Regulatory Investment Test for Distribution

Addressing Reliability Requirements in the Chinchilla Network Area

Final Project Assessment Report

This document describes the *identified need* for investment at Chinchilla substation and the preferred option for addressing the identified need.

Publication date: 25 February 2021

Executive Summary

ABOUT ERGON ENERGY

Ergon Energy Corporation Limited (Ergon Energy) is part of Energy Queensland and manages an electricity distribution network which supplies electricity to more than 765,000 customers. Our vast operating area covers over one million square kilometres – around 97% of the state of Queensland – from the expanding coastal and rural population centres to the remote communities of outback Queensland and the Torres Strait.

Our electricity network consists of approximately 160,000 kilometres of powerlines and one million power poles, along with associated infrastructure such as major substations and power transformers.

We also own and operate 33 stand-alone power stations that provide supply to isolated communities across Queensland which are not connected to the main electricity grid.

IDENTIFED NEED

Chinchilla 132/110/33kV Substation (CHIN) is located in the township of Chinchilla in south-west Queensland. The substation is a joint site with Powerlink Queensland, with Powerlink Queensland owning the 132kV switchyard.

CHIN supplies the 33kV sub-transmission network in Chinchilla and the surrounding area. CHIN provides electricity supply to approximately 6,500 customers, of which 82% are residential and 18% are commercial, agricultural and industrial. CHIN is presently supplied via two incoming 132kV feeders from H018 Tarong Substation, and there are two outgoing 132kV feeders to T194 Columboola Substation.

The 33kV bus at CHIN is supplied by two transformer bays. The primary supply is from a single 132/33/11kV 63MVA transformer, and the back-up supply is provided by a 132/110kV 30MVA transformer that supplies a 110/33kV 20MVA transformer and a 33kV 20MVA voltage regulator.

A substation condition assessment report (SCAR) has identified primary and secondary plant and equipment in poor condition and / or near end of useful life.

The SCAR identified that the 132/110kV transformer is in poor condition due to high levels of acetylene and acidity. The 110/33kV transformer, 33kV CTs, 110kV CTs and 30 protection relays are near end of useful life. The deterioration of these primary and secondary plant poses significant safety risks to staff working within the switchyard, and reliability risk to the customers supplied from CHIN.

APPROACH

The National Electricity Rules (NER) require that, subject to certain exclusion criteria, network business investments for meeting service standards for a distribution business are subject to a Regulatory Investment Test for Distribution (RIT-D). Ergon Energy has determined that network investment is essential in this case for it to continue to provide electricity to the consumers in the Chinchilla supply area in a reliable, safe and cost-effective manner. Accordingly, this investment is subject to a RIT-D.

Ergon Energy published a Notice of no non-network options for the above-mentioned identified needs on 30 October 2020.

The following credible feasible option has been identified and investigated in this report. The costs are indicative estimates at the time when a feasible option was being determined. There will be further stages to the following option in the future as mandated by the recommended replacement of assets.

1. **Option 1** – Remove all 110kV assets, install a 2nd 132/33kV transformer and a 33kV bus-tie circuit breaker ($7.89M)

This is now a Final Project Assessment Report, where Ergon Energy presents the technical and financial analysis of the above options and identifies the preferred solution in accordance with the requirements of clause 5.17.4(o) of the NER. Ergon Energy's preferred solution to address the identified need is Option 1 – Remove 110kV assets, install a 132/33kV transformer and a 33kV bus-tie circuit breaker.

Table of Contents

List of Figures and Tables

1. Introduction

This FPAR has been prepared by Ergon Energy in accordance with the requirements of clause 5.17.4(o) of the National Electricity Rules (NER).

This report represents the final stage of the consultation process in relation to the application of the Regulatory Investment Test for Distribution (RIT-D) on potential credible options to address the identified need for CHIN.

In preparing this RIT-D, Ergon Energy is required to consider reasonable future scenarios. With respect to major customer loads and generation, Ergon Energy has, in good faith, included as much detail as possible while maintaining necessary customer confidentiality. Potential large future connections that Ergon Energy is aware of are in different stages of progress and are subject to change (including outcomes where none or all proceed). These and other customer activity can occur over the consultation period and may change the timing and/or scope of any proposed solutions.

