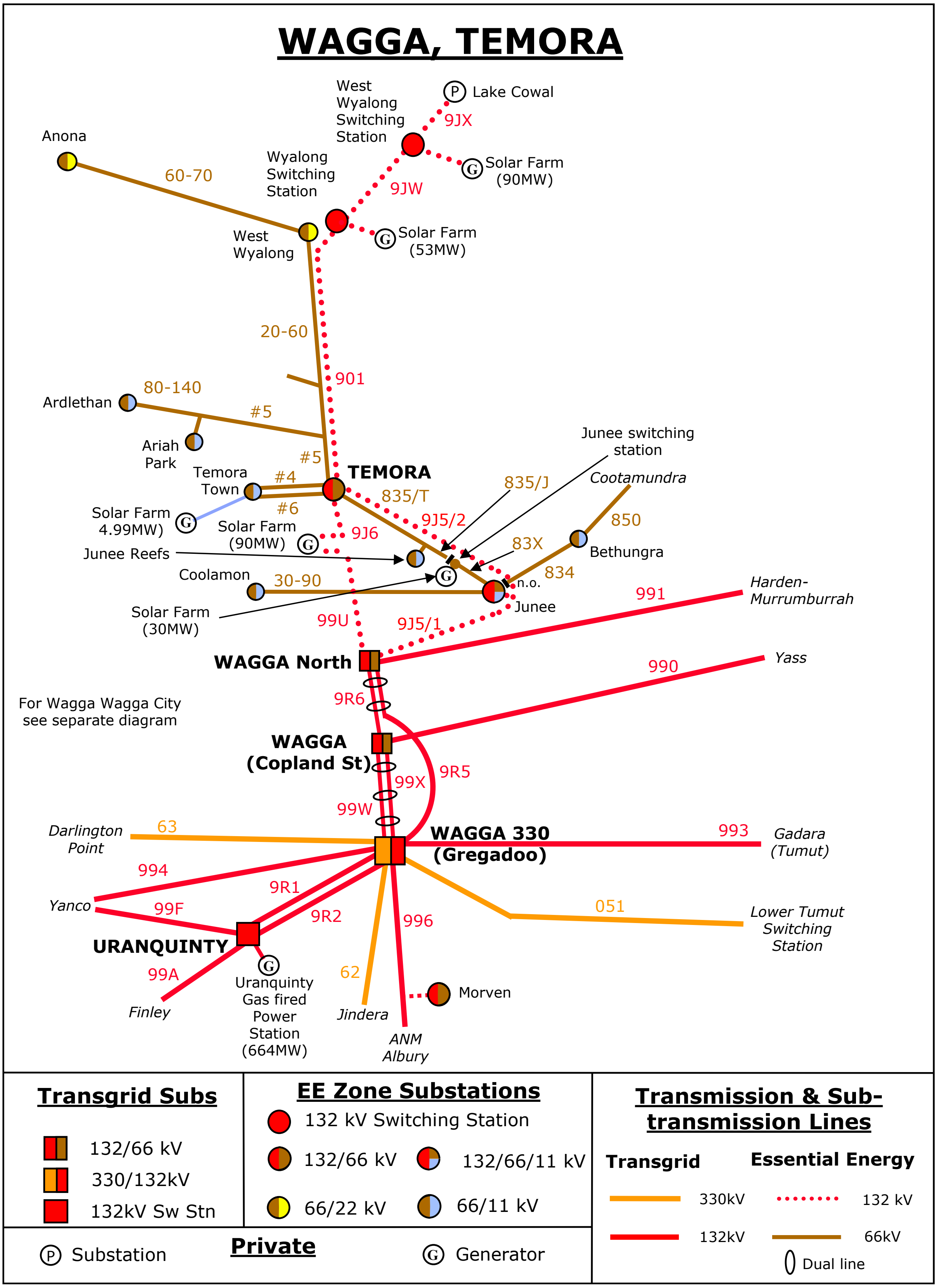
A 90MW solar generator is located at Sebastopol and is connected to the Transgrid Wagga North 132/66kV sub-transmission substation at 132kV via feeder 99U.

A 90MW solar generator is located at West Wyalong and is connected to the Temora 132/66kV sub-transmission substation at 132kV via feeder 9JW.

A 53MW solar generator is located at Wyalong and is connected to the Temora 132/66kV sub-transmission substation at 132kV via feeder 901.

A 30MW solar generator is located at Junee on the 11kV network.

A 4.99MW solar generator is located at Temora on the 11kV network.



WAGGA, TEMORA
West Wyalong Switching Station
Lake Cowal
9JX
Solar Farm (90MW)
Anona
60-70
Wyalong Switching Station
9JW
West Wyalong
Solar Farm (53MW)
20-60
901
Ardlethan
80-140
#5
Ariah Park
#5
Temora Town
#4
TEMORA
835/T
Junee switching station
835/J
Cootamundra
850
Solar Farm 4.99MW)
#6
Solar Farm (90MW)
9J6
9J5/2
83X
Bethungra
Junee Reefs
Coolamon
30-90
834
n.o.
Junee
Solar Farm (30MW)
99U
9J5/1
991
Harden-Murrumburrah
WAGGA North
990
Yass
For Wagga Wagga City see separate diagram
9R6
WAGGA (Copland St)
9R5
99X
99W
Darlington Point
63
WAGGA 330 (Gregadoo)
993
Gadara (Tumut)
994
9R1
Yanco
99F
9R2
996
051
Lower Tumut Switching Station
URANQUINTY
99A
Finley
Uranquinty Gas fired Power Station (664MW)
62
Jindera
Morven
ANM Albury
Transgrid Subs
132/66 kV
330/132kV
132kV Sw Stn
EE Zone Substations
132 kV Switching Station
132/66 kV
132/66/11 kV
66/22 kV
66/11 kV
Transmission & Sub-transmission Lines
Transgrid
Essential Energy
330kV
132 kV
132kV
66kV
Dual line
Substation
Private
Generator

2.4.46 WAGGA NORTH

All zone substations in the Wagga North area are in the Riverina Slopes region.

The Wagga Wagga area sub-transmission system is supplied from two separate Transgrid 132/66kV sub-transmission substations at Wagga Wagga (Copland St) and Wagga North.

The transmission system emanating from Wagga North supplies many smaller outlying areas.

A 2.2MW generator is connected to Bomen zone substation on the 11kV network.

2.4.47 WAGGA WAGGA (COPLAND ST)

Zone substations in the Wagga Wagga area are spread across both the Riverina Slopes and Murray regions.

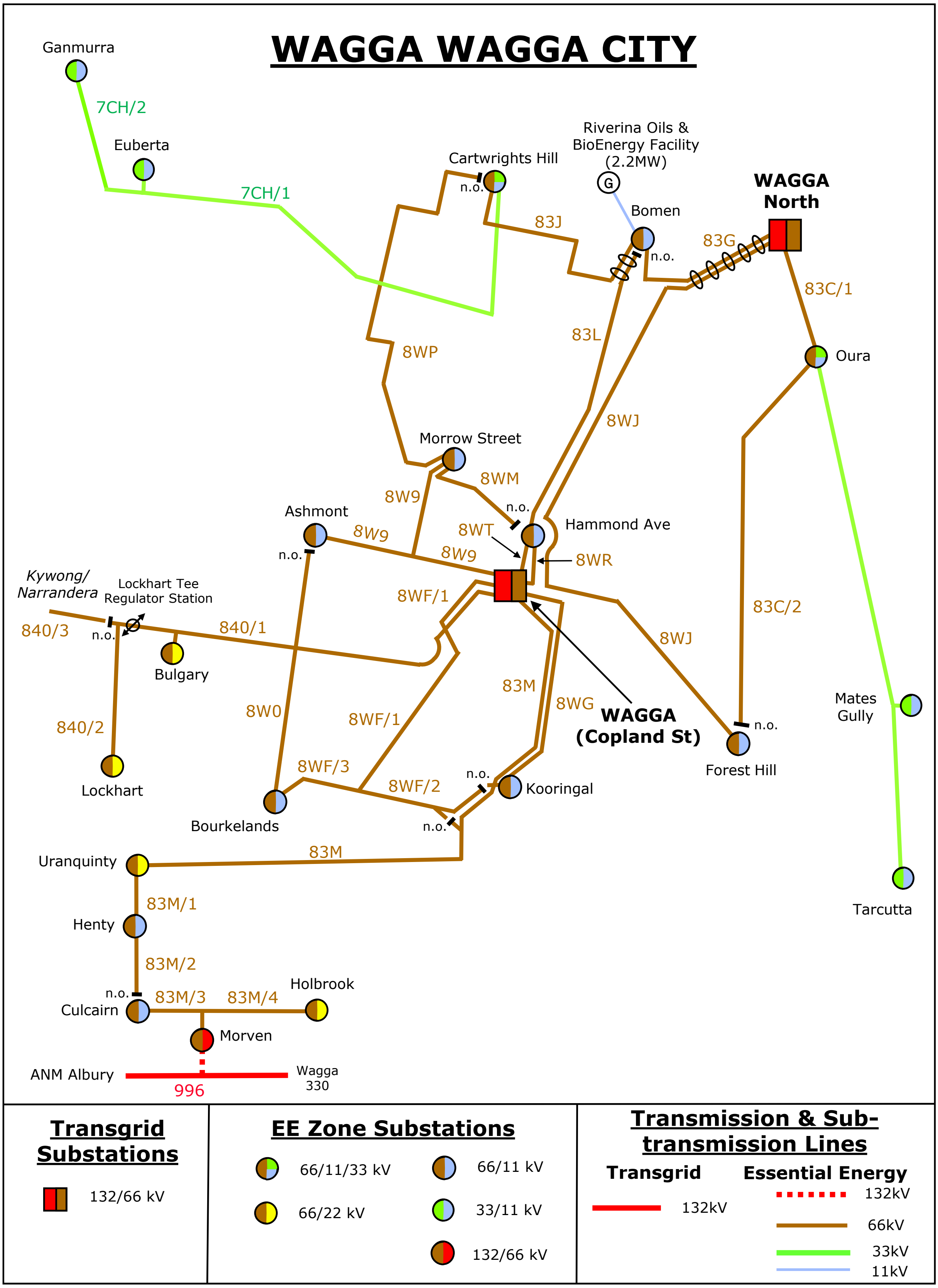
The Wagga Wagga area sub-transmission system is supplied from two separate Transgrid 132/66kV sub-transmission substations at Wagga Wagga (Copland St) and Wagga North.

The transmission system emanating from Wagga Wagga (Copland St) supplies the majority of the Wagga Wagga city load as well as supplying the areas as far south as Holbrook and as far west as Lockhart.

2.4.48 MORVEN

All zone substations in the Morven area are in the Murray region.

The Morven 132/66kV substation is owned by Essential Energy. It receives supply via a tee off the Transgrid Wagga Wagga 330kV (Gregadoo) – Albury (ANM) 132kV line 996. Culcairn 66/11kV and Holbrook 66/22kV zone substations take normal 66kV supply from Morven and backup 66kV supply from Transgrid's Wagga Wagga 132/66kV substation (Copland St) on the Essential Energy 66kV line 83M via Uranquinty and Holbrook.


WAGGA WAGGA CITY
Ganmurra
7CH/2
Euberta
7CH/1
Cartwrights Hill
n.o.
Riverina Oils & BioEnergy Facility (2.2MW)
G
Bomen
n.o.
WAGGA North
83J
83G
83C/1
83L
Oura
8WP
8WJ
Morrow Street
8WM
8W9
n.o.
Ashmont
8W9
8WT
Hammond Ave
n.o.
8W9
8WR
Kywong/ Narrandera
Lockhart Tee Regulator Station
840/3
n.o.
840/1
8WF/1
Bulgary
83C/2
8WJ
840/2
8W0
8WF/1
83M
8WG
WAGGA (Copland St)
Mates Gully
n.o.
Forest Hill
Lockhart
8WF/3
8WF/2
n.o.
Kooringal
Bourkelands
n.o.
83M
Uranquinty
Tarcutta
83M/1
Henty
83M/2
Holbrook
n.o.
83M/3
83M/4
Culcairn
Morven
ANM Albury
Wagga 330
996
Transgrid Substations
132/66 kV
EE Zone Substations
66/11/33 kV
66/11 kV
66/22 kV
33/11 kV
132/66 kV
Transmission & Sub-transmission Lines
Transgrid
Essential Energy
132kV
132kV
66kV
33kV
11kV

2.4.49 ALBURY

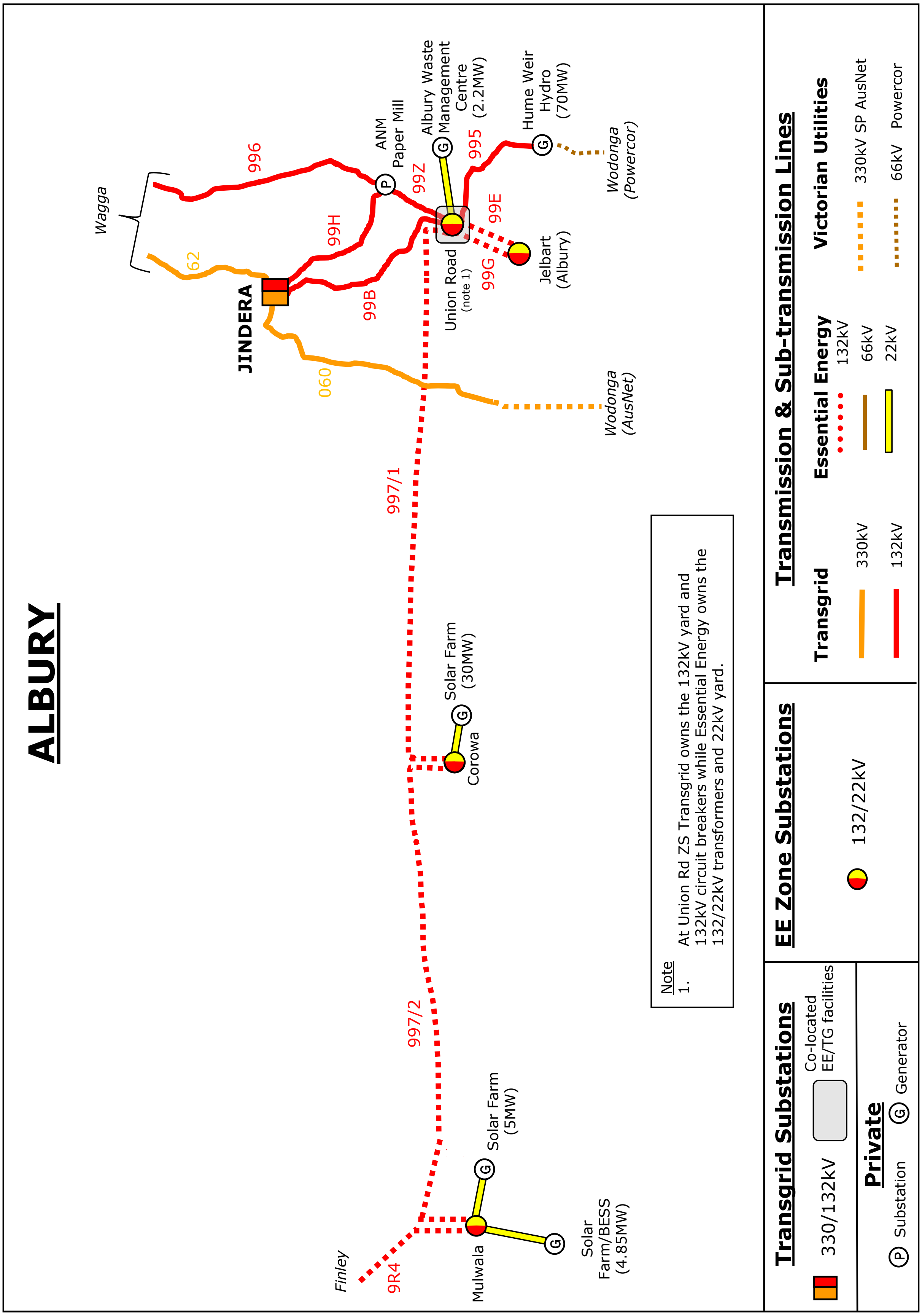
All zone substations in the Albury area are in the Murray region.

The Albury area 132kV sub-transmission system is supplied from Transgrid's Jindera 330/132kV sub-transmission substation with backup via Transgrid's 132kV line from ANM substation Ettamogah.

The Essential Energy substation of Corowa and Mulwala are supplied at 132kV from the Essential Energy 132kV powerlines connecting the Union Road substation to Transgrid's Finley 132/66kV sub-transmission substation.

A 30MW solar thermal generator is located at Corowa on the 22kV network.

A 5MW solar generator and 4.85MW combined solar generator and BESS is located at Mulwala on the 22kV network.


ALBURY
Wagga
996
62
JINDERA
060
99H
99B
ANM
Paper Mill
99Z
Albury Waste
Management
Centre
(2.2MW)
995
Hume Weir
Hydro
(70MW)
Wodonga
(Powercor)
99E
Jelbart
(Albury)
99G
Union Road
(note 1)
Wodonga
(AusNet)
997/1
Solar Farm
(30MW)
Corowa
997/2
Solar Farm
(5MW)
Finley
9R4
Mulwala
Solar
Farm/BESS
(4.85MW)
Note
1. At Union Rd ZS Transgrid owns the 132kV yard and 132kV circuit breakers while Essential Energy owns the 132/22kV transformers and 22kV yard.
Transgrid Substations
330/132kV
Co-located
EE/TG facilities
Private
Substation
Generator
EE Zone Substations
132/22kV
Transmission & Sub-transmission Lines
Transgrid
330kV
132kV
Essential Energy
132kV
66kV
22kV
Victorian Utilities
330kV SP AusNet
66kV Powercor

2.4.50 FINLEY

All zone substations in the Finley area are in the Murray region.

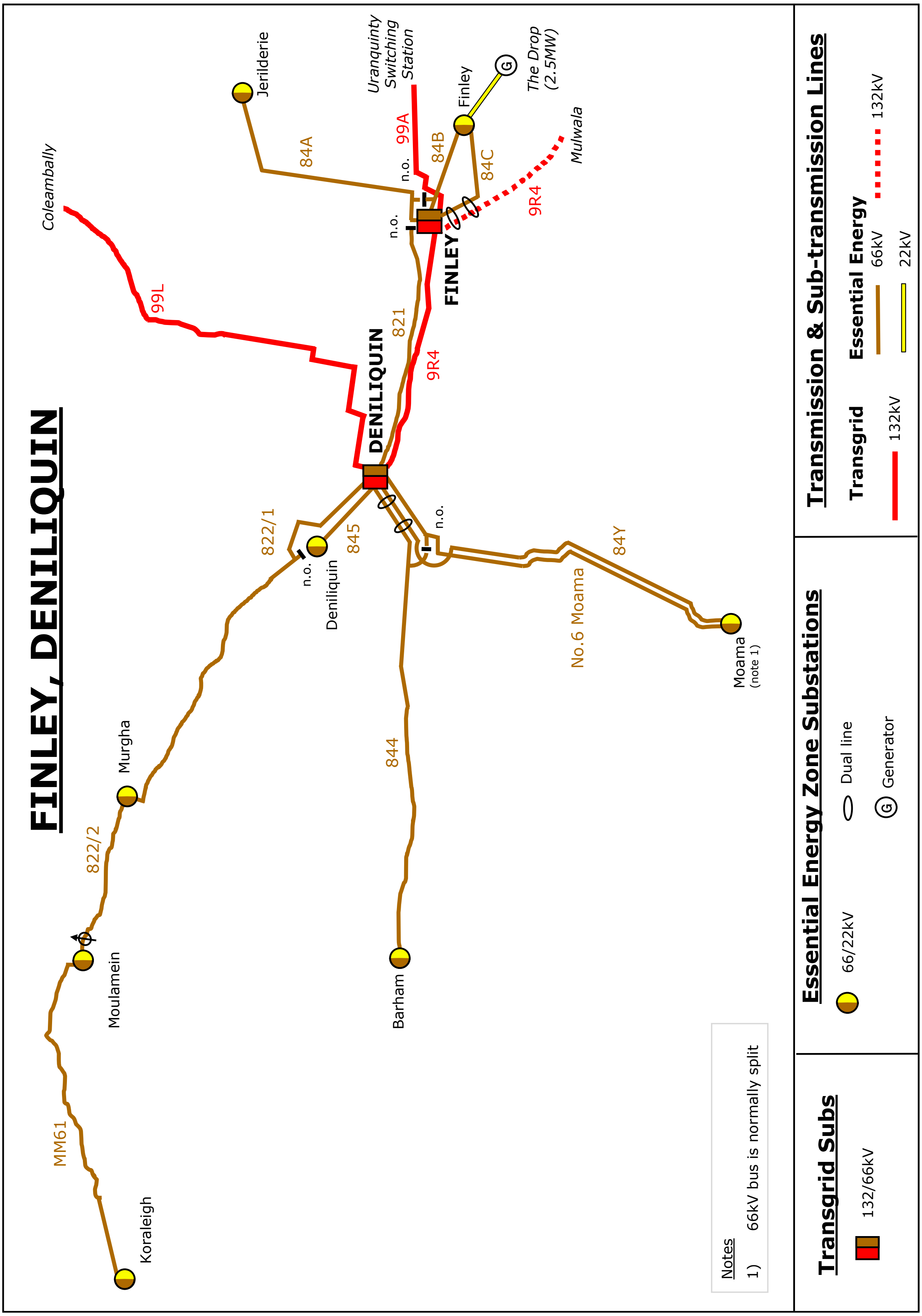
The Finley area sub-transmission system is supplied from Transgrid's 132/66kV sub-transmission substation.

A 2.5MW hydro generator is located at The Drop and is connected to the Finley 66/22kV zone substation at 22kV via feeder FIN42.

2.4.51 DENILIQUIN

All zone substations in the Deniliquin area are in the Murray region.

The Deniliquin area sub-transmission system is supplied from Transgrid's 132/66kV sub-transmission substation.


FINLEY, DENILIQUIN
Coleambally
99L
Jerilderie
84A
Uranquinty Switching Station
99A
n.o.
84B
Finley
G
The Drop (2.5MW)
84C
Mulwala
9R4
n.o.
FINLEY
821
9R4
DENILIQUIN
822/1
845
n.o.
n.o.
Deniliquin
84Y
No.6 Moama
Moama (note 1)
844
Murgha
822/2
Moulamein
Barham
MM61
Koraleigh
Notes
1) 66kV bus is normally split
Transgrid Subs
132/66kV
Essential Energy Zone Substations
66/22kV
Dual line
Generator
Transmission & Sub-transmission Lines
Transgrid
132kV
Essential Energy
66kV
22kV
132kV

2.4.52 COLEAMBALLY

All zone substations in the Coleambally area are in the Central region.

Essential Energy's Coleambally 132/33kV sub-transmission substation is supplied from Transgrid's 132kV transmission powerlines 99L from Deniliquin and 99T from Darlington Point system.

2.4.53 DARLINGTON POINT

All zone substations in the Darlington Point area are in the Central region.

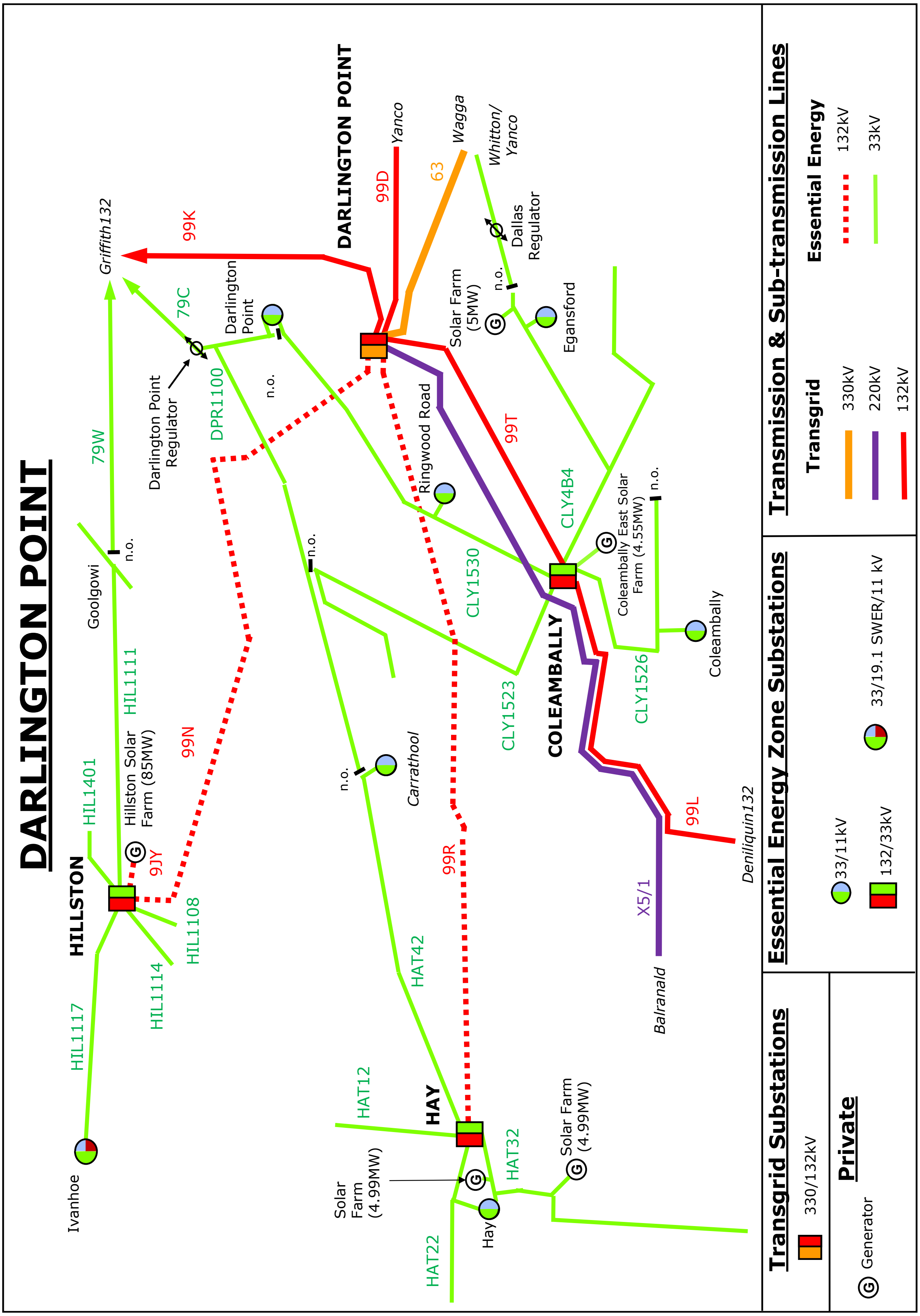
The Darlington Point area 132kV sub-transmission system is supplied from Transgrid's 330/132kV sub-transmission substation. Essential Energy owns the 132kV transmission lines supplying Hay and Hillston substations. The 33kV sub-transmission originates from these substations.

An 85MW solar generator is located at Hillston and is connected to the Hillston 132/66kV sub-transmission substation at 132kV via feeder 9JY.

A 5MW solar generator is located near Egansford and is connected to the Coleambally 132/33kV sub-transmission substation at 33kV via feeder CLY4B4.

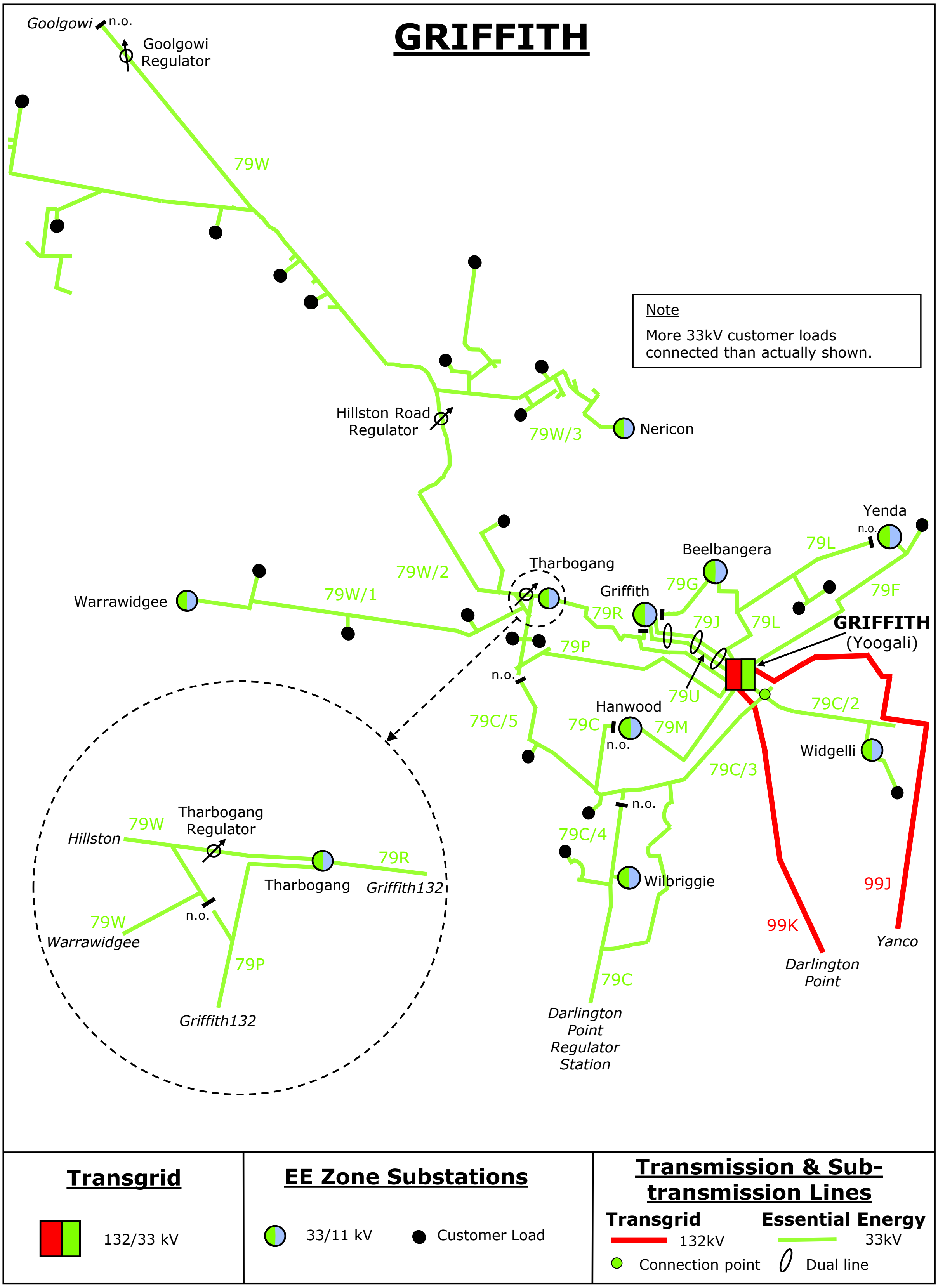
A 4.55MW solar generator is connected to Coleambally 132/33kV sub-transmission substation at 33kV.

Two 4.99MW solar generators are located near Hay and are connected to the Hay 132/33kV sub-transmission substation at 33kV via feeder HAT32.


DARLINGTON POINT
HILLSTON
HAY
COLEAMBALLY
DARLINGTON POINT
Ivanhoe
HIL1117
HIL1401
HIL1114
HIL1108
HIL1111
Hillston Solar Farm (85MW)
9JY
99N
Goolgowi
n.o.
79W
Griffith132
99K
79C
Darlington Point Regulator
DPR1100
Darlington Point
n.o.
Yanco
99D
Wagga
63
Whitton/ Yanco
Dallas Regulator
n.o.
Solar Farm (5MW)
Egansford
Ringwood Road
99T
CLY4B4
Coleambally East Solar Farm (4.55MW)
n.o.
CLY1530
CLY1523
CLY1526
Coleambally
n.o.
n.o.
Carrathool
99R
HAT42
HAT12
HAT32
HAT22
Solar Farm (4.99MW)
Solar Farm (4.99MW)
Hay
99L
Deniliquin132
X5/1
Balranald
Transgrid Substations
330/132kV
Private
Generator
Essential Energy Zone Substations
33/11kV
132/33kV
33/19.1 SWER/11 kV
Transmission & Sub-transmission Lines
Transgrid
330kV
220kV
132kV
Essential Energy
132kV
33kV

2.4.54 GRIFFITH

All zone substations in the Griffith area are in the Central region. The Griffith area sub-transmission system is supplied from Transgrid's 132/33kV sub-transmission substation.



2.4.55 YANCO

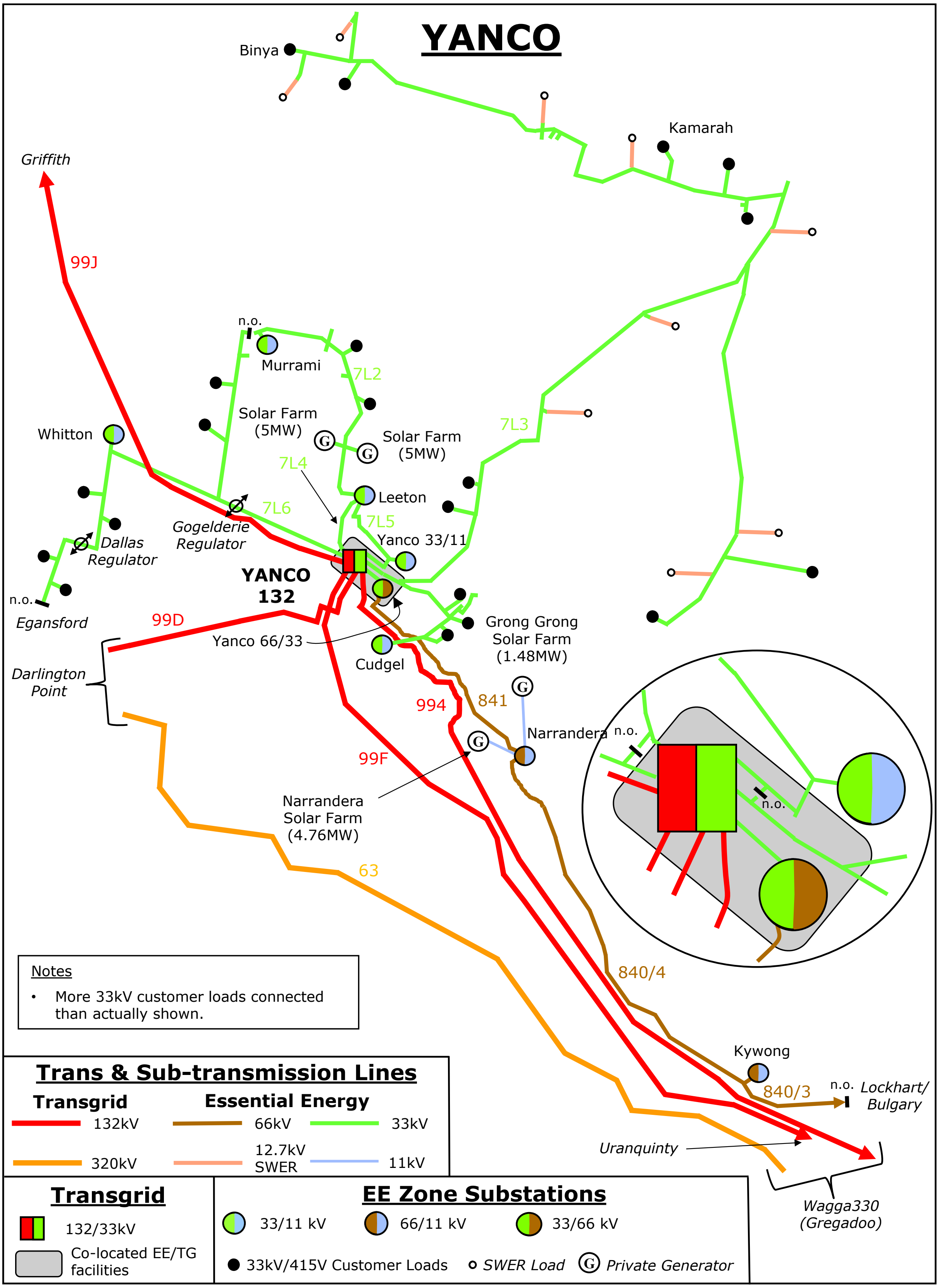
All zone substations in the Yanco area are in the Central region.

The Yanco area sub-transmission system is supplied from Transgrid's 132/33/66kV sub-transmission substation. The 66kV sub-transmission system originates from Transgrid's 132/33/66kV sub-transmission substation via an Essential Energy 33/66kV transformer.

Two 5MW solar generators are located near Leeton and are connected to the Yanco 132/33kV sub-transmission substation at 33kV via feeder 7L2.

A 4.76MW solar generator is connected to Narrandera zone substation on the 11kV network.

A 1.48MW solar generator is connected to Narrandera zone substation on the 11kV network.



YANCO
Binya
Kamarah
Griffith
99J
n.o.
Murrami
7L2
Solar Farm (5MW)
Solar Farm (5MW)
7L3
Whitton
7L4
Leeton
7L6
7L5
Gogelderie Regulator
Dallas Regulator
Yanco 33/11
YANCO 132
n.o.
Egansford
99D
Grong Grong Solar Farm (1.48MW)
Yanco 66/33
Cudgel
Darlington Point
994
841
Narrandera
n.o.
99F
Narrandera Solar Farm (4.76MW)
63
840/4
Notes
More 33kV customer loads connected than actually shown.
Kywong
840/3
n.o.
Lockhart/ Bulgary
Uranquinty
Wagga330 (Gregadoo)
Trans & Sub-transmission Lines
Transgrid
Essential Energy
132kV
66kV
33kV
320kV
12.7kV SWER
11kV
Transgrid
132/33kV
Co-located EE/TG facilities
EE Zone Substations
33/11 kV
66/11 kV
33/66 kV
33kV/415V Customer Loads
SWER Load
Private Generator

2.4.56 BURONGA

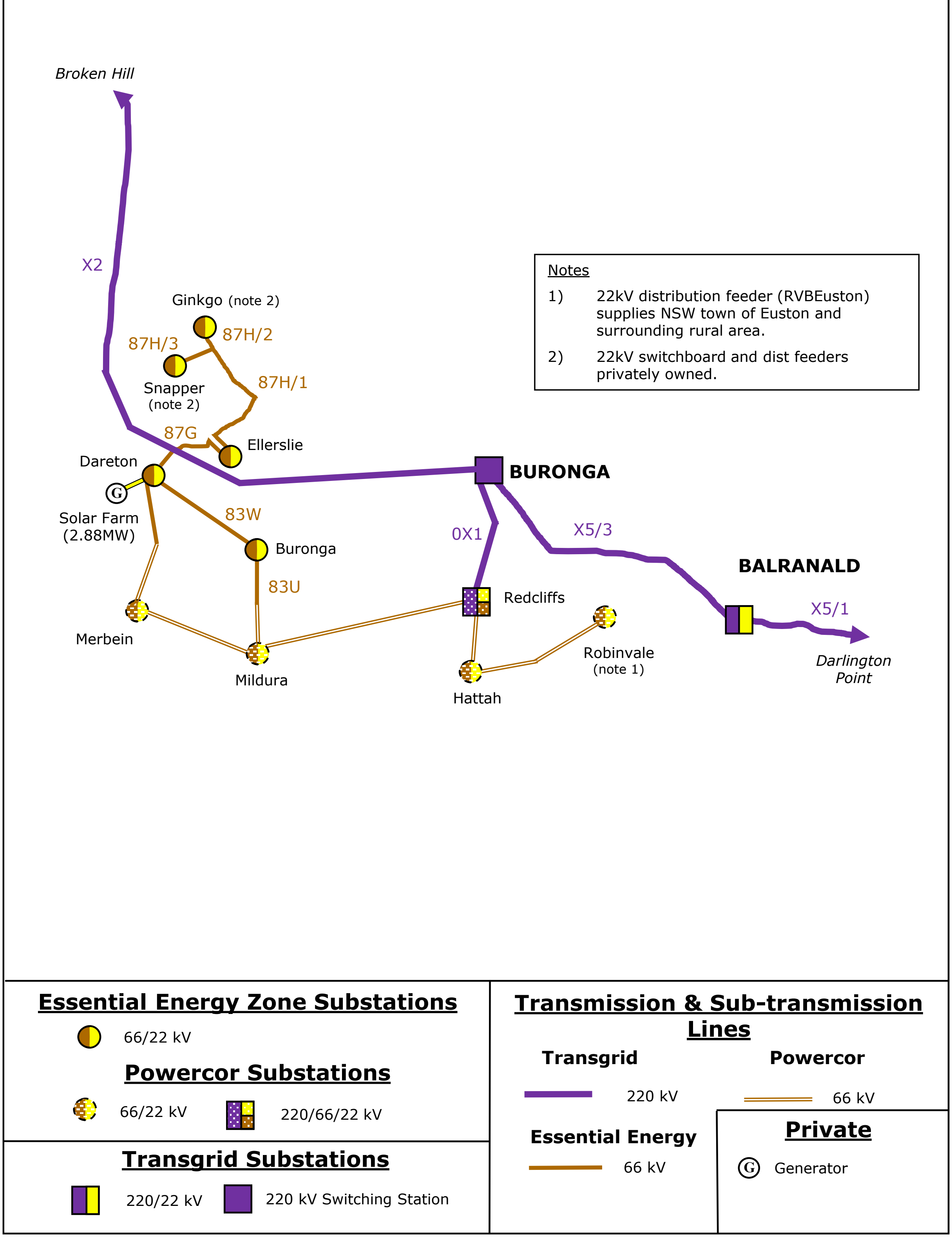
All zone substations in the Buronga area are in the Murray region.

Supply to the Dareton, Wentworth and Buronga areas originates from the Powercor 66kV sub-transmission substations at Merbein and Mildura in Victoria, which is in turn supplied from the Red Cliffs Victoria 220/66kV sub-transmission substation south east of Mildura.

The Balranald area is supplied from Transgrid's 220/22kV substation. Backup supply is seasonal limited via Moulamein 22kV system.

A 3.3MW solar generator is located at Dareton on the 22kV network.

BURONGA



Broken Hill
X2
Ginkgo (note 2)
87H/3
87H/2
Snapper
(note 2)
87H/1
87G
Ellerslie
Dareton
Solar Farm
(2.88MW)
83W
Buronga
83U
BURONGA
0X1
X5/3
BALRANALD
Redcliffs
X5/1
Robinvale
(note 1)
Merbein
Mildura
Hattah
Darlington
Point
Notes
1) 22kV distribution feeder (RVBEuston) supplies NSW town of Euston and surrounding rural area.
2) 22kV switchboard and dist feeders privately owned.
Essential Energy Zone Substations
66/22 kV
Powercor Substations
66/22 kV
220/66/22 kV
Transgrid Substations
220/22 kV
220 kV Switching Station
Transmission & Sub-transmission Lines
Transgrid
220 kV
Powercor
66 kV
Essential Energy
66 kV
Private
Generator

2.5 Future Proposed Connection Points and Zone Substations

Table 4: Future Transmission/Distribution Asset Demand Forecasts

ASSET	TYPE	KV	PROPOSED LOCATION	FORECAST		FORECAST (MVA)					ESTIMATED COMMISSIONING DATE
				SUMMER	PF	25/26	26/27	27/28	28/29	29/30	
				WINTER	PF	2026	2027	2028	2029	2030	
Kings Forest	Zone Substation	33/11	Kings Forest	Summer	0.99	0	2.0	3.0	4.0	4.0	Winter 2026
				Winter	1.00	2.0	3.0	4.0	5.0	5.0	
Brolgan	Zone Substation	132/11	Parkes	Summer	0.99	0	4.0	6.0	8.0	10.0	Winter 2026
				Winter	1.00	4.0	6.0	8.0	10.0	12.0	
9MW TG Parkes - Brolgan ZS	Connection Point	132	Parkes	Summer	0.99	0	4.0	6.0	8.0	10.0	Winter 2026
				Winter	1.00	4.0	6.0	8.0	10.0	12.0	
Sovereign Hills	Zone Substation	33/11	Port Macquarie	Summer	0.99	0	0	6.0	8.0	10.0	Winter 2027
				Winter	1.00	0	6.0	8.0	10.0	10.0	

2.6 Transmission – Distribution Connection Point Load Forecast

Connection point load forecasts are available in the data attachment DAPR 2025 BSP, ZS and Lines Extract Summary.xlsx. The embedded generation includes all major generation capacity but excludes the rooftop PV generation (which is shown against the individual zone substation forecasts).

2.7 Forecast of Reliability Target Performance

The 2024/25 financial year is the tenth year since the introduction of the Service Target Performance Incentive Scheme (STPIS) to Essential Energy. The STPIS provides incentives for improved normalised reliability performance and penalises reduced normalised reliability performance against System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) targets.

The following targets have been set by the AER for the network performance component of STPIS for the period 2024/25 - 2028/29. These targets are based on the average performance level of Essential Energy's network over the previous regulatory period.

Table 5: STPIS targets 2024/25 to 2028/29

FEEDER CATEGORY	UNPLANNED SAIDI (MINUTES)	UNPLANNED SAIFI (INTERRUPTIONS)
Urban	71.65	0.854
Short Rural	210.34	1.719
Long Rural	497.73	2.810

Under AER STPIS reporting, distribution feeders are categorised as Urban, Short Rural, or Long Rural, based on feeder length and load density. Reliability performance standards were met for all feeder categories in 2024/25 except Urban and Short Rural SAIDI. Essential Energy uses this data to make efficient investment decisions for the distribution and sub-transmission networks.

According to the normalised index that covers the average number of interruptions (SAIFI) and the average time customers are without electricity (SAIDI) during the year, Essential Energy's network reliability in the reporting period decreased compared to the previous period.