1.1. Structure of the report

This report:

- Provides background information of the capability limitations of the distribution network supplying the Chinchilla area.
- Identifies the need which Ergon Energy is seeking to address, together with the assumptions used in identifying and quantifying that need.
- Describes the credible option that Ergon Energy currently considers may address the identified need, including:
  - Its technical definitions;
  - The estimated commissioning date; and
  - The total indicative cost (including capital and operating costs)
- Quantifies costs and classes of material market benefits for the credible option.
- In case of multiple options, this report provides the results of a comparative Net Present Value (NPV) analysis and accompanying explanatory statements regarding the results.

1.2. Dispute resolution process

In accordance with the provisions set out in clause 5.17.5(a) of the NER, Registered Participants or Interested Parties may, within 30 days after the publication of this report, dispute the conclusions made by Ergon Energy with the Australian Energy Regulator. Accordingly, Registered Participants and Interested Parties who wish to dispute the conclusions outlined in this report based on a manifest error in the calculations or application of the RIT-D must do so within 30 days of the publication date of this report. Any parties raising a dispute are also required to notify Ergon Energy. Dispute notifications should be sent to demandmanagement@ergon.com.au

If no formal dispute is raised, Ergon Energy will proceed with the preferred internal option.

1.3. Contact details

Inquiries about this RIT-D may be sent to:

E: demandmanagement@ergon.com.au

P: 13 74 66

2. Background

2.1. Geographic Region

T013 Chinchilla 132/110/33kV Substation (CHIN) is in the township of Chinchilla in south-west Queensland. The substation supplies the 33kV sub-transmission network in Chinchilla and the surrounding area. Outside of Chinchilla, the supply area is primarily rural. CHIN provides electricity supply to approximately 6,500 customers, of which 82% are residential and 18% are commercial, agricultural and industrial.

The geographical location of Ergon Energy's sub-transmission network and substations in the area is shown in Figure 1.