Customers were without electricity for an average of 231 minutes in 2024/25 (SAIDI), compared to a figure of 206 minutes in 2023/24. The average frequency of interruptions per customer (SAIFI) was 1.61 in 2024/25, compared to a figure of 1.52 in 2023/24. The 2024/25 year was affected by a large number of major event days, 17 in total, due to an extraordinary amount of storms, floods and high wind events across the state.

3. IDENTIFIED SYSTEM LIMITATIONS

A major part of the planning process involves performing network analysis using the latest demand forecast to establish network performance under different loading and network configurations that relate to the planning criteria outlined in Essential Energy's licence conditions and internal guidelines.

The process identifies whether the network performance obligations are satisfied within the forward planning period or if corrective action is required to address a network limitation. It should be noted that limitations identified in this report have been assessed under the network conditions and licence requirements pertaining at the time of assembly and are subject to review in the event of any significant change to either. Essential Energy defines the normal cyclic ratings for zone substation transformers as 110 per cent of nameplate rating in summer and 120 per cent of nameplate rating in winter.

Only primary distribution feeder limitations where network proposals have been developed are included in this section. A distribution feeder strategic review is underway to provide more comprehensive advice in subsequent reports.

The NER requires DNSPs to investigate non-network options by utilising a thorough consultation process to facilitate input into the planning of major network upgrades. This provides opportunity for interested parties and the community to submit options and ideas allowing for the development of cost-effective demand management and other system support options.

The NER calls for a 'screening test' to be performed for all capital investments above $6M to determine if a non-network option is credible and should be investigated further. If a non-network option is deemed to be feasible, Essential Energy will conduct a detailed investigation to determine the objective and targets for a non-network option to be successful and publish this information in a Non-Network Options Report. Alternatively, a notice must be published if it is determined on reasonable grounds there are no feasible non-network options to address the investment.

The AER published a distribution system limitation template in June 2017 to enable the delivery of useable and consistent information to non-network service providers for addressing identified network needs. The template is designed to improve the quality of the information provided and enable rapid evaluation of alternative solutions. All investments provided within this template have not yet been assessed for internal or external non-network solutions.

This section outlines the identified network limitations and provides an indication of the potential network solutions against which the credible non-network alternatives will be assessed.

The detailed list of identified limitations, asset ratings and whole feeder historical load traces are published in separate files to this report. These supplementary files are available for download on the Essential Energy website https://www.essentialenergy.com.au/our-network/network-pricing-and-regulatory-reporting/regulatory-reports-and-network-information.

3.1 Sub-transmission Feeder Limitations

Table 6: Identified Sub-transmission Feeder Limitations

SUPPLY AREA	FEEDER NUMBER AND NAME	SYSTEM LIMITATION			POTENTIAL LOAD TRANSFER (MW)	LOAD REDUCTION REQUIRED FOR 1 YEAR DEFERRAL (MW)	IMPACT ON TRANSMISSION-DISTRIBUTION CONNECTION POINT	POTENTIAL CREDIBLE SOLUTIONS
		DETAILS	DRIVER	TIMING				

Central Griffith	79W Goolgowi	Voltage and thermal limitations under contingent conditions	Capacity/ Growth	Jun-28	0	2	Nil	1. Install 2nd 33kV line from Tharbogang to Tabbita Lane 2. Demand Management Alternative

3.2 Sub-transmission and Zone Substation Limitations

Table 7: Identified Sub-transmission and Zone Substation Limitations

SUPPLY AREA	SUBSTATION NAME	SYSTEM LIMITATION			POTENTIAL LOAD TRANSFER (MW)	LOAD REDUCTION REQUIRED FOR 1 YEAR DEFERRAL (MW)	IMPACT ON TRANSMISSION-DISTRIBUTION CONNECTION POINT	POTENTIAL CREDIBLE SOLUTIONS
		DETAILS	DRIVER	TIMING				
Coastal Lismore	Suffolk Park	Single transformer supply with high forecast growth	Reliability	Jun-28	5	9	Nil	Installation of second transformer
Northern Tablelands Moree	Moree	Special Activation Precinct	Growth	Jun-27	5	3	Minor	Installation of third transformer
Northern Tablelands Tamworth	Goddard Lane	Industrial Precinct	Growth	Jun-27	6	4	Minor	Installation of third transformer
Riverina Slopes Wagga North	Bomen	Special Activation Precinct	Growth	Jun-27	6	12	Minor	Installation of third transformer

3.3 Primary Distribution Feeder Limitations

Table 8: Summary of Identified Distribution Feeder Limitations

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Border Rivers Inverell	Bingara	BGA2K13 Horton Valley	Reliability	Installation of a 30MWh Stand Alone Power System replacing 22kV HV network in the vicinity of Narrabri Rd Valley Heights Bingara	$285,759	Jun-27	0 MVA	2026 - 2.1 MVA; 2027 - 2.1 MVA; 2028 - 2.1 MVA; 2029 - 2.1 MVA; 2030 - 2.1 MVA
Border Rivers Inverell	Borthwick St	BTS8B11 Inverell West	Reliability	Installation of a high voltage underground interconnector between pad sub 82015809 and pad sub 82-983188	$383,460	Jun-27	0 MVA	2026 - 4.36 MVA; 2027 - 4.36 MVA; 2028 - 4.36 MVA; 2029 - 4.36 MVA; 2030 - 4.36 MVA
Border Rivers Casino	Casino 66/11kV	CSO3B3 Leeville	Voltage	Casino Summerland Way 7.2km HV reconductor due to Voltage Constraint	$452,738	Jun-27	0 MVA	2026 - 1.34 MVA; 2027 - 1.34 MVA; 2028 - 1.34 MVA; 2029 - 1.34 MVA; 2030 - 1.34 MVA
Border Rivers Waggamba	Goondiwindi 22kV	GDI8B6 Goondiwindi Town Sth	Asset Condition	Replacement of existing Chamber Sub with new padmount sub in the vicinity of Sub 82-7631, Goondiwindi Hospital, Bowen Street, Goondiwindi	$329,395	Jun-26	0 MVA	2026 - 5.02 MVA; 2027 - 5.02 MVA; 2028 - 5.02 MVA; 2029 - 5.02 MVA; 2030 - 5.02 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Border Rivers Moree	Moree	MRE8B4 Western Rural	Asset Condition	Replace two failed 22kV 1.5MVA Pad-mounted Substations in the vicinity of Brighann Gin Moree NSW	$330,463	Jun-27	0 MVA	2026 - 2.43 MVA; 2027 - 2.43 MVA; 2028 - 2.43 MVA; 2029 - 2.43 MVA; 2030 - 2.43 MVA
Border Rivers Inverell	Texas 66/33kV	TXS3X06 Yelarbon	Asset Condition	Texas 82-R4753 4.8km HV Reconductor	$319,542	Jun-27	0 MVA	2026 - 5.08 MVA; 2027 - 5.08 MVA; 2028 - 5.08 MVA; 2029 - 5.08 MVA; 2030 - 5.08 MVA
Border Rivers Inverell	Texas 66/33kV	TXS3X06 Yelarbon	Asset Condition	Texas Holdflat Rd defect rectification of 9.8km HV Conductor	$628,083	Jun-26	0 MVA	2026 - 5.08 MVA; 2027 - 5.08 MVA; 2028 - 5.08 MVA; 2029 - 5.08 MVA; 2030 - 5.08 MVA
Border Rivers Moree	Wathagar	WTR8B2 Poison Gate	Asset Condition	Replacement of 8km of high impedance steel conductor to reduce fault levels from pole 27020834 to pole 270200962	$404,771	Jun-27	0 MVA	2026 - 1.97 MVA; 2027 - 1.97 MVA; 2028 - 1.97 MVA; 2029 - 1.97 MVA; 2030 - 1.97 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Central Griffith	Griffith	GFH3B6 Illilliwa	Asset Condition	Griffith Illilliwa Curtin Cedar McNabb St 96-2537 replace 1000m of backyard LV	$348,120	Jun-27	0 MVA	2026 - 3.66 MVA; 2027 - 3.66 MVA; 2028 - 3.66 MVA; 2029 - 3.66 MVA; 2030 - 3.66 MVA
Central Darlington Point	Hay 132kV	HAT42 Hay 132 - Carrathool	Capacity	Upgrade undersized HV voltage regulator 98-V10253 in the vicinity of Nullabor Murrumbidgee River Rd Hay	$419,649	Jun-28	2.5 MVA	2026 - 5.8 MVA; 2027 - 5.8 MVA; 2028 - 5.8 MVA; 2029 - 5.8 MVA; 2030 - 5.8 MVA
Central Darlington Point	Hillston	HIL1401 Upper Lachlan	Safety	Hillston Mt Boothagandra line relocation	$427,957	Jun-26	0 MVA	2026 - 3.78 MVA; 2027 - 3.78 MVA; 2028 - 3.78 MVA; 2029 - 3.78 MVA; 2030 - 3.78 MVA
Central Parkes	Peak Hill	PKH32 Peak Hill	Reliability	Peak Hill Install 11kV Gas Switches on the PKH32 Fdr	$254,540	Jun-27	0 MVA	2026 - 2.78 MVA; 2027 - 2.78 MVA; 2028 - 2.78 MVA; 2029 - 2.78 MVA; 2030 - 2.78 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Central Griffith	Tharbogang	THA2223 West End	Safety	Griffith Griffin Ave Altin 96-4876 encroachment	$306,549	Jun-27	0 MVA	2026 - 3.98 MVA; 2027 - 3.98 MVA; 2028 - 3.98 MVA; 2029 - 3.98 MVA; 2030 - 3.98 MVA
Central Parkes	Trundle	TDL8B2 Tullamore/Tottenham	Voltage	Trundle ZS TDL8B2 Tullamore/Tottenham Voltage Regulation	$386,305	Jun-26	0 MVA	2026 - 2.97 MVA; 2027 - 2.97 MVA; 2028 - 2.97 MVA; 2029 - 2.97 MVA; 2030 - 2.97 MVA
Central Yanco	Yanco 33/11kV	YAN2319 Euroley Rd	Asset Condition	Yanco Euroley 3.8km conductor upgrade	$290,624	Jun-28	0.53 MVA	2026 - 1.75 MVA; 2027 - 1.75 MVA; 2028 - 1.75 MVA; 2029 - 1.75 MVA; 2030 - 1.75 MVA
Central Tablelands Bathurst	Blayney	BNY3B4 Millthorpe	Capacity	Upgrade 3.3kms of 7/4.50AAC conductor that is thermally constrained	$264,857	Jun-27	0.38 MVA	2026 - 1.14 MVA; 2027 - 1.14 MVA; 2028 - 1.14 MVA; 2029 - 1.14 MVA; 2030 - 1.14 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Central Tablelands Bathurst	Blayney	BNY3B4 Millthorpe	Capacity	Blayney HV conductor constraints Browns Creek Tallwood	$328,800	Jun-27	0.38 MVA	2026 - 1.14 MVA; 2027 - 1.14 MVA; 2028 - 1.14 MVA; 2029 - 1.14 MVA; 2030 - 1.14 MVA
Central Tablelands Cowra	Canowindra	CWD13 Cargo	Voltage	Canowindra Eulimore Rd/Waterhole Creek Rd HV Reconductor due to voltage constraints	$692,974	Jun-27	0.5 MVA	2026 - 0.9 MVA; 2027 - 0.9 MVA; 2028 - 0.9 MVA; 2029 - 0.9 MVA; 2030 - 0.9 MVA
Central Tablelands Beryl	Dunedoo	DNO132 Dunedoo No.1	Asset Condition	Dunedoo Tucklan St HV Conductor EOL	$269,490	Jun-26	0.8 MVA	2026 - 4 MVA; 2027 - 4 MVA; 2028 - 4 MVA; 2029 - 4 MVA; 2030 - 4 MVA
Central Tablelands Bathurst	Mandurama	MUA5006 West	Asset Condition	Replace 2.26kms of 7/0.064HDBC and 690 metres of 6/1/0.093ACSR high voltage conductor through Carcoar Village	$315,182	Jun-27	0 MVA	2026 - 1.22 MVA; 2027 - 1.22 MVA; 2028 - 1.22 MVA; 2029 - 1.22 MVA; 2030 - 1.22 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Central Tablelands Orange	Orange South	ORS3B5 Lords Place	Safety	Replace substation 10-9I324 Orange Field Service Centre Lords Place	$272,888	Jun-26	0.3 MVA	2026 - 3.59 MVA; 2027 - 3.59 MVA; 2028 - 3.59 MVA; 2029 - 3.59 MVA; 2030 - 3.59 MVA
Central Tablelands Orange	Orange South	ORS3B3 Email (Electrolux)	Reliability	Install 4 way switching station to allow the ORS3B3 feeder to be able to support load transfer from either 3B5 or 3B8 feeders	$294,727	Jun-27	0 MVA	2026 - 6.38 MVA; 2027 - 6.38 MVA; 2028 - 6.38 MVA; 2029 - 6.38 MVA; 2030 - 6.38 MVA
Central Tablelands Orange	Orange South	ORS3B7 Anson St Sth	Asset Condition	Orange cable replacements Orange South Zone Feeders	$925,157	Jun-26	8.5 MVA	2026 - 2.23 MVA; 2027 - 2.23 MVA; 2028 - 2.23 MVA; 2029 - 2.23 MVA; 2030 - 2.23 MVA
Central Tablelands Bathurst	Raglan	RAG3B5 OConnell	Reliability	Upgrade 5.1kms of single phase steel conductor to 3 phase 7/4.50AAAC to address supply and voltage constraints	$317,583	Jun-27	0.4 MVA	2026 - 1.31 MVA; 2027 - 1.31 MVA; 2028 - 1.31 MVA; 2029 - 1.31 MVA; 2030 - 1.31 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Central Tablelands Bathurst	Raglan	RAG3B5 OConnell	Reliability	Bathurst SAPS substation 95-926 Brewongle	$405,624	Jun-27	0 MVA	2026 - 1.31 MVA; 2027 - 1.31 MVA; 2028 - 1.31 MVA; 2029 - 1.31 MVA; 2030 - 1.31 MVA
Central Tablelands Bathurst	Raglan	RAG3B6 Limekilns	Reliability	Upgrade 7kms HV conductor on the RAG3B6 Limekilns Feeder to allow the backfeed supply to Hill End Village	$516,975	Jun-27	0 MVA	2026 - 1.19 MVA; 2027 - 1.19 MVA; 2028 - 1.19 MVA; 2029 - 1.19 MVA; 2030 - 1.19 MVA
Central Tablelands Bathurst	Russell Street	BTH92 Lagoon/Trunkey	Capacity	Install a 50 amp closed delta regulator at Browns Paddock on the BTH3B8 Lagoon Trunkey Feeder to address voltage constraints	$261,261	Jun-27	0.1 MVA	2026 - 1.06 MVA; 2027 - 1.06 MVA; 2028 - 1.06 MVA; 2029 - 1.06 MVA; 2030 - 1.06 MVA
Central Tablelands Bathurst	Russell Street	BTH82 Lloyds Rd	Capacity	Bathurst supply constraints BTH3B7 Lloyds Rd Feeder	$343,987	Jun-26	2.4 MVA	2026 - 1.21 MVA; 2027 - 1.21 MVA; 2028 - 1.21 MVA; 2029 - 1.21 MVA; 2030 - 1.21 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Central Tablelands Bathurst	Russell Street	BTH72 City Central	Asset Condition	Bathurst replace 350 metres underground faulty cable city centre	$305,454	Jun-26	1.88 MVA	2026 - 5.33 MVA; 2027 - 5.33 MVA; 2028 - 5.33 MVA; 2029 - 5.33 MVA; 2030 - 5.33 MVA
Central Tablelands Bathurst	Russell Street	BTH92 Lagoon/ Trunkey	Reliability	Perthville Backup supply constraints	$623,170	Jun-27	1.23 MVA	2026 - 1.06 MVA; 2027 - 1.06 MVA; 2028 - 1.06 MVA; 2029 - 1.06 MVA; 2030 - 1.06 MVA
Central Tablelands Bathurst	Stewart	SWT12 Stewarts Mt	Voltage	Upgrade 5.6kms of 6/1/0.118ACSR to 7/4.50AAAC along Turondale Road to address voltage constraints	$385,869	Jun-27	0.3 MVA	2026 - 0.97 MVA; 2027 - 0.97 MVA; 2028 - 0.97 MVA; 2029 - 0.97 MVA; 2030 - 0.97 MVA
Central Tablelands Bathurst	Stewart	SWT42 Simplot	Capacity	Stewart load constraints Corporation Ave Bathurst	$508,683	Jun-26	2 MVA	2026 - 3.22 MVA; 2027 - 3.22 MVA; 2028 - 3.22 MVA; 2029 - 3.22 MVA; 2030 - 3.22 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Central Tablelands Wellington	Wellington 11kV	WGN72 Yeoval	Voltage	Wellington, Rural Conductor Upgrade beyond 30-R12412	$402,793	Jun-27	0.03 MVA	2026 - 0.87 MVA; 2027 - 0.87 MVA; 2028 - 0.87 MVA; 2029 - 0.87 MVA; 2030 - 0.87 MVA
Central Tablelands Wellington	Wellington 11kV	WGN72 Yeoval	Capacity	Wellington, Upgrade conductor beyond 30-R12394, Protection constraints	$618,067	Jun-27	0.02 MVA	2026 - 0.87 MVA; 2027 - 0.87 MVA; 2028 - 0.87 MVA; 2029 - 0.87 MVA; 2030 - 0.87 MVA
Coastal Lismore	Alstonville	AVE3B2 Alstonville 2	Asset Condition	Replace padsub 41-2765 and replace HV cable on existing route-340m	$330,649	Jun-27	0 MVA	2026 - 3.41 MVA; 2027 - 3.41 MVA; 2028 - 3.41 MVA; 2029 - 3.41 MVA; 2030 - 3.41 MVA
Coastal Lismore	Ewingsdale	EWE3B1 Brunswick No.1	Asset Condition	Brunswick Heads LV conductor 3.0km EOL	$447,683	Jun-27	0 MVA	2026 - 3.49 MVA; 2027 - 3.49 MVA; 2028 - 3.49 MVA; 2029 - 3.49 MVA; 2030 - 3.49 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Coastal Grafton	Grafton South	SGN3B1 Armidale Rd	Reliability	Create 11kV tie to allow ring supply to Halfway Creek	$479,057	Jun-26	0 MVA	2026 - 1.43 MVA; 2027 - 1.43 MVA; 2028 - 1.43 MVA; 2029 - 1.43 MVA; 2030 - 1.43 MVA
Coastal Grafton	Grafton South	SGN3B1 Armidale Rd	Reliability	11kV Feeder backup Pacific Highway, Halfway Creek	$722,225	Jun-27	0 MVA	2026 - 1.43 MVA; 2027 - 1.43 MVA; 2028 - 1.43 MVA; 2029 - 1.43 MVA; 2030 - 1.43 MVA
Coastal Grafton	Maclean 66/11kV	MLN3B4 Townsend	Capacity	New 315kVA padmount substation at Maclean Depot	$283,218	Jun-27	0.5 MVA	2026 - 2.27 MVA; 2027 - 2.27 MVA; 2028 - 2.27 MVA; 2029 - 2.27 MVA; 2030 - 2.27 MVA
Coastal Grafton	Maclean 66/11kV	MLN3B5 Woodford Dale-Leigh	Safety	Replace pole 74700 with new standard construction	$291,304	Jun-27	0 MVA	2026 - 2 MVA; 2027 - 2 MVA; 2028 - 2 MVA; 2029 - 2 MVA; 2030 - 2 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Coastal Lismore	Mullumbimby	MUL3B3 Mullumbimby West	Asset Condition	Mullumbimby East LV conductor 2.1km EOL	$311,824	Jun-28	0 MVA	2026 - 2.81 MVA; 2027 - 2.81 MVA; 2028 - 2.81 MVA; 2029 - 2.81 MVA; 2030 - 2.81 MVA
Coastal Lismore	Mullumbimby	MUL3B3 Mullumbimby West	Asset Condition	Mullumbimby West LV conductor 3.4km EOL	$461,384	Jun-28	0 MVA	2026 - 2.81 MVA; 2027 - 2.81 MVA; 2028 - 2.81 MVA; 2029 - 2.81 MVA; 2030 - 2.81 MVA
Coastal Terranora	Murwillumbah	MWN3B2 Norco	Capacity	Create 11kV tie to provide ring for Industrial precinct	$423,152	Jun-26	2.54 MVA	2026 - 2.06 MVA; 2027 - 2.06 MVA; 2028 - 2.06 MVA; 2029 - 2.06 MVA; 2030 - 2.06 MVA
Coastal Lismore	Woodburn	WBN3B4 Broadwater	Voltage	Augmet to dual river crossing and reconduct 9.8km	$1,887,199	Jun-26	0 MVA	2026 - 2.37 MVA; 2027 - 2.37 MVA; 2028 - 2.37 MVA; 2029 - 2.37 MVA; 2030 - 2.37 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Coastal Lismore	Woodburn	WBN3B3 Coraki	Asset Condition	East Coraki Oakland Rd Conductor 5.7km EOL	$329,744	Jun-27	0 MVA	2026 - 1.87 MVA; 2027 - 1.87 MVA; 2028 - 1.87 MVA; 2029 - 1.87 MVA; 2030 - 1.87 MVA
Coastal Grafton	Yamba	YAM3B4 Yamba West	Asset Condition	Replace substation 51-796	$298,061	Jun-26	0.32 MVA	2026 - 3.4 MVA; 2027 - 3.4 MVA; 2028 - 3.4 MVA; 2029 - 3.4 MVA; 2030 - 3.4 MVA
Mid North Coast Taree	Bohnock	BNK24787 Old Bar No.2	Capacity	Replacement of undersized 11kV cable	$368,642	Jun-27	0 MVA	2026 - 2.99 MVA; 2027 - 2.99 MVA; 2028 - 2.99 MVA; 2029 - 2.99 MVA; 2030 - 2.99 MVA
Mid North Coast Stroud	Bulahdelah	BLH3B3 Bulahdelah Nth/Markwell/Newells Ck	Safety	Replacement of ground mounted substation	$385,917	Jun-27	0 MVA	2026 - 1.8 MVA; 2027 - 1.8 MVA; 2028 - 1.8 MVA; 2029 - 1.8 MVA; 2030 - 1.8 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Mid North Coast Taree	Harrington	HGN3B1 Crowdy Head	Asset Condition	Replacement of consac cable	$359,694	Jun-27	0 MVA	2026 - 3.08 MVA; 2027 - 3.08 MVA; 2028 - 3.08 MVA; 2029 - 3.08 MVA; 2030 - 3.08 MVA
Mid North Coast Port Macquarie	Lake Cathie	LKC7781 Cathie Sth	Reliability	Wallum Drv Seascape Lake Cathie thermal overload & reliability	$220,000	Jun-29	0 MVA	2026 - 2.78 MVA; 2027 - 2.78 MVA; 2028 - 2.78 MVA; 2029 - 2.78 MVA; 2030 - 2.78 MVA
Mid North Coast Kempsey	Munga	MGA3B1 Turners Flat	Reliability	PPF Deep Ck Turners Ck Rd from near 2-R10113 to near sub 2-50477 conductor EOL	$257,000	Jun-28	0 MVA	2026 - 1.11 MVA; 2027 - 1.11 MVA; 2028 - 1.11 MVA; 2029 - 1.11 MVA; 2030 - 1.11 MVA
Mid North Coast Coffs Harbour	Nana Glen	NGN3B2 Coramba	Reliability	Establish 11k tie - Coramba East Bank Rd	$306,542	Jun-27	0 MVA	2026 - 1.71 MVA; 2027 - 1.71 MVA; 2028 - 1.71 MVA; 2029 - 1.71 MVA; 2030 - 1.71 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Mid North Coast Port Macquarie	Owen St	OPM3B1 Granite St	Asset Condition	Replace HV cable 400m McLaren Drv near sub 2-41451 Port Macquarie	$275,470	Jun-26	0 MVA	2026 - 4.02 MVA; 2027 - 4.02 MVA; 2028 - 4.02 MVA; 2029 - 4.02 MVA; 2030 - 4.02 MVA
Mid North Coast Kempsey	Prince St	PSK3B4 Industrial	Asset Condition	Kempsey South St sub 2-51085 padsub HV switchgear and cable end of life	$112,000	Jun-26	0 MVA	2026 - 0.5 MVA; 2027 - 0.5 MVA; 2028 - 0.5 MVA; 2029 - 0.5 MVA; 2030 - 0.5 MVA
Mid North Coast Hawks Nest	Tea Gardens	TEA3B4 Tea Gardens	Reliability	11kV underground tie	$885,660	Jun-27	0 MVA	2026 - 3.94 MVA; 2027 - 3.94 MVA; 2028 - 3.94 MVA; 2029 - 3.94 MVA; 2030 - 3.94 MVA
Mid North Coast Hawks Nest	Tea Gardens	TEA3B3 Mineral Deposits	Reliability	Underbore of river to install conduits for future cable replacement	$1,150,000	Jun-27	0 MVA	2026 - 2.82 MVA; 2027 - 2.82 MVA; 2028 - 2.82 MVA; 2029 - 2.82 MVA; 2030 - 2.82 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Mid North Coast Taree	Wingham	WGM3B5 Hillside	Capacity	HV extension to new substation for Community precinct	$347,555	Jun-26	0 MVA	2026 - 1.03 MVA; 2027 - 1.03 MVA; 2028 - 1.03 MVA; 2029 - 1.03 MVA; 2030 - 1.03 MVA
Mid North Coast Coffs Harbour	Woolgoolga	WGA3B6 Corindi	Reliability	Remove pole from sand dunes, and re-route as UG cable	$289,060	Jun-26	0 MVA	2026 - 2.98 MVA; 2027 - 2.98 MVA; 2028 - 2.98 MVA; 2029 - 2.98 MVA; 2030 - 2.98 MVA
Murray Albury	Corowa	CRA32 Corowa Town No.2	Asset Condition	Corowa, Honour Ave, veranda main & direct buried underground upgrade between sub 63-50260 & CE243198	$282,813	Jun-28	0 MVA	2026 - 5.19 MVA; 2027 - 5.19 MVA; 2028 - 5.19 MVA; 2029 - 5.19 MVA; 2030 - 5.19 MVA
Murray Albury	Corowa	CRA42 Corurgan	Asset Condition	Replace substation	$440,450	Jun-27	0 MVA	2026 - 2.12 MVA; 2027 - 2.12 MVA; 2028 - 2.12 MVA; 2029 - 2.12 MVA; 2030 - 2.12 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Murray Finley	Finley Town	FIN52 Tocumwal	Capacity	Two new 300A 22kV closed delta regulators	$630,398	Jun-27	0 MVA	2026 - 2.35 MVA; 2027 - 2.35 MVA; 2028 - 2.35 MVA; 2029 - 2.35 MVA; 2030 - 2.35 MVA
Murray Morven	Holbrook	HOL1890 Wantagong/Woomargama	Asset Condition	Install 2 x SAPS	$493,252	Jun-26	0 MVA	2026 - 1.79 MVA; 2027 - 1.79 MVA; 2028 - 1.79 MVA; 2029 - 1.79 MVA; 2030 - 1.79 MVA
Murray Deniliquin	Moama	MOA8B2 Moama West	Asset Condition	Replace underground LV due to extreme apidic acid build up in the vicinity of Lawson Dr Moama	$689,611	Jun-28	0.1 MVA	2026 - 6.15 MVA; 2027 - 6.15 MVA; 2028 - 6.15 MVA; 2029 - 6.15 MVA; 2030 - 6.15 MVA
Murray Broken Hill	Mt Gipps 33kV	MTG4B1 Tibooburra Backbone Line	Resilience	Broken Hill - Packsaddle Roadhouse Resilience and EV Charger Connection	$310,611	Jun-26	0.3 MVA	2026 - 7.3 MVA; 2027 - 7.3 MVA; 2028 - 7.3 MVA; 2029 - 7.3 MVA; 2030 - 7.3 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Murray Broken Hill	Mt Gipps 33kV	MTG4B1 Tibooburra Backbone Line	Reliability	Install SAPS to allow the removal of 37km of overhead SWER	$334,991	Jun-27	0 MVA	2026 - 7.3 MVA; 2027 - 7.3 MVA; 2028 - 7.3 MVA; 2029 - 7.3 MVA; 2030 - 7.3 MVA
Murray Albury	Mulwala	MWA8B4 North St and Rural	Asset Condition	Replace LV underground cables	$279,708	Jun-27	0 MVA	2026 - 2.08 MVA; 2027 - 2.08 MVA; 2028 - 2.08 MVA; 2029 - 2.08 MVA; 2030 - 2.08 MVA
Murray Broken Hill	TransGrid 220/22kV Total Broken Hill 22kV Supply	BHL42 Railwaytown	Asset Condition	Broken Hill, Refurbishment sub 6-16271 Sturt Park Sulphide St	$296,983	Jun-27	0.5 MVA	2026 - 6.71 MVA; 2027 - 6.71 MVA; 2028 - 6.71 MVA; 2029 - 6.71 MVA; 2030 - 6.71 MVA
Namoi Tamworth	Attunga	ATA3B1 Attunga	Asset Condition	Tamworth, Garthowen Rd, 18-971752, HV conductor EOL	$389,921	Jun-27	0.3 MVA	2026 - 1.2 MVA; 2027 - 1.2 MVA; 2028 - 1.2 MVA; 2029 - 1.2 MVA; 2030 - 1.2 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Namoi Gunnedah	Boggabri	BBI1101 M11 Ghoolendaadi	Asset Condition	Boggabri Cotton Gin 75-110051 TX EOL	$273,649	Jun-25	3 MVA	2026 - 1.19 MVA; 2027 - 1.19 MVA; 2028 - 1.19 MVA; 2029 - 1.19 MVA; 2030 - 1.19 MVA
Namoi Beryl	Coonabarabran	CBB8B1 Tambar Springs	Asset Condition	Purlewaugh Coonabarabran Rd HV Conductor End of Life	$278,391	Jun-27	0 MVA	2026 - 1.94 MVA; 2027 - 1.94 MVA; 2028 - 1.94 MVA; 2029 - 1.94 MVA; 2030 - 1.94 MVA
Namoi Armidale	Galloway St	GLS3B2 Rockvale	Asset Condition	Replace Padmount sub and HV/LV UG cables	$338,295	Jun-27	0 MVA	2026 - 1.07 MVA; 2027 - 1.07 MVA; 2028 - 1.07 MVA; 2029 - 1.07 MVA; 2030 - 1.07 MVA
Namoi Armidale	Galloway St	GLS3B7 City Central	Asset Condition	Replace defective substation and associated HV/LV UG cables	$574,537	Jun-26	0 MVA	2026 - 3.67 MVA; 2027 - 3.67 MVA; 2028 - 3.67 MVA; 2029 - 3.67 MVA; 2030 - 3.67 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Namoi Armidale	Galloway St	GLS3B1 Gara	Asset Condition	Reconductor 10.8km of copper HV. PPF	$655,138	Jun-27	0 MVA	2026 - 1.17 MVA; 2027 - 1.17 MVA; 2028 - 1.17 MVA; 2029 - 1.17 MVA; 2030 - 1.17 MVA
Namoi Armidale	Hillgrove	HGE3B1 Grafton Rd	Reliability	Reconductor 9.2km of HV with ACSR	$381,914	Jun-27	0 MVA	2026 - 0.87 MVA; 2027 - 0.87 MVA; 2028 - 0.87 MVA; 2029 - 0.87 MVA; 2030 - 0.87 MVA
Namoi Armidale	Hillgrove	HGE3B1 Grafton Rd	Reliability	Reconductor 10.2km of Wagtail HV conductor	$529,086	Jun-28	0 MVA	2026 - 0.87 MVA; 2027 - 0.87 MVA; 2028 - 0.87 MVA; 2029 - 0.87 MVA; 2030 - 0.87 MVA
Namoi Armidale	Madgwick Dr	UNI3B2 Tilbuster/ Puddledock	Asset Condition	Reconductor 5.3km of HV conductor	$367,385	Jun-27	0 MVA	2026 - 1.05 MVA; 2027 - 1.05 MVA; 2028 - 1.05 MVA; 2029 - 1.05 MVA; 2030 - 1.05 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Namoi Tamworth	Nundle	NDL3B2 Woolomin	Asset Condition	Woolomin Nundle Rd 232776 HV Conductor EOL	$470,308	Jun-27	0 MVA	2026 - 2.1 MVA; 2027 - 2.1 MVA; 2028 - 2.1 MVA; 2029 - 2.1 MVA; 2030 - 2.1 MVA
Namoi Tamworth	Tamworth East	ETH3B14 King George Ave	Asset Condition	Nemingha Cross Park Rd 1445290 HV Conductor End of Life	$269,675	Jun-27	2.3 MVA	2026 - 2.36 MVA; 2027 - 2.36 MVA; 2028 - 2.36 MVA; 2029 - 2.36 MVA; 2030 - 2.36 MVA
Namoi Tamworth	Tamworth East	ETH3B11 Coles/White	Asset Condition	Tamworth White Street transformer 18-141 replacement due to defect	$336,544	Jun-27	0.32 MVA	2026 - 0.3 MVA; 2027 - 0.3 MVA; 2028 - 0.3 MVA; 2029 - 0.3 MVA; 2030 - 0.3 MVA
Namoi Tamworth	Tamworth East	ETH3B7 TCC/Calala	Capacity	Address capacity and reliability risks identified within the Calala network	$496,722	Jun-26	4 MVA	2026 - 3.54 MVA; 2027 - 3.54 MVA; 2028 - 3.54 MVA; 2029 - 3.54 MVA; 2030 - 3.54 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
Namoi Tamworth	Tamworth South	STH3B9 Winton	Asset Condition	Tamworth, between new and old Winton Rds, 18-4746, HV Conductor EOL	$290,803	Jun-27	0.3 MVA	2026 - 1.2 MVA; 2027 - 1.2 MVA; 2028 - 1.2 MVA; 2029 - 1.2 MVA; 2030 - 1.2 MVA
Namoi Armidale	Walcha South 22/11kV	WLS3B1 Walcha East	Asset Condition	Reconductor 2.6km of Copper HV conductor	$275,566	Jun-26	0 MVA	2026 - 2.2 MVA; 2027 - 2.2 MVA; 2028 - 2.2 MVA; 2029 - 2.2 MVA; 2030 - 2.2 MVA
Namoi Armidale	Walcha South 66/22kV	WLS8B5 Uralla/Walcha Rd/Wollun	Asset Condition	Reconductor 10km of 7/0.64Cu HV conductor	$763,139	Jun-27	0 MVA	2026 - 4.84 MVA; 2027 - 4.84 MVA; 2028 - 4.84 MVA; 2029 - 4.84 MVA; 2030 - 4.84 MVA
Namoi Tamworth	Werris Creek	WCK516 Dewhurst/Gordo n	Asset Condition	Werris Creek Dewhurst Street 213917 HV Conductor EOL	$304,361	Jun-26	1.7 MVA	2026 - 2.5 MVA; 2027 - 2.5 MVA; 2028 - 2.5 MVA; 2029 - 2.5 MVA; 2030 - 2.5 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
North Western Nyngan	Bourke 33kV	BKE4B2 M82 Wanaaring	Reliability	Bourke Wanaaring BKE4B2 M82 Multiple Sites PPF	$285,021	Jun-27	1.68 MVA	2026 - 4.31 MVA; 2027 - 4.31 MVA; 2028 - 4.31 MVA; 2029 - 4.31 MVA; 2030 - 4.31 MVA
North Western Dubbo	Dubbo South	DBS3B8 Margaret Cres	Capacity	Replace existing 1000kVA Pad Sub 30-4559 with a 1500 kVA Pad Sub	$265,581	Jun-26	0 MVA	2026 - 3.52 MVA; 2027 - 3.52 MVA; 2028 - 3.52 MVA; 2029 - 3.52 MVA; 2030 - 3.52 MVA
North Western Dubbo	Gilgandra	GID22 Rural Nth/Sth/West	Asset Condition	Replace 2.9 km of 7/104 HDBC 11 kV conductor with 7/450 AAAC in the vicinity of South Gilgandra	$333,364	Jun-27	0 MVA	2026 - 0.84 MVA; 2027 - 0.84 MVA; 2028 - 0.84 MVA; 2029 - 0.84 MVA; 2030 - 0.84 MVA
North Western Dubbo	Gilgandra	GID12 Gilgandra Town No.1	Safety	Relocate the existing Low Voltage network that supplies the CBD of the Township of Gilgandra	$779,509	Jun-27	0 MVA	2026 - 2.58 MVA; 2027 - 2.58 MVA; 2028 - 2.58 MVA; 2029 - 2.58 MVA; 2030 - 2.58 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
North Western Dubbo	Gulargambone	GGB112 Gulargambone	Asset Condition	Reconductor 7/064 HDBC between GGB112 CB through to 30-G2930 with 7/450 AAAC in vicinity of Gulargambone	$886,190	Jun-27	0 MVA	2026 - 1.32 MVA; 2027 - 1.32 MVA; 2028 - 1.32 MVA; 2029 - 1.32 MVA; 2030 - 1.32 MVA
North Western Dubbo	Narromine	NME8B3 Trangie Rural	Reliability	Replace approx. 6.6km of 3/2.00 SC/GZ 3PH 22kV conductor in the vicinity of Trangie Dandaloo Rd, Trangie NSW	$419,574	Jun-28	0 MVA	2026 - 1.46 MVA; 2027 - 1.46 MVA; 2028 - 1.46 MVA; 2029 - 1.46 MVA; 2030 - 1.46 MVA
Riverina Slopes Wagga (Copland St)	Kooringal	KOO3B1 Plumpton Rd	Power Quality	Replace eastern LV circuit with 240mm AL XLPE and replace distribution transformer	$457,910	Jun-26	0 MVA	2026 - 0.1 MVA; 2027 - 0.32 MVA; 2028 - 0.32 MVA; 2029 - 0.32 MVA; 2030 - 0.32 MVA
Riverina Slopes Wagga (Copland St)	Kooringal	KOO3B6 Lake Albert	Asset Condition	Replace steel columns and approx. 350m of LV CONSAC cable with 240mm AL XLPE supplied via sub 71-3645	$444,719	Jun-27	0 MVA	2026 - 0.2 MVA; 2027 - 0.2 MVA; 2028 - 0.2 MVA; 2029 - 0.2 MVA; 2030 - 0.2 MVA
South Eastern Steeple Flat	Bombala	BOM8B2 Nimmitabel	Asset Condition	Replace steel conductor	$509,010	Feb-26	0 MVA	2026 - 1.73 MVA; 2027 - 1.73 MVA; 2028 - 1.73 MVA; 2029 - 1.73 MVA; 2030 - 1.73 MVA

SUPPY AREA	ZONE SUBSTATION	FEEDER	PRIMARY DRIVER	PREFERRED NETWORK SOLUTION	ESTIMATED CAPTIAL COST	PROPOSED TIMING	DEMAND REDUCTION REQUIRED FOR 1 YEAR DEFERRAL	SEGMENT ASSET RATING
South Eastern Bega	Eden South	ESH3B5 Boydtown	Safety	Boydtown Nullica St Address encroachment defects	$452,840	Jun-26	0 MVA	2026 - 2.54 MVA; 2027 - 2.54 MVA; 2028 - 2.54 MVA; 2029 - 2.54 MVA; 2030 - 2.54 MVA
South Eastern Goulburn	Marulan North	MRN8B3 Marulan Town	Asset Condition	Upgrade conductor removing failing copper	$452,992	Sep-27	0 MVA	2026 - 8.39 MVA; 2027 - 8.39 MVA; 2028 - 8.39 MVA; 2029 - 8.39 MVA; 2030 - 8.39 MVA
South Eastern Moruya North	Moruya Town	MYT3B2 Kiora	Asset Condition	Moruya replace chamber substation 31-577	$406,752	Jun-26	0 MVA	2026 - 1.67 MVA; 2027 - 1.67 MVA; 2028 - 1.67 MVA; 2029 - 1.67 MVA; 2030 - 1.67 MVA
South Eastern Goulburn	Woodlawn	WOO3B2 Rural Fdr 2	Reliability	Reconductor single phase line to 3 phase to supply Tarago town via 10km shorter route than existing supply	$534,675	Sep-27	1 MVA	2026 - 1.1 MVA; 2027 - 1.1 MVA; 2028 - 1.1 MVA; 2029 - 1.1 MVA; 2030 - 1.1 MVA
South Eastern Yass	Yass	YAS6242 Yass Town Sth	Asset Condition	Yass, Barber St, replace substation 25-714 due to asset condition	$312,596	Jun-27	0 MVA	2026 - 5.44 MVA; 2027 - 5.44 MVA; 2028 - 5.44 MVA; 2029 - 5.44 MVA; 2030 - 5.44 MVA

3.4 Network Asset Retirements and De-ratings – Sub-transmission

Essential Energy has no identified retirements or deratings within the sub-transmission network.

3.5 Network Asset Retirements and De-ratings – Zone Substation

Essential Energy continue to improve their asset management strategies and policies which support the capital investment process. This includes both augmentation and replacement driven projects. For replacement driven projects the risk of asset failure is monitored, as well as its impact on reliability, safety, and the environment. The planned timing of a retirement project could change from year to year as the value assessment of cost verse risk on all augmentation and replacement projects through all asset types are evaluated and compared regularly to produce an optimised capital investment program. The estimated timings are from the most recent optimisation.

3.5.1 INDOOR SWITCHBOARD REPLACEMENT, REFURBISHMENT AND CONVERSION

Table 9: Zone Substation Indoor Switchboards (Replacement, Refurbishment and Conversion)

ASSET DESCRIPTION AND LOCATION	TIMING	REASON IDENTIFIED
Beelbangera ZS Refurbishment / Replacement	Jun-26	Economic end of life, Safety
Owen St ZS Refurbishment / Replacement	Jun-26	Economic end of life, Safety
Temora ZS Refurbishment / Replacement	Jun-26	Economic end of life, Safety
Cootamundra ZS Refurbishment / Replacement	Jun-27	Economic end of life, Safety
Forster ZS 11kV Switchboard & 66kV CB's Refurbishment / Replacement	Jun-27	Economic end of life, Safety
Cartwrights Hill 66/11kV ZS Switchboard Refurbishment / Replacement	Jun-28	Economic end of life, Safety
Laurieton ZS Refurbishment / Replacement	Jun-28	Economic end of life, Safety
Narooma ZS Refurbishment / Replacement	Jun-28	Economic end of life, Safety
Googong Dam ZS Refurbishment / Replacement	Jun-29	Economic end of life, Safety
Perisher ZS Refurbishment / Replacement	Jun-29	Economic end of life, Safety

3.5.2 POWER TRANSFORMER REPLACEMENT

Table 10: Zone Substation Power Transformer Replacement

ASSET DESCRIPTION AND LOCATION	TIMING	REASON IDENTIFIED
Goulburn 132 ZS Replace TX1	Jun-27	Economic end of life
Gulgong ZS Replace TX1	Jun-27	Economic end of life
Guyra ZS Replace TX2	Jun-27	Economic end of life
Oura ZS Replace TX4	Jun-27	Economic end of life
Cartwrights Hill ZS Replace TX1 and TX2	Jun-28	Economic end of life
Burren Junction ZS Replace TX1	Jun-28	Economic end of life
Boorowa ZS Replace TX2	Jun-28	Economic end of life

3.5.3 CIRCUIT BREAKER REPLACEMENT

Table 11: Zone Substation Circuit Breaker Replacement

ASSET DESCRIPTION AND LOCATION	TIMING	REASON IDENTIFIED
Goulburn 132 - Replace 132kV CB	Jun-26	Economic end of life
Temora 132 - Replace six 66kV CB's and CT's	Jun-26	Economic end of life
Boggabri ZS - Replace 66kV and 11kV CB's	Jun-27	Economic end of life
Wellington ZS - Replace three 66kV CB's	Jun-28	Economic end of life

3.5.4 COMBINED ASSET RETIREMENTS AND DE-RATINGS

Table 12: Combined Asset Replacements

ASSET DESCRIPTION	REGION	TIMING	REASON IDENTIFIED
Wooden Pole Staking and Replacement	All Regions	Jun-26	Asset Age, Asset Failure
Wooden Pole Staking and Replacement	All Regions	Jun-27	Asset Age, Asset Failure
Wooden Pole Staking and Replacement	All Regions	Jun-28	Asset Age, Asset Failure
Wooden Pole Staking and Replacement	All Regions	Jun-29	Asset Age, Asset Failure
Wooden Pole Staking and Replacement	All Regions	Jun-30	Asset Age, Asset Failure
Concrete/Steel/Other Pole Replacement	All Regions	Jun-26	Asset Age, Asset Failure
Concrete/Steel/Other Pole Replacement	All Regions	Jun-27	Asset Age, Asset Failure
Concrete/Steel/Other Pole Replacement	All Regions	Jun-28	Asset Age, Asset Failure
Concrete/Steel/Other Pole Replacement	All Regions	Jun-29	Asset Age, Asset Failure
Concrete/Steel/Other Pole Replacement	All Regions	Jun-30	Asset Age, Asset Failure
Pole Top Structure Replacement	All Regions	Jun-26	Asset Age, Asset Failure
Pole Top Structure Replacement	All Regions	Jun-27	Asset Age, Asset Failure
Pole Top Structure Replacement	All Regions	Jun-28	Asset Age, Asset Failure
Pole Top Structure Replacement	All Regions	Jun-29	Asset Age, Asset Failure
Pole Top Structure Replacement	All Regions	Jun-30	Asset Age, Asset Failure
Overhead Conductor Replacement	All Regions	Jun-26	Asset Age, Asset Failure
Overhead Conductor Replacement	All Regions	Jun-27	Asset Age, Asset Failure
Overhead Conductor Replacement	All Regions	Jun-28	Asset Age, Asset Failure
Overhead Conductor Replacement	All Regions	Jun-29	Asset Age, Asset Failure
Overhead Conductor Replacement	All Regions	Jun-30	Asset Age, Asset Failure
Underground Cable Replacement	All Regions	Jun-26	Asset Age, Asset Failure
Underground Cable Replacement	All Regions	Jun-27	Asset Age, Asset Failure