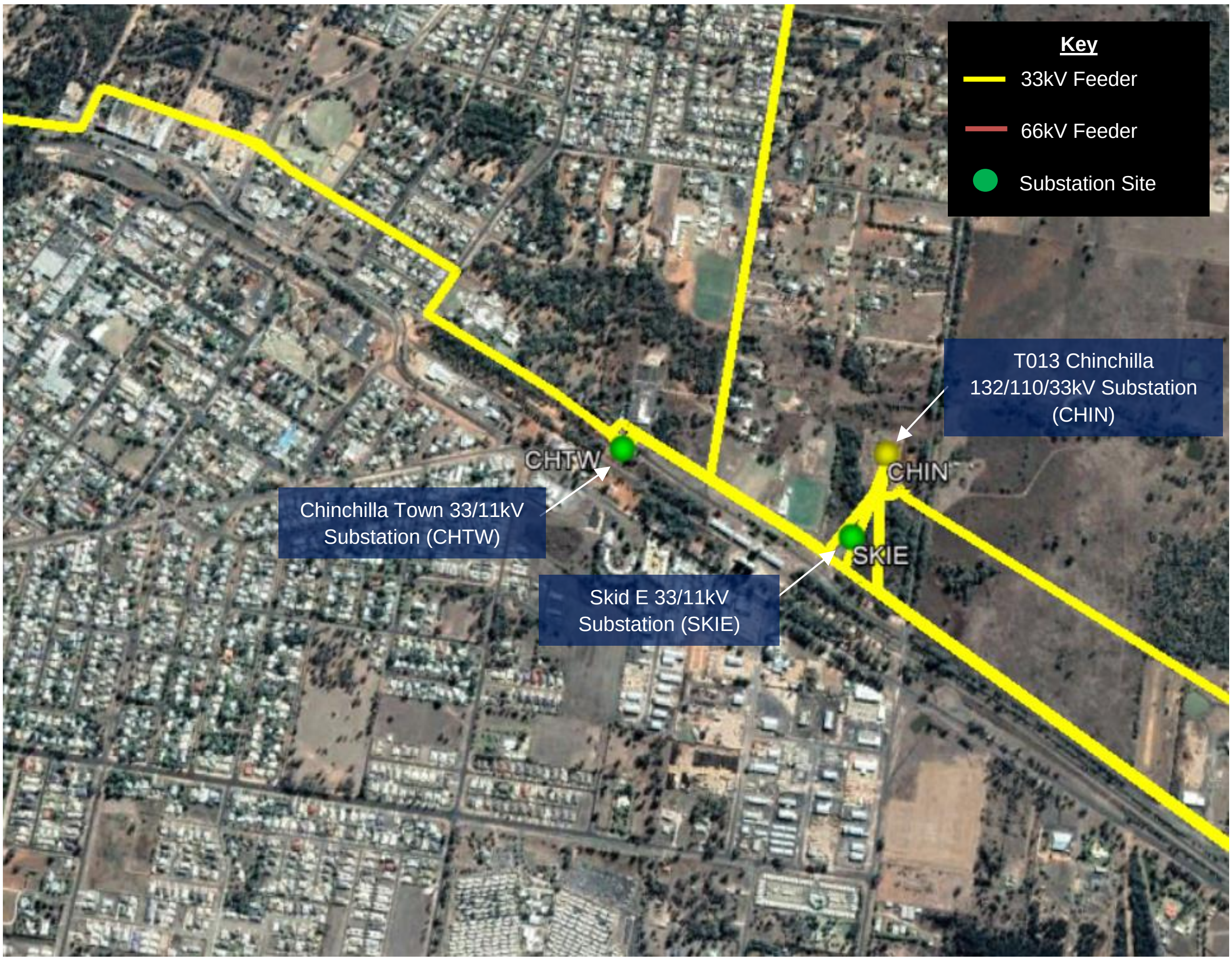


Figure 1: Existing network arrangement (geographic view)

2.2. Existing Supply System

CHIN is a joint site with Powerlink Queensland, where Powerlink Queensland owns the 132kV switchyard. The substation is presently supplied via two incoming 132kV feeders from H018 Tarong Substation, and there are two outgoing 132kV feeders from CHIN to T194 Columboola Substation.

CHIN was established in 1956 according to the applicable design and construction standards during that time. The 33kV bus at CHIN is supplied by two transformer bays. Under system normal conditions, the 33kV bus is supplied by a single 132/33/11kV 50/63MVA ONAN/ONAF transformer (T3).

Back-up supply is provided by a 132/110kV 30MVA transformer (T4) that supplies a 110/33kV 20MVA transformer (T2) and a 33kV 20MVA voltage regulator (R2). These assets are kept energised but unloaded and are operated as a hot spare in the case of the loss of the 132/33kV transformer.

The 33kV bus does not contain a bus tie circuit breaker; however, there are two sets of manually operated 33kV bus isolators. This arrangement impacts adversely on customer reliability.

CHIN supplies four 33kV feeders; the Chinchilla Town feeder, Kogan feeder, Brigalow feeder and Fairymeadow feeder. The Chinchilla Town 33kV feeder supplies the Chinchilla Town 33/11kV Substation (CHTW) and the Chinchilla Skid E 33/11kV Substation (SKIE). CHTW has two outgoing 11kV feeders which supply the township and there is also one additional 11kV feeder that is supplied from the SKIE.

A schematic view of the existing sub-transmission network arrangement is shown in Figure 2 and the geographic view of CHIN is illustrated in Figure 3.