ASSET DESCRIPTION	REGION	TIMING	REASON IDENTIFIED
Underground Cable Replacement	All Regions	Jun-28	Asset Age, Asset Failure
Underground Cable Replacement	All Regions	Jun-29	Asset Age, Asset Failure
Underground Cable Replacement	All Regions	Jun-30	Asset Age, Asset Failure
Service Line Replacement	All Regions	Jun-26	Asset Age, Asset Failure
Service Line Replacement	All Regions	Jun-27	Asset Age, Asset Failure
Service Line Replacement	All Regions	Jun-28	Asset Age, Asset Failure
Service Line Replacement	All Regions	Jun-29	Asset Age, Asset Failure
Service Line Replacement	All Regions	Jun-30	Asset Age, Asset Failure
Pole Mounted Transformer Replacement	All Regions	Jun-26	Asset Age, Asset Failure
Pole Mounted Transformer Replacement	All Regions	Jun-27	Asset Age, Asset Failure
Pole Mounted Transformer Replacement	All Regions	Jun-28	Asset Age, Asset Failure
Pole Mounted Transformer Replacement	All Regions	Jun-29	Asset Age, Asset Failure
Pole Mounted Transformer Replacement	All Regions	Jun-30	Asset Age, Asset Failure
Kiosk/Chamber/Other Transformer Replacement	All Regions	Jun-26	Asset Age, Asset Failure
Kiosk/Chamber/Other Transformer Replacement	All Regions	Jun-27	Asset Age, Asset Failure
Kiosk/Chamber/Other Transformer Replacement	All Regions	Jun-28	Asset Age, Asset Failure
Kiosk/Chamber/Other Transformer Replacement	All Regions	Jun-29	Asset Age, Asset Failure
Kiosk/Chamber/Other Transformer Replacement	All Regions	Jun-30	Asset Age, Asset Failure
Network Switchgear Replacement	All Regions	Jun-26	Asset Age, Asset Failure
Network Switchgear Replacement	All Regions	Jun-27	Asset Age, Asset Failure
Network Switchgear Replacement	All Regions	Jun-28	Asset Age, Asset Failure
Network Switchgear Replacement	All Regions	Jun-29	Asset Age, Asset Failure
Network Switchgear Replacement	All Regions	Jun-30	Asset Age, Asset Failure
Public Lighting Replacement	All Regions	Jun-26	Asset Age, Asset Failure
Public Lighting Replacement	All Regions	Jun-27	Asset Age, Asset Failure
Public Lighting Replacement	All Regions	Jun-28	Asset Age, Asset Failure
Public Lighting Replacement	All Regions	Jun-29	Asset Age, Asset Failure
Public Lighting Replacement	All Regions	Jun-30	Asset Age, Asset Failure
SCADA, Network Control and Protection Systems Replacement	All Regions	Jun-26	Asset Age, Asset Failure
SCADA, Network Control and Protection Systems Replacement	All Regions	Jun-27	Asset Age, Asset Failure
SCADA, Network Control and Protection Systems Replacement	All Regions	Jun-28	Asset Age, Asset Failure

ASSET DESCRIPTION	REGION	TIMING	REASON IDENTIFIED
SCADA, Network Control and Protection Systems Replacement	All Regions	Jun-29	Asset Age, Asset Failure
SCADA, Network Control and Protection Systems Replacement	All Regions	Jun-30	Asset Age, Asset Failure
Streetlight Control Wire Removal	All Regions	Jun-26	Asset Age, Safety
Streetlight Control Wire Removal	All Regions	Jun-27	Asset Age, Safety
Streetlight Control Wire Removal	All Regions	Jun-28	Asset Age, Safety
Streetlight Control Wire Removal	All Regions	Jun-29	Asset Age, Safety
Streetlight Control Wire Removal	All Regions	Jun-30	Asset Age, Safety

4. NETWORK INVESTMENTS

4.1 Regulatory Test / RIT-Ds Completed or in Progress

Essential Energy has had no RiT-Ds in progress in FY25.

4.2 Potential RIT-Ds for Identified System Limitations

Table 13: Potential RiT-Ds for Identified System Limitations

PROJECT NAME	PROJECT DRIVER	ESTIMATED COST	RIT-D REQUIREMENT/COMMENCEMENT
Perisher ZS refurbishment	Refurbishment	$35M	May 2027

4.3 Urgent and Unforeseen Investments

Essential Energy has had no urgent or unforeseen investments in FY25.

5. JOINT PLANNING

Joint Planning is a requirement under Rule 5.14 of the NER, which requires Essential Energy to carry out Joint Planning with each Network Service Provider (NSP) to which its networks are connected. Consequently, Essential Energy conducts Joint Planning activities with TNSPs – Transgrid and Powerlink Queensland. At a DNSP level, it conducts such activities with Energex and Ergon Energy (of parent company Energy Queensland formed as of 1 July 2016), Ausgrid, Endeavour Energy, Evoenergy (formerly ActewAGL) and Powercor Australia.

The frequency, process and methodology of such Joint Planning depends on the timing of emerging network constraints due to growth, reliability and refurbishment needs, as well as other external drivers such as third-party connection requests to service new or augmented major loads, embedded generators and energy storage systems.

Joint Planning aims to identify the most efficient network or non-network option to address the need in a prudent manner, regardless of ownership, jurisdiction, or boundary.

In general, the process and methodology incorporate a formal Joint Planning committee between the relevant parties (Essential Energy and the NSP or in some cases multiple NSPs) which, depending upon the emerging limitation(s), severity and impact, will then meet to jointly confirm, quantify, review, recommend and resolve the matter(s).

This is undertaken using agreed technical, unit cost, fiscal, risk and sensitivity assessment assumptions and criterion to compare and evaluate the credible non-network and network alternatives in order to select, plan and deliver the most prudent investment(s) in accordance with NER requirements and objectives.

In the case of shared investments over a combined total cost threshold of $7M, regulatory consultation documentation and notifications are prepared and published jointly in accordance with the NER process requirements.

For investments below this threshold value, the appropriate investment case documentation is shared and held by the joint parties. In both instances, where necessary, a Joint Planning Report (JPR) is executed to define the high-level responsibilities of all parties in delivering, funding and owning the investment or parts thereof.

5.1 Results of Joint Planning with the TNSP Transgrid

5.1.1 SUMMARY OF THE PROCESS AND METHODOLOGY

An existing Joint Planning committee, made up of network planning staff from Essential Energy and Transgrid, met regularly (approximately every quarter) throughout the past year. A Joint Planning Charter, detailing a formally structured approach and guiding principles, sets the basis. Issues and outcomes were minuted with actions, and where necessary, issues were referred to an overseeing Joint Executive Steering Committee.

Transgrid has a Transmission Reliability Standard (enforced from 1 July 2018), and as an ongoing consequence Transgrid and Essential Energy have consulted with each other via Joint Planning, and where cost effective, are initiating works to reduce expected unserved energy supplied from Transgrid Bulk Supply Points substations.

Essential Energy and Transgrid have engaged in regular Joint Planning each quarter throughout 2025.

5.1.2 INVESTMENTS JOINTLY PLANNED

Several matters have required continued Joint Planning collaboration with Transgrid throughout 2025:

Joint Planning between Essential Energy and Transgrid regarding the apparent and emerging 132kV network constraints in the Orange, Bathurst, Parkes/Forbes, Wagga, Yass, Beryl/Wellington, Queanbeyan and Gunnedah/Narrabri areas of NSW.

This is presently ongoing due to the uncertainty of spot load developments and several small to large embedded generation proposals.

There is ongoing Joint Planning collaboration with Transgrid regarding the provision of increased supply capacity from both the Transgrid Queanbeyan and Williamsdale substations to cater for proposed new and emerging loads in the South Jerrabomberra area of the Essential Energy footprint. This has necessitated 3-way Joint Planning with Evo energy regarding several proposed large spot loads and a review of the wider strategic plan for the Transgrid 330kV and 132kV backbone network supporting this combined ACT/Queanbeyan area and surrounds.

There is further Joint Planning collaboration with Transgrid regarding the staged provision of increased supply capacity to the North West Slopes area incorporating Narrabri, Gunnedah, Inverell and Moree.

Essential Energy and Transgrid continue to be engaged in Joint Planning regarding the optimisation of voltage control settings, specifically at several Transgrid Bulk Supply Point substations to alleviate high voltage constraints in the Essential energy network due to increased embedded generation.

Joint Planning collaboration has commenced with Transgrid regarding reliable supply to the Yass area and the Wagga area as supplied from the associated Transgrid Bulk Supply Point substations.

5.1.3 ADDITIONAL INFORMATION

Additional detailed information regarding the above considerations may be obtained from the Essential Energy and Transgrid websites, and as published in the preceding and latest Transgrid Transmission Annual Planning Reports.

5.2 Results of Joint Planning with the TNSP Powerlink

5.2.1 SUMMARY OF THE PROCESS AND METHODOLOGY

For the purpose of effective network planning, Essential Energy has collaborated in regular Joint Planning with Powerlink Queensland as part of an established continual process. Necessary collaboration regarding network matters such as emerging constraints and planned developments have and are undertaken regularly, as required based on project need.

This is facilitated through face-to-face meetings or videoconferencing between Joint Planning representatives from both organisations. These interactions have formal agendas and minuted outcomes with assigned responsibilities. The Joint Planning representatives from Powerlink and Essential Energy are from the respective Joint Planning teams and may from time-to-time consist of representatives from specialist technical teams outside of network planning.

In 2025, we have had a few telephone/email discussions regarding strategic Joint Planning coordination with Powerlink and Energex (Energy Queensland) regarding capacity and resilience support to the lower Gold Coast area of Queensland and the Tweed region of NSW. It is anticipated this will continue over the next few years and may involve other market participants.

5.2.2 INVESTMENTS JOINTLY PLANNED

Nil.

5.2.3 ADDITIONAL INFORMATION

Nil.

5.3 Results of Joint Planning with the DNSP Energex

5.3.1 SUMMARY OF THE PROCESS AND METHODOLOGY

For the purpose of effective network planning, Essential Energy has collaborated in regular Joint Planning with Energex as part of an established continual process. Necessary collaboration regarding network matters such as emerging constraints and planned developments have and are undertaken regularly, as required based on project need.

This is facilitated through face-to-face meetings or videoconferencing between Joint Planning representatives from both organisations. These interactions have formal agendas and minuted outcomes with assigned responsibilities. The Joint Planning representatives from Energex and Essential Energy are from the respective Joint Planning teams and may from time-to-time consist of representatives from specialist technical teams outside of network planning.

In 2025, there has been a few telephone/email discussions with Energex regarding the timing of future capacity and resilience support to the lower Gold Coast area of Queensland and the Tweed region of NSW as part of strategic 3-way Joint Planning with Powerlink. This is ongoing and is subject to proposed future augmentation in the Essential Energy Tweed Region.

5.3.2 INVESTMENTS JOINTLY PLANNED

Nil.

5.3.3 ADDITIONAL INFORMATION

Nil.

5.4 Results of Joint Planning with the DNSP Ergon

5.4.1 SUMMARY OF THE PROCESS AND METHODOLOGY

For the purpose of effective network planning, Essential Energy has collaborated in regular Joint Planning with Ergon as part of an established continual process. Necessary collaboration regarding network matters such as emerging constraints and planned developments have and are undertaken regularly, as required based on project need.

In 2025 continued Joint Planning between Essential Energy and Ergon regarding the provision of emergency alternate supply to each other. A staged implementation is planned.

5.4.2 INVESTMENTS JOINTLY PLANNED

Due to changes in prioritisation, this investment is likely to be completed by late 2026.

5.4.3 ADDITIONAL INFORMATION

Nil.

5.5 Results of Joint Planning with the DNSP Ausgrid

5.5.1 SUMMARY OF THE PROCESS AND METHODOLOGY

For the purpose of effective network planning, Essential Energy has collaborated in regular Joint Planning with Ausgrid as part of an established continual process. Necessary collaboration regarding network matters such as emerging constraints and planned developments have and are undertaken regularly, as required based on project need.

This is facilitated through face-to-face meetings or videoconferencing between Joint Planning representatives from both organisations. These interactions have formal agendas and minuted outcomes with assigned responsibilities. The Joint Planning representatives from Ausgrid and Essential Energy are from the respective Joint Planning teams and may from time-to-time consist of representatives from specialist technical teams outside of network planning.

In 2025, there has been one formal Joint Planning meeting with Ausgrid. This discussed load growth in fringe areas where one DNSP is providing supply to the other and impacts this may have on future supply agreements in the area. Essential Energy is investigating the requirement for a new substation in this area. The outcome of this meeting was to confirm load forecasts and continue discussions in regard to supply options.

5.5.2 INVESTMENTS JOINTLY PLANNED

Nil.

5.5.3 ADDITIONAL INFORMATION

Nil.

5.6 Results of Joint Planning with the DNSP Endeavour Energy

5.6.1 SUMMARY OF THE PROCESS AND METHODOLOGY

For the purpose of effective network planning, Essential Energy has collaborated in regular Joint Planning with Endeavour Energy as part of an established continual process. Necessary collaboration regarding network matters such as emerging constraints and planned developments have and are undertaken regularly, as required based on project need.

This is facilitated through face-to-face meetings or videoconferencing between Joint Planning representatives from both organisations. These interactions have formal agendas and minuted outcomes with assigned responsibilities. The Joint Planning representatives from Endeavour Energy and Essential Energy are from the respective Joint Planning teams and may from time-to-time consist of representatives from specialist technical teams outside of network planning.

During 2025, there has been no material need to conduct formal Joint Planning with Endeavour Energy. Joint Planning has been limited to a few telephone/email discussions between the respective network planning and customer connections teams.

5.6.2 INVESTMENTS JOINTLY PLANNED

Nil.

5.6.3 ADDITIONAL INFORMATION

Nil.

5.7 Results of Joint Planning with the DNSP Evoenergy

5.7.1 SUMMARY OF THE PROCESS AND METHODOLOGY

For the purpose of effective network planning, Essential Energy has collaborated in regular Joint Planning with Evoenergy as part of an established continual process. Necessary collaboration regarding network matters such as emerging constraints and planned developments have and are undertaken regularly, as required, based on project need.

This is facilitated through face-to-face meetings or videoconferencing between Joint Planning representatives from both organisations. These interactions have formal agendas and minuted outcomes with assigned responsibilities. The Joint Planning representatives from Evoenergy and Essential Energy are from the respective Joint Planning teams and may from time-to-time consist of representatives from specialist technical teams outside of network planning.

During 2025, Joint Planning has been limited to a few telephone/email discussions between the respective network planning and customer connections teams. Regarding several proposed large spot loads, capability of each other’s network and finding the least cost supply option.

5.7.2 INVESTMENTS JOINTLY PLANNED

Nil.

5.7.3 ADDITIONAL INFORMATION

Nil.

5.8 Results of Joint Planning with the DNSP Powercor Australia

5.8.1 SUMMARY OF THE PROCESS AND METHODOLOGY

For the purpose of effective network planning, Essential Energy has collaborated in regular Joint Planning with Powercor Australia as part of an established continual process. Necessary collaboration regarding network matters such as emerging constraints and planned developments have and are undertaken regularly, as required based on project need.

This is facilitated through face-to-face meetings or videoconferencing between Joint Planning representatives from both organisations. These interactions have formal agendas and minuted outcomes with assigned responsibilities. The Joint Planning representatives from Powercor and Essential Energy are from the respective Joint Planning teams and may from time-to-time consist of representatives from specialist technical teams outside of network planning.

In 2025, there has been no material need to conduct formal Joint Planning meetings with Powercor Australia. This is mainly due to the fact that no limitations on the interconnecting 66kV and 22kV networks are imminent. Joint Planning has therefore been limited to a few telephone/email discussions between the respective network planning, system operations and customer connection teams.

5.8.2 INVESTMENTS JOINTLY PLANNED

Nil.

5.8.3 ADDITIONAL INFORMATION

Nil.

6. NETWORK PERFORMANCE

6.1 Reliability Performance

Reporting is in accordance with the excluded interruption conditions of the STPIS and Licence Conditions, which include the removal of days where the distribution network exceeds the defined major event day threshold. The reliability measures used are SAIDI, average minutes without supply per customer, and SAIFI, average number of interruptions experienced per customer. Performance is monitored at distribution feeder level for unplanned interruptions.

Under AER STPIS reporting, distribution feeders are categorised as Urban, Short Rural, or Long Rural, based on feeder length and load density. Reliability performance (6.1.1) is measured by feeder categories against AER STPIS targets.

As of 2024/25, under IPART Electricity Distribution Reliability Standards (Licence Conditions), distribution feeders are categorised as Short or Long Feeders, where Long Feeders are greater than 500km. Essential Energy's distribution network consists of 1421 Short Feeders and 48 Long Feeders. Individual Feeder Performance, LV SAPS Performance, and Direct Connections (previously Individual Customers) Performance is measured against Licence Conditions targets.

Audits are conducted over this information as part of the Annual Information Orders to AER on compliance with STPIS Guidelines, and Annual Reliability and Performance Licence Conditions to IPART on compliance with Electricity Distribution Reliability Standards.

6.1.1 RELIABILITY PERFORMANCE AGAINST AER STPIS TARGETS 2024/25

AER STPIS Reliability performance standards were met for all feeder categories in 2024/25 except Urban and Short Rural SAIDI. The normalised Network Availability for the 2024/25 financial year was 99.96%.

Table 14: Reliability performance against the AER STPIS Targets 2024/25

FEEDER CATEGORY	SAIDI (MINUTES)		SAIFI (NO OF INTERRUPTIONS)	
	TARGETS	ACTUAL	TARGETS	ACTUAL
Urban	71.65	72	0.854	0.80
Short Rural	210.34	224	1.719	1.65
Long Rural	497.73	486	2.810	2.63

6.1.2 INDIVIDUAL FEEDER/LV SAPS/DIRECT CONNECTION PERFORMANCE AGAINST LICENCE CONDITION STANDARDS 2024/25

The performance objectives for organisational average performances by feeder category are not sufficient to identify when customers on a particular feeder experience unsatisfactory reliability performance. For this reason, SAIDI and SAIFI criteria (after 'excluded interruptions' are disregarded) act as a trigger for investigation and exception reporting purposes. The figures contained in the licence conditions are shown in Table 15.

Table 15: Individual feeder/LV SAPS/Direct Connection standards specified in the Licence Conditions 2024/25

STANDARD	SAIDI	SAIFI
SHORT FEEDER	=262+108√Length + MIN(160,5500/Length)	=3.1 + 0.44√Length + MIN(0.65,21/Length)
LONG FEEDER	2688	13
LV SAPS	1817	9.4
DIRECT CONNECTION	530	4.2

Performance outside this range results in the following actions:

- Immediate investigation of the causes for each feeder/LV SAPS/direct connection exceeding the standards
- By the end of the quarter following the quarter in which the feeder/LV SAPS/direct connection first exceeded the standard, complete an investigation report identifying the causes and action required to improve the performance
- Complete any operational actions identified in the investigation report by the end of the third quarter following the quarter in which the feeder/LV SAPS/direct connection first exceeded the standard. Remedial actions could include but are not limited to installing or reconfiguring network protection devices, out of schedule asset inspections and out of schedule vegetation inspections
- Where the investigation report identifies actions, other than operational actions, that are required to improve the performance, an investment plan is developed. The investment plan includes an implementation timetable of required capital works. This timetable details the commencement of implementation by the end of the second quarter following the quarter in which the feeder/LV SAPS/direct connection first exceeded the standards. Remedial actions could include but are not limited to reconductoring sections of line, segmenting the network with gas switch or installation of additional protection devices and installing Line Fault Indicators (LFI) to enable increased fault finding and restoration efficiency.

Table 16: Individual feeder performance against the standard 2024/25

INDIVIDUAL FEEDER PERFORMANCE	SHORT FEEDER	LONG FEEDER
Feeders (Total Number each Type)	1421	48
Feeders that Exceeded the Standard During the Year (Total Number)	130	9

Table 17: Low Voltage SAPS performance against the standard 2024/25

LV SAPS PERFORMANCE	2024/25
SAPS (Total Number)	3
SAPS that Exceeded the Standard During the Year (Total Number)	0

Table 18: Direct Connection performance against the standard 2024/25

DIRECT CONNECTION PERFORMANCE	2024/25
Instances where minutes interrupted exceeded the standard	1
Instances where number of interruptions exceeded the standard	1

6.2 Quality of Supply Performance

The Electricity Supply Standards adopted by Essential Energy are set out in the document CEOP8026 Electricity Supply Standard, in accordance with the Code of Practice – Electricity Service Standards. A copy of CEOP8026 can be downloaded from https://www.essentialenergy.com.au/.

CEOP8026 also outlines Essential Energy's adoption of the Australian Standard AS 61000.3.100 – 2011 (Amendment No.1 -2016) and Australian Standard AS 60038 – 2012 Standard Voltages.

The main areas addressed include:

- Voltage fluctuations (LV) managed in accordance with Australian Standards AS/NZS 61000.3.3:2012, SA/SNZ TS IEC 61000.3.5:2013 and SA/SNZ TR IEC 61000.3.5:2013
- Switching transients (voltage waveform distortion) limited where possible to less than twice normal supply voltage
- Frequency variation and Essential Energy's role in notifying AEMO of any sustained fluctuations
- Voltage swells and voltage dips (sags) managed through best practice network improvement and augmentation (Recommended voltage swell and dip thresholds given in Australian Standard AS 61000.3.100 – 2011 (Amendment No.1 -2016)
- Steady state voltage differences between neutral and earth limited to less than 10 volts at the customer's point of supply
- Lightning strikes limited in their impact on supply where possible by adherence to industry best practice system design and maintenance principles
- Limitation of 'step and touch' voltage differentials managed in accordance with industry standards, namely ENA EG-0 Power System Earthing Guide – ENA DOC 025-2010
- Essential Energy's objective is to limit voltage unbalance to levels as required by the National Electricity Rules. This is generally 2% on the high voltage network and up to 6% on the LV network using 10min average values. This level may be exceeded occasionally in some rural areas. However, Voltage Unbalance allocations for new customer connections are managed through the latest Australian Standard for Voltage Unbalance (AS/NZS TR IEC 61000.3.13:2012 and ENA Guideline for Power Quality – Voltage Unbalance)
- Harmonic content of voltage and current waveforms managed in accordance with Australian Standards AS/NZS TR IEC 61000.3.6:2012. Harmonic emission allocation process for new customer connections are managed through the Australian Standard and ENA Guideline for Power Quality – Harmonics
- Voltage fluctuations, flicker, and rapid voltage changes in HV network are managed in accordance with AS/NZS TR IEC 61000.3.7:2012 Standard. Like the harmonics and unbalance, all the new HV customer connections and emissions allocations are managed through the latest Australian standard and the ENA Guideline for Power Quality – Flicker

- Mains signalling reliability set at a target of 99.5 per cent failsafe to ensure correct switching and metering functions.

Quality of supply is monitored through power quality enquiries received from customers and also through participation in the Power Quality Compliance Audit conducted by the University of Wollongong and a number of other distributors throughout Australia. This survey studies parameters such as steady state voltage, voltage total harmonic distortion (THD), voltage sags and voltage unbalance on three phase sites.

All valid complaints assessed as being network related, or issues identified via network monitoring are addressed to ensure the situation is rectified and maintained within standards.

Remedial actions could include but are not limited to adjusting tap settings on transformers, adjusting voltage regulation levels, installing additional or larger transformers, augmenting network capacity, repairing network faults and balancing network loads.

Table 19: Quality of Supply Results

NETWORK COMPLAINT INVESTIGATIONS COMPLETED		**2024/25**	
CATEGORY	**NATURE OF COMPLAINT**	**NUMBER**	**NUMBER VALID**
Voltage	Sustained over voltage	98	82
	Sustained under voltage	63	45
	Voltage fluctuations	58	24
	Voltage dips	27	13
	Voltage swell	5	4
	Switching transients	1	0
	N-E voltage difference	99	52
	Ground fault voltage	7	4
	Voltage unbalance	7	3
	Mains signalling voltages (Outside defined range)	2	1
	HV injection (HV/LV Intermix)	0	0
	Notching	6	3
SUBTOTAL (SUPPLY VOLTAGE COMPLAINTS)		**373**	**231**
Current	Direct Current	0	0
	Harmonic Content	0	0
	Inter Harmonics	3	0
SUBTOTAL (SUPPLY CURRENT COMPLAINTS)		**3**	**0**
Other Quality	Mains signalling reliability	0	0

NETWORK COMPLAINT INVESTIGATIONS COMPLETED		2024/25	
CATEGORY	**NATURE OF COMPLAINT**	**NUMBER**	**NUMBER VALID**
	Noise & Interference	2	1
	Level of supply capacity	30	22
	Embedded Generation (Solar)	191	138
	Embedded Generation (Wind)	1	0
	Supply frequency	1	0
	Level of EMF	1	0
	Customer Equipment Failure	114	24
SUBTOTAL (OTHER QUALITY OF SUPPLY COMPLAINTS)		**340**	**184**
SUBTOTAL (ALL QUALITY OF SUPPLY COMPLAINTS)		**716**	**415**
Reliability	No. of supply failures	44	20
	Duration of supply failures	10	5
	Outages Miscellaneous	16	9
	No. of <1 min. interruptions	18	7
SUBTOTAL (RELIABILITY OF SUPPLY)		**88**	**41**
TOTAL COMPLETED		**804**	**456**
Other	Under Investigation (not validated)	1	
TOTAL		**805**	**456**

The total number of FY25 Network Complaints decreased by almost 15% compared to FY24 (805 vs 944). Embedded Generation Solar continued to be the leading complaint with a total of 191 complaints although it continues to see a steady decrease, this year down 31% similar to previous years.

The total number of Sustained Over Voltage complaints decreased by 11% and the total number of Sustained Under Voltage increased by 10% compared to last year.

6.3 Frequency Control and Protection Systems

There have been no operations of load shedding, inter-tripping or generator runback schemes on the EE network which have caused negative adverse impacts on the security of the NEM. Neither does Essential Energy expect a cascading outage or major supply disruption to be caused by any of our protection system operation or interactions.

6.4 System Strength Locational Factors

Essential Energy network system strength is impacted by several factors including the upstream network system strength, the number of inverter-based generating systems connected, the network connectivity and is also highly dependent on the location.

The System Strength Location Factor (SSLF) is a critical indicator of the availability of system strength when a generating system is aiming to connect to the Essential Energy network. The SSLF highly depends on the exact location of the proposed connection point and any network development will impact the SSLF. Essential Energy works closely with Transgrid and uses the information provided by Transgrid to calculate the SSLF in our network. The SSLF of Transgrid Transmission substations can be found using the Transgrid TAPR[6]. The latest SSLF will be provided to the connection application as part of Preliminary Assessment response to a Connection Enquiry. Please contact Essential Energy Network Connections team (networkconnections@essentialenergy.com.au) for information on how to submit a Connection Enquiry.

[6] https://tapr.transgrid.com.au/

7. ASSET MANAGEMENT

7.1 Essential Energy's Asset Management Approach

7.1.1 INTRODUCTION

Essential Energy has recertified against AS ISO 55001:2014 in October 2024 and is continuing to grow its asset management maturity through its own endeavours, keeping abreast of developments domestically and abroad, all underpinned with a commitment to enable a safe, resilient and reliable network service that meet the needs of its customers and stakeholders.

7.1.2 THE ASSET MANAGEMENT SYSTEM

The present format of Essential Energy's Asset Management System Framework includes:

- Asset Management Policy Statement – This document's the key asset management principles in which the Asset Management System (AMS) adheres to
- Strategic Asset Management Plan (SAMP) – Is comprised of a combination of documents. A dynamic landscape of documentation that outlines our strategic plans. The dynamic landscape ranges across our corporate strategy (refreshed multiple times within a regulatory period), our regulatory submission to the AER and supporting artefacts, and optimisation outcomes provided by a best of breed portfolio optimisation platform
- Asset Management Objectives (AMOs) – Defines the key outcomes that will be delivered to our customers through specific asset management activities and by the Asset Management System. The Objectives provide direction to help ensure the network, systems and assets deliver what we need and are used to set service targets and measures so performance can be tracked. The AMOs are key to ensuring we meet our service targets and identifying continuous improvement opportunities
- Network, Asset Class and System strategies – Form the Asset Management direction and perform Asset Lifecycle analysis in order for Essential Energy to understand the activities it must undertake to get the outcomes it needs from its assets in support of its asset management objectives. These strategies set direction for the business in establishing programs of work to manage the network Essential Energy is accountable for
- Asset Management Planning and Optimisation – Network investments are initiated, planned, developed, and optimised through the coordinated activities of several functions across the business including Planning, Network Design, Network Portfolio, Investment Optimisation and Network Delivery. Investment identification is influenced by the content of the above strategies; preferred investments are identified through application of a range of decision-making criteria and optimised within Essential Energy's Asset Investment Planning software. These investments, together with additional mandatory projects, programs and cyclic maintenance-related activities form our Network Portfolio which is approved, managed, and governed using well-established practices
- Lifecycle Delivery – The Network Portfolio is delivered through the coordinated activities of the Network Portfolio, Network Delivery and Network Operations teams through the development of Works Programs and Packaging and Scheduling activities. It drives the outcomes at each stage of an asset's lifecycle, from analysis, to planning, operating and maintaining the asset, and eventually disposing of it
- Performance Monitoring – Essential Energy is a complex business and the design of how it monitors performance enables metrics to be placed in a logical way that supports the understanding of performance on assets (i.e. asset health), asset management performance (including financial and non-financial performance) and the asset management system (i.e. effectiveness of the outputs of the

processes, procedures etc). We monitor performance of our network through the output measures of our asset management objectives

- Performance Evaluation and Improvements – We evaluate the performance of our network to ensure our service targets are met and appropriate management actions identified to improve the performance of our network.

7.2 Network and Asset Strategies

The following sections detail the specifics of Essential Energy's network and asset lifecycle management strategies to provide an overview of the high-level direction used to manage network performance.

7.2.1 DISTRIBUTION GROWTH STRATEGY

The purpose of this document is to provide input into Essential Energy's asset management functions and ensure the coordinated management of growth activities. The Strategy covers measuring, monitoring, optimising and augmenting capacity and supply quality across Essential Energy's distribution network.

The strategy was developed to:

- Instil a systematic and consistent approach to managing demand and load growth throughout our asset management functions;
- Alignment with asset management objectives and regulatory submission;
- Define the components that constitute distribution network peak demand and load growth, their impacts, and how these components need to be managed; and
- Support continued investment for network optimisation, augmentation, and growth management.

It includes investments that will increase our active monitoring capabilities for network load and demand growth and voltage performance, which will assist with system optimisation and maximise network utilisation. These investments will allow for the deferral, reduction, or cancellation of investments to cater for demand growth on some parts of the network.

7.2.2 NETWORK RELIABILITY STRATEGY

Essential Energy's Network Reliability Strategy[7] provides direction to ensure compliance with NSW Reliability and Performance Licence Conditions for Electricity Distributors, the National Electricity Rules and Essential Energy's corporate objectives. The strategy defines the approach to achieving targets set for the duration and frequency of both planned and unplanned interruptions to network supply, considering the business objectives to maintain overall reliability, improve reliability to worst-served customers and ensure compliance with NSW Reliability and Performance Licence Conditions for Electricity Distributors.

This strategy sets the targets to meet customer, regulatory and other stakeholder expectations, and meet licence conditions through a comprehensive approach across all asset classes in addition to identifying actions to improve the future management of reliability.

Key components of the reliability strategy include short- and long-term views of:

- Unavailability and Frequency duration measures – SAIDI and SAIFI;
- Outage response measures – CAIDI;

[7] This strategy is independent of the Service Target Performance Incentive Scheme (STPIS) Strategy that details the organisations approach to maximising return from the Australian Energy Regulator's reliability targets and revenue model

- Maintenance of Material Non-Compliances against IPART Reliability Licence Standards and reporting Conditions;
- Cumulative SAIDI on worst performing feeder segments; and
- Number of planned customer interruptions per annum.

7.2.3 NETWORK POWER QUALITY STRATEGY

Essential Energy's Power Quality (PQ) strategy provides strategic direction for the business on asset management targets and initiatives to ensure that Power Quality obligations are met.

The Network PQ Strategy works in conjunction with relevant network and asset class strategies, and will:

- Achieve and maintain compliance with Power Quality standards
  - Achieve and maintain compliance with Power Quality standards including relevant regulations and policies, while ensuring appropriate value add commercial trade-off; and
  - Assist with setting up the associated network configuration and organisational processes with adjacent network strategies and stakeholders for execution
- Maximise value from PQ issue resolution through increased visibility
  - Maximise the value from PQ issue resolution by assessing the risk and value trade-offs; and
  - Ensure responses to PQ issues are provided appropriate prioritisation consistent with Essential Energy's value and risk framework.
- Improve customers PQ complaint resolution experience
  - Assist with improving the PQ issue response time frame by refining the workflow management tool/monitoring systems, organisational processes, and accountabilities by creating a complete end to end process to monitor and track PQ issue resolution times to ensure timely response to customer complaints;
  - Establish PQ resolution KPIs that align with corporate goals to ensure accountability during the resolution process; and
  - Ensure responses to PQ issues are provided appropriate prioritisation consistent with Essential Energy's value and risk framework that will improve the customers PQ experience.

The elements of the overall Power Quality strategy are:

7.2.4 REACTIVE MEASURES

- Investigate received power quality complaints and customer feedback quickly and efficiently;
- Verify that power quality problems are indeed network related and are outside the levels prescribed in Electricity Supply Standards;
- Rectify any local or wider area problems in a timely, economic, and effective manner, including the use of alternate remediation solutions; and
- Consult with and keep customers advised during all steps of the investigation and rectification process.

7.2.5 PROACTIVE MEASURES

- Migrate towards a more proactive power quality management approach through improved visibility of network power quality performance delivered by leveraging the rollout of network technology and monitoring equipment. This is supported by the power quality emissions allocations process for new customer connections to capture the background Power Quality measurement information which is based on methodologies given in ENA Guides for Power Quality by means of advanced modelling in SINCAL power system analysis software;

- Plan and implement a gradual migration in the median distribution voltage to 230 volts, in line with Australian Standard AS 61000.3.100 – 2011 (Amendment No.1 – 2016), which will minimise overvoltage situations and provide 'headroom' for distributed generation;
- Systematic modelling and management of HV feeder voltage profiles and performance; and
- Improved management of new and additional loads and embedded generator connections.

7.2.6 NETWORK SAFETY STRATEGY

Essential Energy's Network Safety Strategy provides direction to manage the network safety risk of the electricity network so far as is reasonably practicable (SFAIRP). The strategy has been developed to guide decision making within a framework of corporate risk tolerance, customer expectations and legislative requirements.

The strategy covers the measurement, monitoring, management of network safety and is complemented by existing procedures that form Essential Energy's Electrical Network Safety Management System (ENSMS) and Risk Management Framework.

Safety has and always will be a priority consideration for Essential Energy at all stages of the asset management lifecycle including planning, design, procurement, construction, commissioning, operation, maintenance and ultimately de-commissioning and disposal or recycling.

This strategy aligns with obligations under legislative instruments to ensure that asset management activities adhere to the principle of managing network risk, So Far As Is Reasonably Practicable (SFAIRP).

Key components of the safety strategy include:

- An uplift in organisational knowledge of SFAIRP principles and the Electricity Network Safety Management System (ENSMS);
- The development of a clear line of sight to corporate metrics and asset class strategies to embed the management of safety performance;
- The application of investment tools within the asset class strategies that facilitate the management of asset safety risk within the corporate risk appetite;
- Investigation of a mechanism to regularly obtain and quantify the value placed by customers on asset safety performance;
- Development of a Formal Safety Assessment (FSA) control register to allow mapping of controls to responsible business units; and
- Improved detailed causal data for safety incidents through linkages to asset failure data.

7.2.7 NETWORK SUSTAINABILITY STRATEGY

Essential Energy's Sustainability Strategy provides visibility of sustainability objectives as they relate to network assets, and direction on how to achieve these objectives. This will enable Essential Energy to implement asset management plans that optimise social, environmental, and financial benefits to improve the quality of life of Essential Energy's stakeholders now and in the future.

The Strategy applies sustainability in a holistic sense and takes into consideration the environmental, social and financial impacts to Essential Energy's assets and network utilisation. This is achieved by considering the interests and well-being of customers and employees, environmental health, and resource availability.

Key components of the sustainability strategy include consideration of:

- Minimise risk to the environment SFAIRP through the application of Environment Formal Safety Assessment
- Map and maintain compliance with obligations and regulatory requirements for sustainability risk
- Manage (network) sustainability risk within the corporate risk appetite through;
  - Analysing sustainability risk and determining those that are material;
  - Incorporating material sustainability risks in the Network Risk Register;
  - Updating the Asset Management Decision Making Guideline to consider the identified sustainability risks; and
  - Incorporating the (material) sustainability factors in the Appraisal Value Framework.
- Improve network sustainability performance though maturing methodologies used to measure the impacts on sustainability and defining the right metrics and key performance indicators
- Minimise network whole of life cost by valuing sustainability impacts throughout the asset lifecycle including quantifying the NPV.

7.2.8 ASSET INTERVENTION AND RETIREMENT STRATEGY

Essential Energy's Asset Intervention and Retirement Strategy provides direction across the business and all network asset classes on asset end of life planning to ensure that network assets continue to meet the company's corporate and asset management objectives.

Strategic direction of the Strategy includes:

- requirement to follow a standardised set of criteria to identify when there is a need for intervention across the network. Need decision process includes:
  - A change to an asset's required level of service;
  - A change to an asset's ability to meet an existing level of service;
  - An alternative opportunity becoming available which provides a different least cost option;
  - Ability to forecast end of life (Probability of Failure and Consequence of Failure modelling maturity, service level requirement definition); and
  - Availability of economic data to assess cost to serve.
- required to consider a minimum set of intervention options when responding to an asset's predicted end of life, to ensure that the required level of service is maintained at the least cost to serve. The range and depth of credible options considered should be commensurate with the investment value, but at a minimum should include:
  - A base case, which looks at the cost of continuing business-as-usual;
  - A network replace case (including both distribution and sub transmission options where applicable); and
  - A non-network case which considers demand management, asset derating, standalone power systems, or similar solution.

7.2.9 NETWORK BUSHFIRE PREVENTION STRATEGY

Essential Energy's bushfire and risk management strategy aims to prevent or minimise the impacts of fire ignition from electrical assets, so far as is reasonably practicable. The following strategic elements are those relating more specifically to bushfire prevention even though many others exist which may have an indirect relationship. Bushfire prevention strategies include:

- Identification of high bushfire risk zones to ensure planning, design, construction, operations, and maintenance activities are undertaken with an increased awareness of bushfire start risk;
- Consideration of bushfire risk in network asset planning and design decisions;
- Prioritisation of asset inspection[8] and maintenance with a focus on high fire risk areas, helping to ensure fire start risks are identified and appropriately actioned ;
- The completion of vegetation management in the form of tree cutting and clearing to manage the risk of trees or vegetation coming into contact with live lines or equipment and igniting fires;
- The provision of advice and information to owners of private lines to inform them of fire risks on their lines and to make recommendations on risk control actions. Where no action is taken to correct defects on private lines within the prescribed notice period in high bushfire risk areas, Essential Energy will undertake works to correct the defect on a "do and charge" basis;
- The implementation of operational limitations[9] on total fire ban days to minimise the risk of lines or equipment inadvertently starting a bushfire;
- The implementation of enhanced and high speed protection setting on total fire ban days to minimise the risk of lines or equipment inadvertently starting a bushfire;
- Perform line patrols before restoration on total fire ban days; and
- Analysis of fire starts proven to be caused by Essential Energy's network and completion of root cause analysis to identify improved control or prevention measures that can be instituted or developed.

7.2.10 NETWORK SECURITY STRATEGY

This strategy provides visibility of Essential's Energy's security objectives as they relate to the unauthorised access to network assets and provides direction on how to achieve these objectives. The Network Security Strategy addresses asset management and engineering's strategy for the prevention of unauthorised access to:

- Network assets;
- Network operational technology; and
- Network communications systems.

The strategy is primarily focused on preventing unauthorised access events that results in the possibility of harm or disruption of the network.

Strategic direction targets include:

- Prevent harm to the public or physical disruption to network assets as a result of unauthorised access
  - Establish line of sight between the physical and cyber security frameworks and asset class strategies as outlined in the figure to the right. These frameworks specify the factors effecting the likelihood and controls for security incidents, where the Asset Class Strategies provide the consequences to ensure appropriate controls are implemented. These frameworks also govern the processes for reporting and ongoing assessment.
- Maintain compliance with network security obligations and regulatory requirements

[8] Asset inspection includes the use of LiDAR and pre-bushfire season annual fly over inspection of the network.

[9] Operational limitations of auto reclose operations on specific circuit breakers on total fire ban days.

– Develop a clear line of sight between the compliance drivers of network security and the responsible business units. Incorporate responsibilities mapped between the Formal Safety Assessment Controls and the business units responsible for managing performance.

7.2.11 NETWORK ASSET CLASS STRATEGIES

Essential Energy's Asset Class strategies seek to ensure that network assets continue to achieve service level obligations while optimising the lifecycle costs. They describe the assets within each class, contain a SWOT analysis and use Probability of Failure and Consequence of Failure models to define the level of risk the asset class presents. They use the AMOs and the strategic direction provided through the Network Strategies to set measures and targets at an asset level, provide strategic directions of their own across the lifecycle and present a cost, risk and performance profile over a 20-year period. Elements considered in these strategies include inspection, maintenance, refurbishment, replacement, and disposal.

Intervention within the strategies can be categorised as either:

- Time-based: requiring asset treatments based on set time intervals;
- Condition-based: requiring asset treatments based on identified asset condition or asset health;
- Risk-based: requiring asset treatments based on the risk of asset failure, including consideration of the likelihood and consequence(s) of failure based on observed risk factors; or
- Predictive: requiring asset treatments based on consideration of the outputs of predictive analytics, particularly relating to the likelihood of asset failure.

Strategies will identify the optimum timing for treatment, including whether this is preventative or corrective, based on an understanding of the risks and costs associated with alternative practicable options.

7.2.12 ASSET VALUE, RISK MANAGEMENT AND NETWORK OPTIMISATION

Essential Energy has adopted a risk-based approach to achieving performance objectives from network assets at optimum whole of life cost.

- Asset Risk Management is the overarching risk assessment framework. It provides a consistent approach for calculating risk value from understanding an asset's probability of failure and likelihood of consequence across Essential Energy's network assets. It also provides the approach for undertaking risk evaluation and identifying risk treatments
- Appraisal Value Framework is the framework for monetising different types and levels of consequence resulting from network asset failures. This supports the asset risk management procedure towards a monetised risk and value-based approach to asset management decision making
- Risk Informed Optimisation is the methodology used for optimising a portfolio of investment. Using a risk-informed approach, Essential Energy develops a prudent and efficient portfolio of expenditure which provides improved value within a reasonable financial constraint. Essential Energy will conti6nue to refine the portfolio and optimisation process as improvements are made to data, systems and modelling.

7.3 Treatment of Distribution Losses

Distribution losses refer to the losses incurred in transporting energy across the distribution network. Of the total 2024/25 energy input into Essential Energy's widely spread network, 5.01 per cent was consumed in the form of network losses.

Essential Energy's investment decisions are guided primarily by the need to achieve the service level obligations at the optimum lifecycle cost. The value of network losses is used in comparing alternative network or non-network solutions, which either act to reduce the average current through the network or lower the resistance. Accordingly, Essential Energy's approach ensures that the value of network losses influences decision making with respect to:

- Any network planning and subsequent augmentation specifically the selection of voltage, conductor and transformers;
- Network performance, operation and switching;
- Asset maintenance and replacement decisions; and
- Procurement of equipment.

Network losses are considered in the investment development stage, as well as in the detailed planning and approval stages.

7.4 Asset Issues Impacting Identified System Limitations

Network limitations are identified in the preparation of long-term network strategies. These limitations are then subject to detailed planning studies which consider any related issues arising from individual asset management strategies which are likely to have a material impact on the studied network.

The detailed planning studies include an assessment of non-network alternatives, fault levels, voltage levels, quality of supply considerations, asset replacement, asset refurbishments and new connection applications.

Present Value analysis is used to align the constraint solutions with other network requirements and optimise the investment profile to achieve service level obligations at the lowest lifecycle cost.

7.5 Obtaining Further Information on the Asset Management Strategy and Methodology

Further information on Essential Energy's asset management approach is available by contacting:

Essential Energy

Dene Ward

PO Box 5730

Port Macquarie NSW 2444

Email: dene.ward@essentialenergy.com.au

8. DEMAND MANAGEMENT

8.1 Demand Management Activities in the Preceding Year

Essential Energy's internal demand management procedures for 2024/25 complied with the obligations set out in the National Electricity Rules.

8.2 Innovative Demand Management Developments in 2024/25

8.2.1 PREPARATION FOR THE NSW BACKSTOP MANDATE

In anticipation of the forthcoming NSW backstop mandate, Essential Energy undertook a series of initiatives to ensure operational readiness and compliance. Dedicated resources were recruited to establish the operational foundation required for managing the CSIP-AUS utility server. These personnel also facilitated engagement with external stakeholders, offering guidance and coordination throughout the deployment stages.

To build internal expertise, Essential Energy developed a comprehensive base knowledge in CSIP-AUS and its connection to emergency backstop requirements. This involved participating in external training sessions and establishing new procedures and processes tailored to these needs. The Demand Management Operations team played a pivotal role in finalising the deployment of the CSIP-AUS utility server through a thorough assessment of operational requirements and User Acceptance Testing.