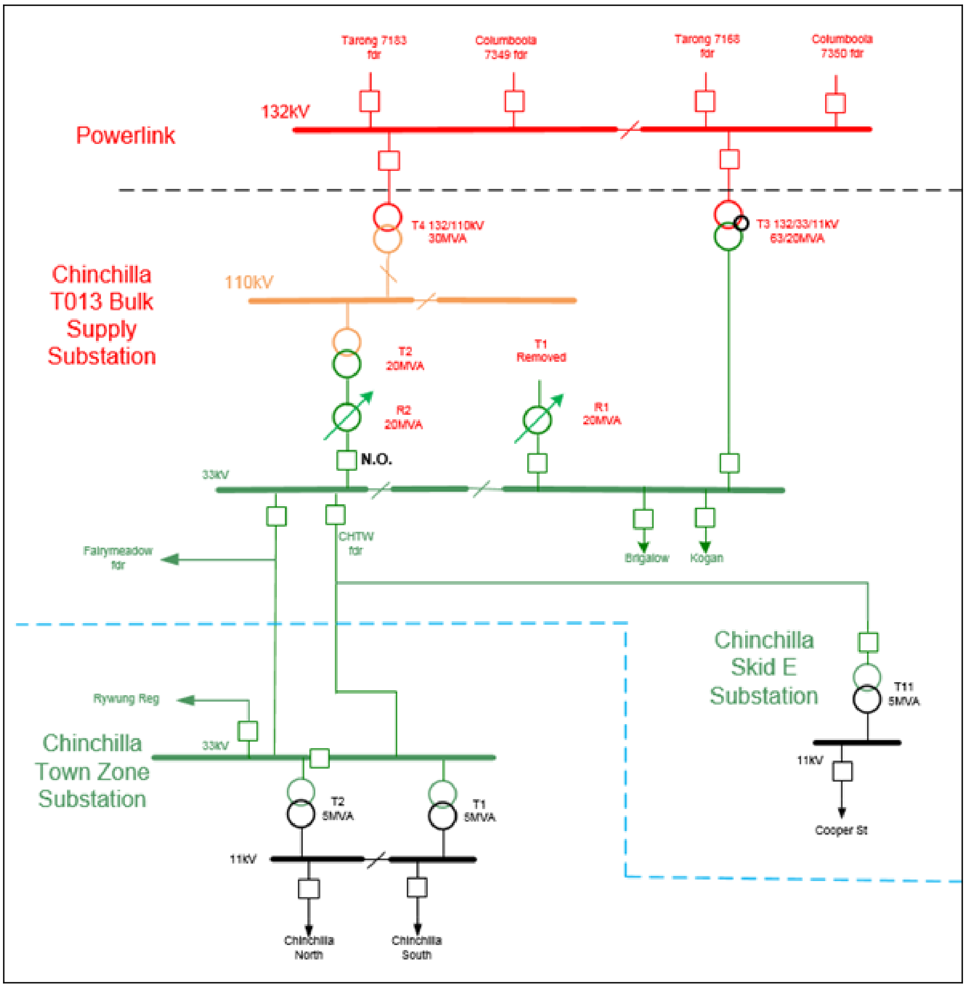


Figure 2: Existing network arrangement (schematic view)

Figure 3: Chinchilla Substation (geographic view)

2.3. Load Profiles / Forecasts

The load at CHIN comprises a mix of residential and commercial/industrial customers. The load is summer peaking, and the annual peak loads are predominantly driven by pumping and irrigation.

2.3.1. Full Annual Load Profile

The full annual load profile for CHIN over the 2019/20 financial year is shown in Figure 4. It can be noted that the peak load occurs during summer.