8.2.2 DEVELOPMENT OF THE DYNAMIC LOAD CONTROL PROGRAM

Essential Energy achieved a significant milestone by signing an agreement with a leading Australian retailer for the first dynamic hot water load shifting program. This partnership enabled orchestration of more than 50,000 household hot water systems, representing a peak demand reduction of approximately 150MW. This innovative approach to demand flexibility delivers multiple benefits, including reduced costs for retailers and customers, a lower carbon footprint from hot water heating, and mitigation of minimum system load risks.

To support this program, Essential Energy established new operational procedures and developed monitoring dashboards for real-time or near real-time tracking of load shifting activities. This capability ensures that load shifting outcomes are continually monitored to prevent any negative impacts on the network and allows for prompt issue identification and resolution. These measures were crucial for expanding the dynamic load program and provided Essential Energy with confidence in managing potential risks.

Further, Essential Energy engaged additional retailers who demonstrated a proactive approach in orchestrating hot water systems. These engagements clearly indicate intent, and negotiations are underway to reach similar agreements. The organisation anticipates further positive outcomes in FY26.

8.2.3 DEVELOPMENT OF DYNAMIC CONNECTIONS

Essential Energy focused on leveraging the ANU CSIP-AUS utility server to explore the application of Dynamic Operation Envelopes (DOEs) with battery storage systems. The pole top batteries, part of a joint initiative with Origin Energy, were selected for this demonstration. During the year, Essential Energy successfully linked the ANU utility server with Origin to transmit DOEs. Subsequent optimisations were performed to balance network objectives with wholesale market orchestration goals, alongside troubleshooting several early-phase issues.

8.3 Plans for demand management and embedded generation

- Expand the Dynamic Load Control Hot Water program by engaging additional retailers and increasing customer participation. The scale of optimization will be determined by retailer involvement. Essential Energy will continue to advance its capabilities with the objective of achieving a fully dynamic program for all hot water systems across the network.
- Prepare for the NSW emergency backstop mandate by establishing the technical and organizational capacity to remotely monitor and control solar generation export and output levels. Essential Energy aims to achieve full operational readiness by the end of FY26, in alignment with anticipated regulatory changes. This includes close coordination with other NSW DNSPs and the NSW Department of Climate Change, Energy, Environment and Water.
- Support electric vehicle (EV) integration by initiating trials to demonstrate the use of the CSIP-AUS protocol and utility server for optimizing EV chargers. This will involve collaboration with internal and external stakeholders to identify and implement innovative solutions.

8.4 Issues arising from applications to connect embedded generation

Essential Energy's distribution network continues to experience an increasing number of isolated issues relating to voltage rise from embedded generation units, resulting in over voltage tripping of the inverters, and in some cases supplying customers with voltages above Australian Standard limits.

Issues may arise where the service, consumer mains and/or submains conductor is incorrectly sized, incorrectly identified, or the maximum system output is calculated based on an underestimated conductor length. There are also issues that revolve around voltage rise along the low voltage distribution network due to a high penetration of embedded generation within localised areas. This issue typically arises in overhead network areas consisting of original overhead network low voltage conductor.

Export limited inverters have allowed for the reduction in voltage rise issues at the customer's switchboard and provides greater equity in systems where multiple customers share a single transformer. The export limit allows customers to install the most economically sized systems while capping the amount that can be fed back into the network. The embedded generation installer often nominates an export limit during the initial application, and Essential Energy has suggested appropriate export limits depending on network limitations and the size of the installation.

As part of Essential Energy's commitment to improving network connection standards for the purpose of enhancing the solar PV hosting capacity of the network to drive higher utilisation of Consumer Energy Resources (CER) and the network, from September 2018 Essential Energy mandated Volt-VAr and Volt-Watt power quality response modes in alignment with AS4777.2 for all new Solar PV and battery storage installations. The new requirement assists with managing network voltage in high CER uptake areas of the network, increases the CER hosting capacity of the network, whilst minimising inverter tripping from excessive voltage rise on the network through the activation of 'soft' limits.

Going forward, Essential Energy will continue to identify more efficient options to address the issue of large increases in low voltage network voltage 'swing' brought about by localised pockets of embedded generation, for the long-term interests of customers. Based on learning outcomes from recent trials, such new methods to facilitate the effective and efficient uptake of embedded generation include but not limited to; a shift from static to dynamic connection standards (i.e. flexible exports), cost reflective pricing to drive efficient use of the network, and increased use of new network technologies, including on line tap changers (OLTCs) on LV transformers and LV static VAr compensators (LV STATCOMs).

Linked to the history of electricity distribution development within New South Wales, Essential Energy's network was planned, designed, and operated for peak load, due to such, reverse power flow for some areas of the high voltage network is resulting in abnormal asset operation, amplifying existing voltage rise issues and incorrect measurements from network monitoring equipment. Such emerging issues are driving changes to Essential Energy's Asset Management policies and procedures to ensure asset configuration and capability is compatible with reverse power flow conditions, in addition, voltage regulation practices across all levels of the network.

The integration of increasing numbers of embedded generators has required some minor changes to operational procedures. The use of Fameca FC3000 LV network identification equipment produces inconsistent results during times of reverse power flow, requiring local embedded generation to be temporarily disabled or use of the equipment outside of peak generation hours. When mobile diesel generation is used on LV street circuits during planned outages, solar installations resynchronise and supply real power only, requiring the mobile generation to supply much of the reactive power for the LV loads along with the small amount of remaining real power. This poor power factor or even reverse power can lead to tripping of the mobile generation. To prevent this, local embedded generation must be manually disabled during planned outages where temporary generators are used. The alternative of operating the generation outside the embedded generation anti islanding frequency range has not been adopted within Essential Energy.

There are a growing number of distribution substations experiencing high PV penetration, in extreme cases causing network protection to operate during maximum export. These areas are being investigated to verify network performance and to confirm PV installations are operating within their connection application limits to prevent these outages from occurring. Essential Energy is also implementing measures to increase overall CER compliance with applicable standards (mainly AS4777.2:2020) and export limits. Most notably, this includes implementation of a Network Visibility platform for proactive identification of non-compliances.

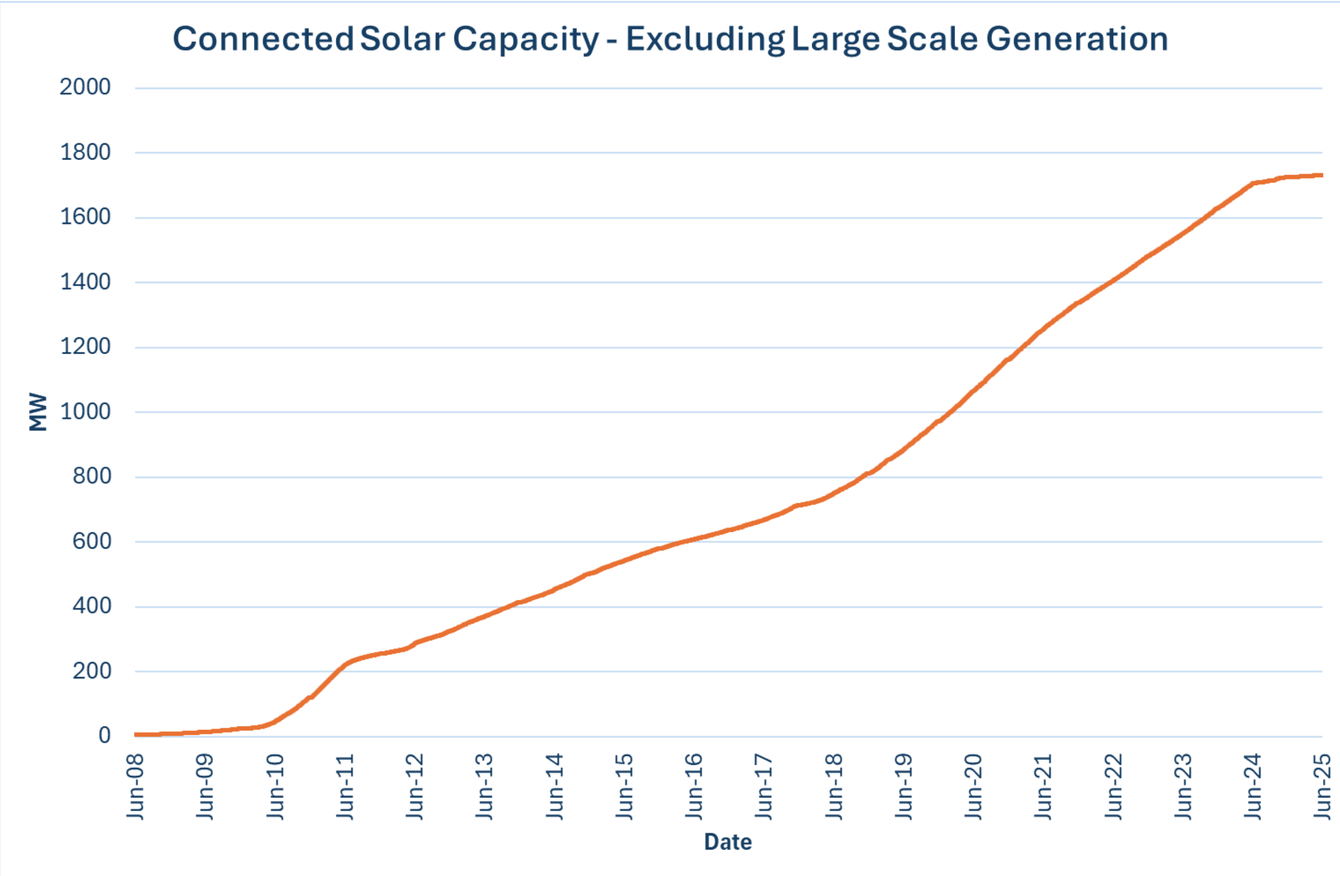


Figure 5: Installed Solar Capacity, Excluding Large Scale Generation

8.5 Non-Network Solutions

8.5.1 STANDALONE POWER SYSTEMS (SAPS)

Essential Energy's SAPS program is targeted at addressing a cost to service constraint for the fringe of grid, high cost to serve or low resilient areas of the distribution network. The cost to serve constraint is not an electrical limitation of the network, rather an economic constraint where alternative solutions such as SAPS are cheaper than a traditional network supply. As such all potential SAPS locations will be for single distribution substation sites which generally supply a single customer. Modelling has showed these locations are only viable on low consumption connections with demand generally less than 15 kVA. The transition of fringe of grid connections to a SAPS is unlikely to address any system limitations such as peak demand.

With the NSW Government adopting the AEMC National SAPS framework, Essential Energy is now implementing SAPS investments as a product to address high cost to serve connections. There are now three DNSP led SAPS in-service supplying single customers, with six more SAPS targeted for construction this financial year.

Essential Energy's SAPS will be deployed in compliance with the Ringfencing Guideline Version 3 released in November 2021, as such Essential Energy will provide the generation services as the SAPS resource provider under the category 1 classification. Essential Energy were the first DNSP to apply to AEMO for SAPS registration in November 2023.

Essential Energy's SAPS Customer Engagement Strategy defines that SAPS will only be deployed at sites where customers provide their explicit informed consent, as such the scale of SAPS investments will be subject to customer engagement processes. Our desire is to develop a customer engagement platform to educate and inform customers of the benefits of this transition to improve resilience, reliability and reduce costs for our customers.

The modelling to determine sites that are economically viable to transition to a DNSP led SAPS is improving, so the target number of SAPS installations is currently being reviewed. Essential Energy will continue to refine the modelling and strategy, and the SAPS program will increase deployments year on year. As these are installed, Essential Energy will remove unused poles and wires to reduce network-initiated bushfire risk and maintenance costs.

SAPS also play an important role in keeping communities connected during extreme weather events. In May 2024, Essential Energy secured close to $1 million in Australian Government grant funding from the Telecommunications Disaster Resilience Innovation (TDRI) Program to acquire 6 portable SAPS that will support communications during extreme weather events. The funding enabled the upgrade of 12 network communication sites historically vulnerable to flooding and bushfires, to facilitate temporary connection of the portable SAPS units.

Essential Energy's Australian-first trial of a hydrogen supported SAPS, for heritage accommodation in Myall Lakes National Park, ended in February 2024. The SAPS remains in service while we work through lessons learnt and next steps. The trial was a partnership with the NSW National Parks and Wildlife Service and GreenHy2.

8.5.2 BATTERIES

Essential Energy commissioned our first trial network battery in Port Macquarie in late 2022 as part of our program to develop battery storage on the distribution network. The project consisted of a 1 MW / 2MWh battery which is providing priority network services (dynamic voltage support and closed-loop thermal management) to defer the installation of an 11 kV voltage regulator and new zone substation. With a ringfencing waiver approved, the battery participates in the wholesale market, offering both energy arbitrage and Frequency Control Ancillary Services (FCAS), providing a comprehensive, value-stacked solution. Essential Energy has also implemented an islandable microgrid at Ivanhoe in central NSW to support the radial zone substation, and one at Tibooburra to improve network resilience for the remote community.

Essential Energy was successful in seeking funding for three community batteries, which have been installed in Leeton, Maloneys Beach and Goulburn during the year and are now trading in the NEM. The batteries are 192 kVA / 530 kWh, providing local communities with the opportunity to benefit from storage as a service. These batteries are providing Essential Energy with valuable experience in the areas of battery procurement, site design, third-party engagement and community engagement.

Essential Energy is trialling Low Voltage Poletop Battery technology through the installation of 37 batteries in FY24 and FY25. The project involves the installation of 19 EcoSTORE (EcoJoule), 40 kVA / 85 kWh and 18 PowerShaper (Pixii) 30 kVA / 72 kWh across five of Essential Energy's depot areas. The batteries primarily provide grid-support via peak shaving, volt-watt and volt-VAr support, solar (PV) support and reliability improvements (extend low voltage back-feed capacity). The batteries will participate in the wholesale market via energy arbitrage and offering FCAS services. The trial project aims to assess new ways in which Essential Energy can address network constraints whilst maximising the value and benefit to customers through incentives such as storage as a service. The trial also includes the application of Dynamic Operating Envelopes (DOEs), ensuring market activities do not impact existing network constraints. At the end of calendar year 2025, 37 poletop batteries and 3 ground mounted batteries have been installed.

Essential Energy is also trialling two network-only pole top battery technologies, each installed within a low voltage network with historical power quality constraints. This aims to assess the economic viability of batteries as a solution to network constraints. This also provides Essential Energy the flexibility to run real-world testing and scenario management to further learn and assess the benefits this technology may deliver.

Essential Energy has also released new battery tariffs from 1 July 2024. These tariffs are designed to incentivise behaviour to manage peak load, support solar charging, minimise network impact and maximise network benefit from batteries.

8.6 Embedded Generation Connection Details

We are unable to differentiate phone enquiries between embedded generation enquiries and general connection enquiries as only simple statistics are recorded. Battery storage can be installed independently or alongside embedded generation within the same application, so these figures are included within the generation connection applications processed.

The total number of applications processed has decreased this year for load and generation, while battery applications nearly doubled. The number of days to process applications has increased slightly this year.

Table 20: Connection Enquiries and Applications

CONNECTION ENQUIRIES AND APPLICATIONS	NUMBER 2024/25
Phone connection enquiries received	14,930
Online portal connection enquiries received	3,838
Load connection applications processed	9,305
Generation connection applications processed	27,839
Battery storage connection applications processed	8,197
Total connection applications received	43,531
Days to process connection applications	9.77

9. INFORMATION TECHNOLOGY AND COMMUNICATION SYSTEMS

9.1 Information Technology

This section of the document defines digital technologies Essential Energy has or is executing to effectively enable the business to deliver on its Customer, Regulatory and Stakeholder requirements. Table 21 outlines the functional area of implementation and a brief description of the investments for the 2024/25 period and Table 22 provides the areas of investment focus for the 2025/26 to 2026/27 period.

Table 21: Information Technology Investments 2024/25

FUNCTIONAL AREA	TECHNOLOGY INITIATIVE
Network Systems	Continuation of the implementation for required technology and associated capability to support the Future Networks Strategy
	Completion of the support and stabilisation of the new Enterprise Asset Management system (EAM) to improve integration to core systems and support best practice asset management capabilities
	Completion of the implementation of a Document Management solution to extend the Document Storage solution (from EAM) with a newer and more flexible technology
	Continuation of critical uplifts/enhancements to PowerOn Advantage and an associated PowerOn Mobile upgrade to provide a more stable and secure operating environment
	Completion of the uplift to the solution to manage Network Access Requests
	Planning for the uplift to Works Delivery including technology toolsets, integration and processes, and continued digitisation and automation of manual processes to enable field workers
Customer & Market Systems	Completion of the planning and design for the Market Systems, Network Billing and Meter Data systems replacement
	Completion of a revised solution for remediation of hazard data in existing systems, enable capture of new data and ensure it is provided in a timely manner to both Essential Energy staff and external parties to improve safety
	Implementation of new market compliance requirements to ensure that Essential Energy can continue to transact in the National Electricity Market (NEM) with the changes that are being implemented by AEMO as part of, or related to, the NEM2025 Reform program. This also included planning and design for the Australian Energy Market Operator (AEMO) changes for the Metering Services Review (MSR)
Enterprise Systems & Data Management	Delivery of the 2nd horizon of work for strengthening the core financial functions, through system, process, and data improvements, building on the work undertaken in ERP

FUNCTIONAL AREA	TECHNOLOGY INITIATIVE
	Establishment of several uplifts in IT Service Management processes and tools
	Commencement of the consolidation of all applicable data and reporting to a single instance of the Databricks data analytics platform using Lakehouse architecture
Technology Infrastructure & Telecommunications	Continuation of the technology infrastructure components and associated capability uplift of the digital transformation program including planning and design activities to increase data centre resilience and completion of a strategic integration platform
	Continuation of ongoing initiatives to continue to uplift Cyber resilience and maturity
	Replacement of client devices (including printers), in line with asset lifecycle requirements
	Upgrade of telecommunications infrastructure and end of life infrastructure
	Continuation of infrastructure upgrades at small depots to improve operational resilience and security posture.

Table 22: Information Technology Investments 2025/26 to 2026/27

FUNCTIONAL AREA	TECHNOLOGY INITIATIVE
Network Systems	Continuation of the implementation for required technology and associated capability to support the Future Networks Strategy
	Completion of critical uplifts/enhancements to PowerOn Advantage and an associated PowerOn Mobile upgrade to provide a more stable and secure operating environment
	Commencement of the planning for Geospatial Information Systems (GIS) and other network systems to enable advanced asset management capabilities
	Continuation of the uplift to Works Delivery including technology toolsets, integration and processes
Customer & Market Systems	Completion of the Market Systems, Network Billing and Meter Data systems replacement
	Implementation of the Australian Energy Market Operator (AEMO) changes for the Metering Services Review (MSR) along with any additional FY26 / FY27 AEMO related requirements identified
	Commencement of the planning to uplift Customer Relationship Management Systems
Enterprise Systems & Data Management	Completion of the 2nd horizon of strengthening the core financial functions, through system, process, and data improvements, building on the work undertaken in ERP and the initial optimisation scope

FUNCTIONAL AREA	TECHNOLOGY INITIATIVE
	Innovation with emerging technologies e.g. Artificial Intelligence
	Completion of the consolidation of all applicable data and reporting to a single instance of the Databricks data analytics platform using Lakehouse architecture
Technology Infrastructure & Telecommunications	Completion of the technology infrastructure components and associated capability uplift of the digital transformation, including data centre resilience (including consolidation / migration)
	Continuation of ongoing initiatives to continue to uplift Cyber resilience and maturity
	Replacement of client devices and telecommunications infrastructure in line with asset lifecycle requirements

Table 23: ICT Investment actual 2024/25 and forecast 2025/26 to 2029/30 (nominal $)

INVESTMENT	ACTUAL ($M)	FORECAST ($M)				
	FY25	FY26	FY27	FY28	FY29	FY30
Total ICT Investment	64.6	90.1	47.7	25.3	17.3	45.3

The significant expenditure in FY26 reflects the peak activity relating to Market Systems, Network Billing and Meter Data systems replacement, Future Networks technology and Data Centre Resilience.

10. REGIONAL DEVELOPMENT PLANS

The Essential Energy network is structured with the following hierarchy:

Operational Area

- Connection Point
  - Sub-transmission Line
    - Sub-transmission Substation
      - Zone Substation
        - Distribution Feeder.

Semi-geographic single line diagrams of the electrical network have been included alongside the supply area descriptions, with some diagrams covering multiple supply areas. Section 3 lists the operational area and supply area for each sub-transmission, zone substation and distribution feeder limitation. An interactive map of the network, including forecasts, limitations, and planned investments is available at https://dapr.essentialenergy.com.au/.

The map in Figure 6 shows the configuration of one region and ten operational areas. The map also includes the depots and offices associated with each area.

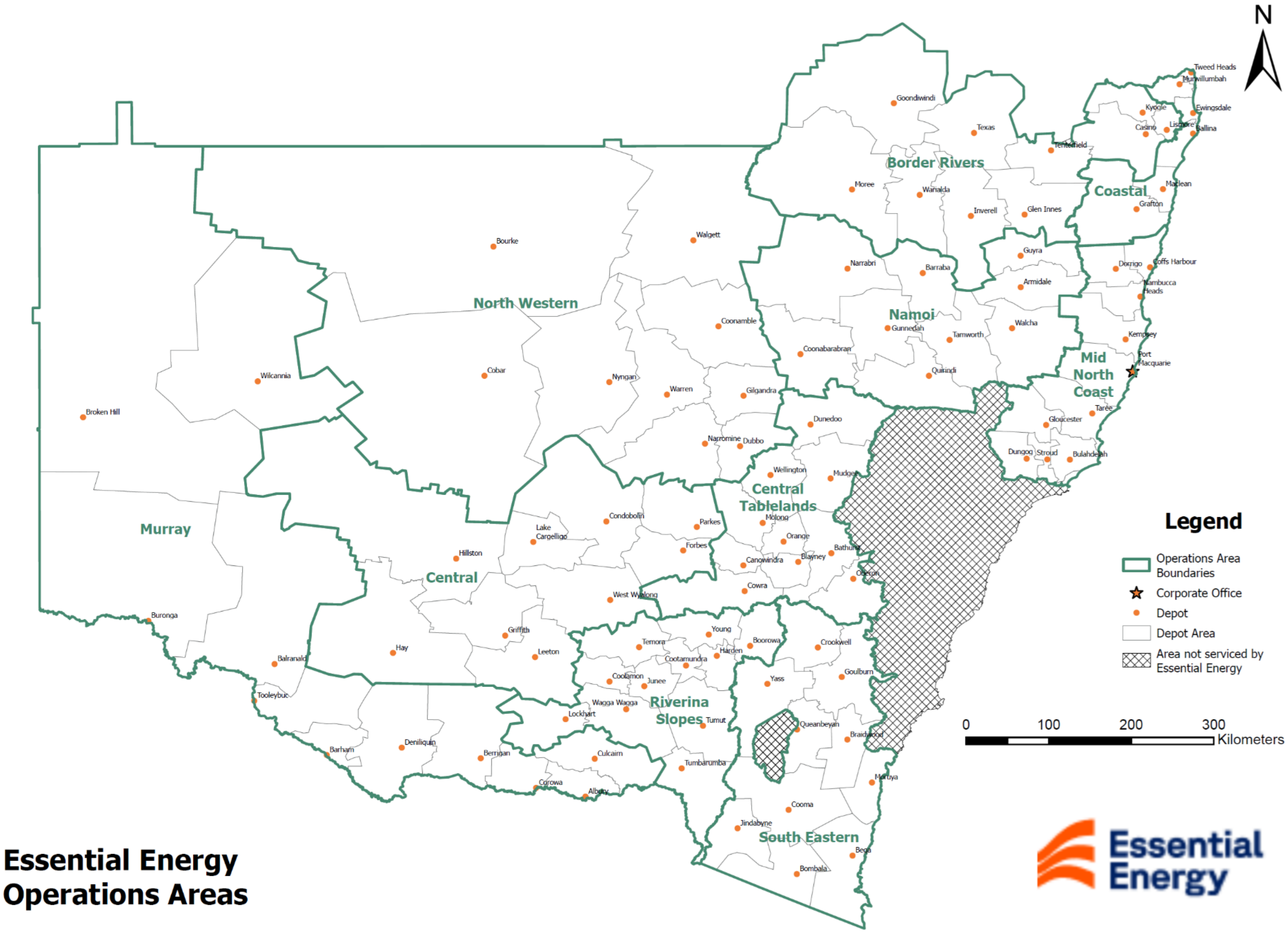


Figure 6: Diagram of Essential Energy's Operational Areas

11. ABBREVIATIONS

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AMP	Asset Management Plan
AMS	Asset Management System
ANS	Ancillary Network Services
AREMI	Australian Renewable Energy Mapping Infrastructure
BESS	Battery Energy Storage System
CAPEX	Capital Expenditure
CVR	Conservation Voltage Reduction
DAPR	Distribution Annual Planning Report
DER	Distributed Energy Resources
DNSP	Distribution Network Service Provider
DOE	Dynamic Operating Envelope
EAM	Enterprise Asset Management
ENSMS	Electricity Network Safety Management System
ERP	Enterprise Resource Planning
FCAS	Frequency Control Ancillary Services
FSA	Formal Safety Assessment
FY	Financial Year
GWh	Gigawatt-Hour
HIRAC	Hazard Identification Risk Assessment and Control
HV	High Voltage (>1000V AC)
ICT	Information and Communication Technology
IN	Intelligent Network
IPART	Independent Pricing and Regulatory Tribunal
ISF	Institute of Sustainable Futures

kV	Kilovolt
LV	Low Voltage (typically 230V/400V)
MEPS	Minimum Energy Performance Standards
MVA	Megavolt-Ampere
MVAr	Megavolt-Ampere-Reactive
MW	Megawatt
MWh	Megawatt-Hour
NECF	National Electricity Customer Framework
NEL	National Electricity Law
NEM	National Electricity Market
NER	National Electricity Rules
OPEX	Operational Expenditure
PV	Photovoltaic (Solar Panels)
RIT-D	Regulatory Investment Test for Distribution
SAMP	Strategic Asset Management Plan
SAPS	Stand Alone Power System
STS	Sub-transmission Substation
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	Supervisory Control and Data Acquisition
SFAIRP	So Far As Is Reasonably Practicable
STPIS	Service Target Performance Incentive Scheme
SWER	Single Wire Earth Return
TNSP	Transmission Network Service Provider
TX	Transformer
VCR	Value of Customer Reliability
WHS	Workplace Health and Safety
ZS	Zone Substation

12. NER CROSS REFERENCE

NATIONAL ELECTRICITY RULES VERSION 236	DAPR 2025 SECTION
SCHEDULE 5.8 DISTRIBUTION ANNUAL PLANNING REPORT FOR THE PURPOSES OF CLAUSE 5.13.2(C), THE FOLLOWING INFORMATION MUST BE INCLUDED IN A DISTRIBUTION ANNUAL PLANNING REPORT:	
(a) information regarding the Distribution Network Service Provider and its network, including:	
(1) a description of its network;	1.1 About Essential Energy
(2) a description of its operating environment;	1.1.1 Operating Environment
	1.1.2 Essential Energy Statistics
(3) the number and types of its distribution assets;	1.2 Essential Energy's Network
	1.2.1 Number and Types of Distribution Assets
(4) methodologies used in preparing the Distribution Annual Planning Report, including methodologies used to identify system limitations and any assumptions applied; and	1.3 Annual Planning Review
	1.3.1 Network Planning Process
(5) analysis and explanation of any aspects of forecasts and information provided in the Distribution Annual Planning Report that have changed significantly from previous forecasts and information provided in the preceding year;	1.4 Significant changes from previous DAPR
	1.4.1 Analysis and explanation of forecast changes
	1.4.2 Analysis and explanation of changes in other information
(b) forecasts for the forward planning period, including at least:	
(1) a description of the forecasting methodology used, sources of input information, and the assumptions applied;	2.1 Load Forecasting Strategy
	2.2 Load Forecasting Methodology and Process
	2.2.1 Sources of load forecasting input information
	2.2.2 Assumptions applied to load forecasts

NATIONAL ELECTRICITY RULES VERSION 236 SCHEDULE 5.8 DISTRIBUTION ANNUAL PLANNING REPORT FOR THE PURPOSES OF CLAUSE 5.13.2(C), THE FOLLOWING INFORMATION MUST BE INCLUDED IN A DISTRIBUTION ANNUAL PLANNING REPORT:	DAPR 2025 SECTION
	2.3 Forecast use of Distribution Services by Distribution Connected Units
(2) load forecasts: (i) at the transmission-distribution connection points; (ii) for sub-transmission lines; and (iii) for zone substations, including, where applicable, for each item specified above: (iv) total capacity; (v) firm delivery capacity for summer periods and winter periods; (vi) peak load (summer or winter and an estimate of the number of hours per year that 95% of peak load is expected to be reached); (vii) power factor at time of peak load; (viii) load transfer capacities; and (ix) generation capacity of known distribution connected units;	Data attachment (DAPR 2025 BSP, ZS and Lines Extract Summary.xlsx)
(2A) forecast use of distribution services by distribution connected units: (i) at the transmission-distribution connection points; (ii) for sub-transmission lions; and (iii) for zone substations, including, where applicable for each item specified above: (iv) total capacity to accept supply from distribution connected units; (v) firm delivery capacity for each period during the year; (vi) peak supply into the distribution network from distribution connected units (at any time during the year) and an estimate of the number of hours per year that 95% of the peak is expected to be reached; and (vii) power factor at time of peak supply into the distribution network;	Data attachment (DAPR 2025 BSP, ZS and Lines Extract Summary.xlsx)
(3) forecasts of future transmission-distribution connection points (and any associated connection assets), sub-transmission lines and zone substations, including for each future transmission-distribution connection point and zone substation: (i) location; (ii) future loading level; and (iii) proposed commissioning time (estimate of month and year);	2.5 Future Proposed Connection Points and Zone Substations
(4) forecasts of the Distribution Network Service Provider's performance against any performance targets in a service target performance incentive scheme; and	2.7 Forecast of Reliability Target Performance

NATIONAL ELECTRICITY RULES VERSION 236 SCHEDULE 5.8 DISTRIBUTION ANNUAL PLANNING REPORT FOR THE PURPOSES OF CLAUSE 5.13.2(C), THE FOLLOWING INFORMATION MUST BE INCLUDED IN A DISTRIBUTION ANNUAL PLANNING REPORT:	DAPR 2025 SECTION
(5) a description of any factors that may have a material impact on its network, including factors affecting; (i) fault levels; (ii) voltage levels; (iii) other power system security requirements; (iv) the quality of supply to other Network Users (where relevant); and (v) ageing and potentially unreliable assets;	Data attachment (DAPR 2025 BSP, ZS and Lines Extract Summary.xlsx)
(b1) for all network asset retirements, and for all network asset de-ratings that would result in a system limitation, that are planned over the forward planning period, the following information in sufficient detail relative to the size or significance of the asset:	
(1) a description of the network asset, including location;	3.4 Network Asset Retirements and De-ratings – Sub-transmission 3.5 Network Asset Retirements and De-ratings – Zone Substation
(2) the reasons, including methodologies and assumptions used by the Distribution Network Service Provider, for deciding that it is necessary or prudent for the network asset to be retired or de-rated, taking into account factors such as the condition of the network asset;	
(3) the date from which the Distribution Network Service Provider proposes that the network asset will be retired or de-rated; and	
(4) if the date to retire or de-rate the network asset has changed since the previous Distribution Annual Planning Report, an explanation of why this has occurred;	
(b2) for the purposes of subparagraph (b1), where two or more network assets are:	
(1) of the same type;	3.5.4 Combined Asset Retirements and De-Ratings
(2) to be retired or de-rated across more than one location;	
(3) to be retired or de-rated in the same calendar year; and	
(4) each expected to have a replacement cost less than $200,000 (as varied by a cost threshold determination), those assets can be reported together by setting out in the Distribution Annual Planning Report:	
(5) a description of the network assets, including a summarised description of their locations;	

NATIONAL ELECTRICITY RULES VERSION 236 SCHEDULE 5.8 DISTRIBUTION ANNUAL PLANNING REPORT FOR THE PURPOSES OF CLAUSE 5.13.2(C), THE FOLLOWING INFORMATION MUST BE INCLUDED IN A DISTRIBUTION ANNUAL PLANNING REPORT:	DAPR 2025 SECTION
(6) the reasons, including methodologies and assumptions used by the Distribution Network Service Provider, for deciding that it is necessary or prudent for the network assets to be retired or de-rated, taking into account factors such as the condition of the network assets;	
(7) the date from which the Distribution Network Service Provider proposes that the network assets will be retired or de-rated; and	
(8) if the calendar year to retire or de-rate the network assets has changed since the previous Distribution Annual Planning Report, an explanation of why this has occurred;	
(c) information on system limitations for sub-transmission lines and zone substations, including at least:	
(1) estimates of the location and timing (month(s) and year) of the system limitation;	3.1 Sub-transmission Feeder Limitations 3.2 Sub-transmission and Zone Substation Limitations
(2) analysis of any potential for load transfer capacity between supply points that may decrease the impact of the system limitation or defer the requirement for investment;	
(3) impact of the system limitation, if any, on the capacity at transmission-distribution connection points;	
(4) a brief discussion of the types of potential solutions that may address the system limitation in the forward planning period, if a solution is required; and	
(5) where an estimated reduction in forecast load or forecast generation from distribution connected units would defer a forecast system limitation for a period of at least 12 months, include: (i) an estimate of the month and year in which a system limitation is forecast to occur as required under subparagraph (1); (ii) the relevant connection points at which the estimated reduction in forecast load may occur; and (iii) the estimated reduction in forecast load or forecast generation in MW or improvements in power factor needed to defer the forecast system limitation;	
(d) for any primary distribution feeders for which a Distribution Network Service Provider has prepared forecasts of maximum demands under clause 5.13.1(d)(1)(iii) and which are currently experiencing an overload, or are forecast to experience an overload in the next two years the Distribution Network Service Provider must set out:	

NATIONAL ELECTRICITY RULES VERSION 236 SCHEDULE 5.8 DISTRIBUTION ANNUAL PLANNING REPORT FOR THE PURPOSES OF CLAUSE 5.13.2(C), THE FOLLOWING INFORMATION MUST BE INCLUDED IN A DISTRIBUTION ANNUAL PLANNING REPORT:	DAPR 2025 SECTION
(1) the location of the primary distribution feeder;	3.3 Primary Distribution Feeder Limitations
(2) the extent to which load exceeds, or is forecast to exceed, 100% (or lower utilisation factor, as appropriate) of the normal cyclic rating under normal conditions (in summer periods or winter periods);	
(3) the types of potential solutions that may address the overload or forecast overload; and	
(4) where an estimated reduction in forecast load would defer a forecast overload for a period of 12 months, include: (i) estimate of the month and year in which the overload is forecast to occur; (ii) a summary of the location of relevant connection points at which the estimated reduction in forecast load would defer the overload; (iii) the estimated reduction in forecast load in MW needed to defer the forecast system limitation;	
(d1) for any primary distribution feeders for which a Distribution Network Service Provider has prepared forecasts of demands for distribution services by distribution connected units under clause 5.13.1(d)(1)(iii) and which are currently experiencing a system limitation, or are forecast to experience a system limitation in the next two years the Distribution Network Service Provider must set out:	
(1) the location of the primary distribution feeder;	3.3 Primary Distribution Feeder Limitations
(2) the extent to which demand for distribution services by distribution connected units exceeds, or is forecast to exceed, 100% (or lower utilisation factor, as appropriate) of the normal capacity to provide those distribution services under normal conditions;	
(3) the types of potential solutions that may address the system limitation or forecast system limitation; and	
(4) where an estimated reduction in demand for distribution services by distribution connected units would defer a forecast system limitation for a period of 12 months, include: (i) estimate of the month and year in which the system limitation is forecast to occur; (ii) a summary of the location of relevant connection points at which the estimated reduction in demand for distribution services by distribution connected units would defer the system limitation;	

NATIONAL ELECTRICITY RULES VERSION 236 SCHEDULE 5.8 DISTRIBUTION ANNUAL PLANNING REPORT FOR THE PURPOSES OF CLAUSE 5.13.2(C), THE FOLLOWING INFORMATION MUST BE INCLUDED IN A DISTRIBUTION ANNUAL PLANNING REPORT:	DAPR 2025 SECTION
(iii) the estimated reduction in demand for distribution services by distribution connected units in MW needed to defer the forecast system limitation;	
(d2) for a SAPS enabled network, information on system limitations in the forward planning period for which a potential solution is a regulated SAPS	
(1) Estimate of the location and timing (months(s) and year) of the system limitation; and	8.5 Non-Network Solutions
(2) A brief discussion of the types of potential stand-alone power systems that may address the system limitation;	
(e) a high-level summary of each RIT-D project for which the regulatory investment test for distribution has been completed in the preceding year or is in progress, including:	
(1) if the regulatory investment test for distribution is in progress, the current stage in the process;	4.1 Regulatory Test / RIT-Ds Completed or in Progress
(2) a brief description of the identified need;	
(3) a list of the credible options assessed or being assessed (to the extent reasonably practicable);	
(4) if the regulatory investment test for distribution has been completed a brief description of the conclusion, including: (i) the net economic benefit of each credible option; (ii) the estimated capital cost of the preferred option; and (iii) the estimated construction timetable and commissioning date (where relevant) of the preferred option; and	
(5) any impacts on Network Users, including any potential material impacts on connection charges and distribution use of system charges that have been estimated;	
(f) for each identified system limitation which a Distribution Network Service Provider has determined will require a regulatory investment test for distribution, provide an estimate of the month and year when the test is expected to commence;	4.2 Potential RIT-Ds for Identified System Limitations
(g) a summary of all committed investments to be carried out within the forward planning period with an estimated capital cost of $2 million or more (as varied by a cost threshold determination) that are to address:	
(1) a refurbishment or replacement need; or	

NATIONAL ELECTRICITY RULES VERSION 236 SCHEDULE 5.8 DISTRIBUTION ANNUAL PLANNING REPORT FOR THE PURPOSES OF CLAUSE 5.13.2(C), THE FOLLOWING INFORMATION MUST BE INCLUDED IN A DISTRIBUTION ANNUAL PLANNING REPORT:	DAPR 2025 SECTION
(2) an urgent and unforeseen network issue as described in clause 5.17.3(a)(1), including:	4.3 Urgent and Unforeseen Investments
(1) a brief description of the investment, including its purpose, its location, the estimated capital cost of the investment and an estimate of the date (month and year) the investment is expected to become operational;	
(2) a brief description of the alternative options considered by the Distribution Network Service Provider in deciding on the preferred investment, including an explanation of the ranking of these options to the committed project. Alternative options could include, but are not limited to, generation options, demand side options, and options involving other distribution or transmission networks;	
(h) the results of any joint planning undertaken with a Transmission Network Service Provider in the preceding year, including:	
(1) a summary of the process and methodology used by the Distribution Network Service Provider and relevant Transmission Network Service Providers to undertake joint planning;	5.1 Results of Joint Planning with the TNSP Transgrid 5.2 Results of Joint Planning with the TNSP Powerlink
(2) a brief description of any investments that have been planned through this process, including the estimated capital costs of the investment and an estimate of the timing (month and year) of the investment; and	
(3) where additional information on the investments may be obtained;	
(i) the results of any joint planning undertaken with other Distribution Network Service Providers in the preceding year, including:	
(1) a summary of the process and methodology used by the Distribution Network Service Providers to undertake joint planning;	5.3 Results of Joint Planning with the DNSP Energex 5.4 Results of Joint Planning with the DNSP Ergon 5.5 Results of Joint Planning with the DNSP Ausgrid 5.6 Results of Joint Planning with the DNSP Endeavour Energy 5.7 Results of Joint Planning with the DNSP Evoenergy 5.8 Results of Joint Planning with the DNSP Powercor Australia
(2) a brief description of any investments that have been planned through this process, including the estimated capital cost of the investment and an estimate of the timing (month and year) of the investment; and	
(3) where additional information on the investments may be obtained;	

NATIONAL ELECTRICITY RULES VERSION 236 SCHEDULE 5.8 DISTRIBUTION ANNUAL PLANNING REPORT FOR THE PURPOSES OF CLAUSE 5.13.2(C), THE FOLLOWING INFORMATION MUST BE INCLUDED IN A DISTRIBUTION ANNUAL PLANNING REPORT:	DAPR 2025 SECTION
(j) information on the performance of the Distribution Network Service Provider's network, including:	
(1) a summary description of reliability measures and standards in applicable regulatory instruments;	6.1 Reliability Performance 6.2 Quality of Supply Performance
(2) a summary description of the quality of supply standards that apply, including the relevant codes, standards and guidelines;	
(3) a summary description of the performance of the distribution network against the measures and standards described under subparagraphs (1) and (2) for the preceding year;	
(4) where the measures and standards described under subparagraphs (1) and (2) were not met in the preceding year, information on the corrective action taken or planned;	
(5) a summary description of the Distribution Network Service Provider's processes to ensure compliance with the measures and standards described under subparagraphs (1) and (2); and	
(6) an outline of the information contained in the Distribution Network Service Provider's most recent submission to the AER under the service target performance incentive scheme;	
(k) information on the Distribution Network Service Provider's asset management approach, including:	
(1) a summary of any asset management strategy employed by the Distribution Network Service Provider;	7.1 Essential Energy's Asset Management Approach 7.2 Network and Asset Strategies
(1A) an explanation of how the Distribution Network Service Provider takes into account the cost of distribution losses when developing and implementing its asset management and investment strategy;	7.3 Treatment of Distribution Losses
(2) a summary of any issues that may impact on the system limitations identified in the Distribution Annual Planning Report that has been identified through carrying out asset management; and	7.4 Asset Issues Impacting Identified System Limitations
(3) information about where further information on the asset management strategy and methodology adopted by the Distribution Network Service Provider may be obtained;	7.5 Obtaining Further Information on the Asset Management Strategy and Methodology
(l) information on the Distribution Network Service Provider's demand management activities, including:	

NATIONAL ELECTRICITY RULES VERSION 236 SCHEDULE 5.8 DISTRIBUTION ANNUAL PLANNING REPORT FOR THE PURPOSES OF CLAUSE 5.13.2(C), THE FOLLOWING INFORMATION MUST BE INCLUDED IN A DISTRIBUTION ANNUAL PLANNING REPORT:	DAPR 2025 SECTION
(1) a qualitative summary of: (i) non-network options that have been considered in the past year, including generation from distribution connected units; (ii) key issues arising from applications to connect distribution connected units received in the past year; (iii) actions taken to promote non-network proposals in the preceding year, including generation from distribution connected units; and (iv) the Distribution Network Service Provider's plans for demand management and generation from distribution connected units over the forward planning period;	8.1 Demand Management Activities in the Preceding Year 8.2 Innovative Demand Management Developments in 2024/25 8.3 Plans for demand management and embedded generation 8.4 Issues arising from applications to connect embedded generation
(2) a quantitative summary of: (i) connection enquiries received under clause 5.3A.5; and of the total, the number for non-registered DER providers; (ii) applications to connect received under clause 5.3A.9; and of the total, the number for non-registered DER providers; and (iii) the average time taken to complete applications to connect;	8.6 Embedded Generation Connection Details
(3) a quantitative summary of: (i) enquiries under clause 5A.D.2 in relation to the connection of micro resource operators or non-registered DER providers; and (ii) applications for a connection service under clause 5A.D.3 in relation to the connection of micro resource operators or non-registered DER providers;	
(m) information on the Distribution Network Service Provider's investments in information technology and communication systems which occurred in the preceding year, and planned investments in information technology and communication systems related to management of network assets in the forward planning period; and	9.1 Information Technology
(n) a regional development plan consisting of a map of the Distribution Network Service Provider's network as a whole, or maps by regions, in accordance with the Distribution Network Service Provider's planning methodology or as required under any regulatory obligation or requirement, identifying:	
(1) sub-transmission lines, zone substations and transmission-distribution connection points; and	Data attachment (DAPR 2025 BSP, ZS and Lines Extract Summary.xlsx)
(2) any system limitations that have been forecast to occur in the forward planning period, including, where they have been identified, overloaded primary distribution feeders.	3.1 Sub-transmission Feeder Limitations 3.2 Sub-transmission and Zone Substation Limitations 3.3 Primary Distribution Feeder Limitations

NATIONAL ELECTRICITY RULES VERSION 236 SCHEDULE 5.8 DISTRIBUTION ANNUAL PLANNING REPORT FOR THE PURPOSES OF CLAUSE 5.13.2(C), THE FOLLOWING INFORMATION MUST BE INCLUDED IN A DISTRIBUTION ANNUAL PLANNING REPORT:	DAPR 2025 SECTION
	10 REGIONAL DEVELOPMENT PLANS https://dapr.essentialenergy.com.au/
(o) the analysis of the known and potential interactions between:	
(1) any emergency frequency control schemes, or emergency controls in place under clause S5.1.8, on its network; and	6.3 Frequency Control and Protection Systems
(2) protection systems or control systems of plant connected to its network (including consideration of whether the settings of those systems are fit for purpose for the future operation of its network), undertaken under clause 5.13.1(d)(6), including a description of proposed actions to be undertaken to address any adverse interactions	
(p) for a SAPS enable network, information on the Distribution Network Service Provider's activities in relation to DNSP-led SAPS projects including:	
(1) Opportunities to develop DNSP-led SAPS projects that have been considered in the past year;	8.5.1 Standalone Power Systems (SAPS)
(2) Committed projects to implement a regulated SAPS over the forward planning period; and	
(3) A quantitative summary of: (i) The total number of regulated SAPS in the network; and (ii) The total number of premises of retail customer supplied by means of those regulated SAPS	
(q) the system strength locational factor for each system strength connection point for which it is the Network Service Provider and the corresponding system strength node.	6.4 System Strength Locational Factors

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