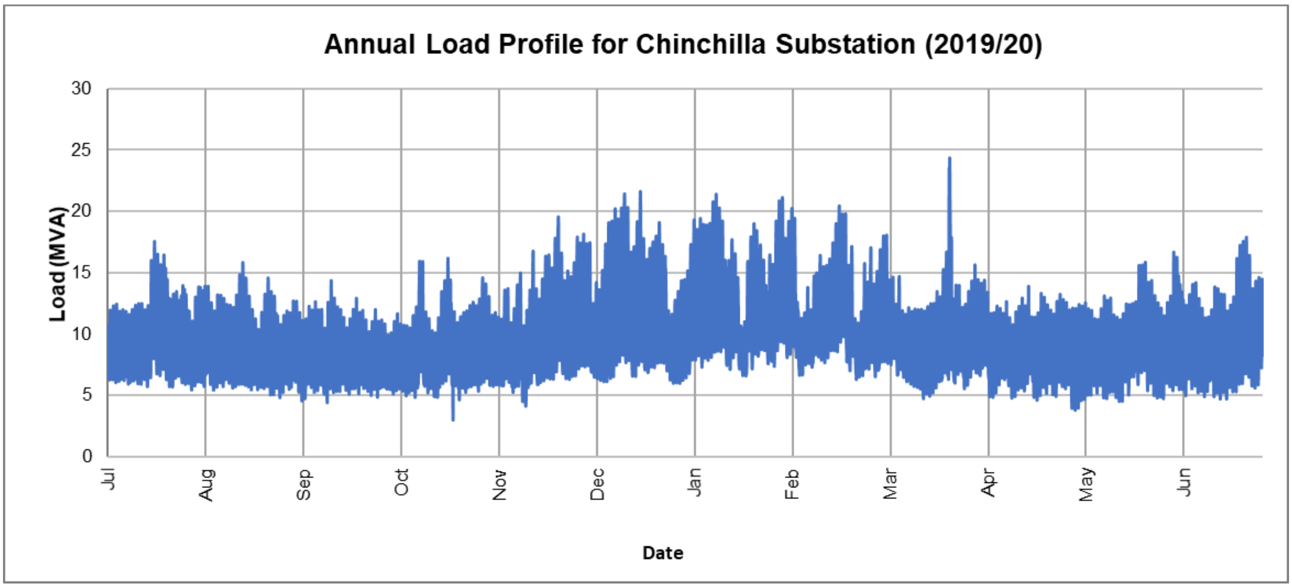


Figure 4: CHIN actual annual load profile

2.3.2. Load Duration Curve

The load duration curve for Chinchilla Substation over the 2019/20 financial year is shown in Figure 5.

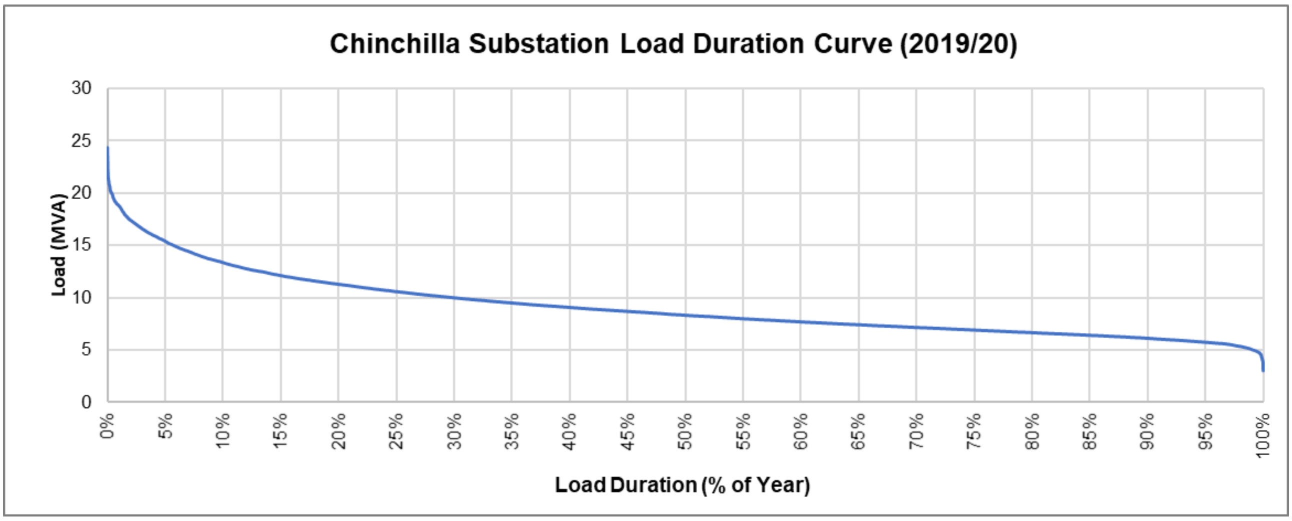


Figure 5: CHIN load duration curve

2.3.3. Average Peak Weekday Load Profile (Summer)

The daily load profile for an average peak weekday during summer is illustrated below in Figure 6. It can be noted that the summer peak loads at CHIN are historically experienced in the late afternoon and evening.

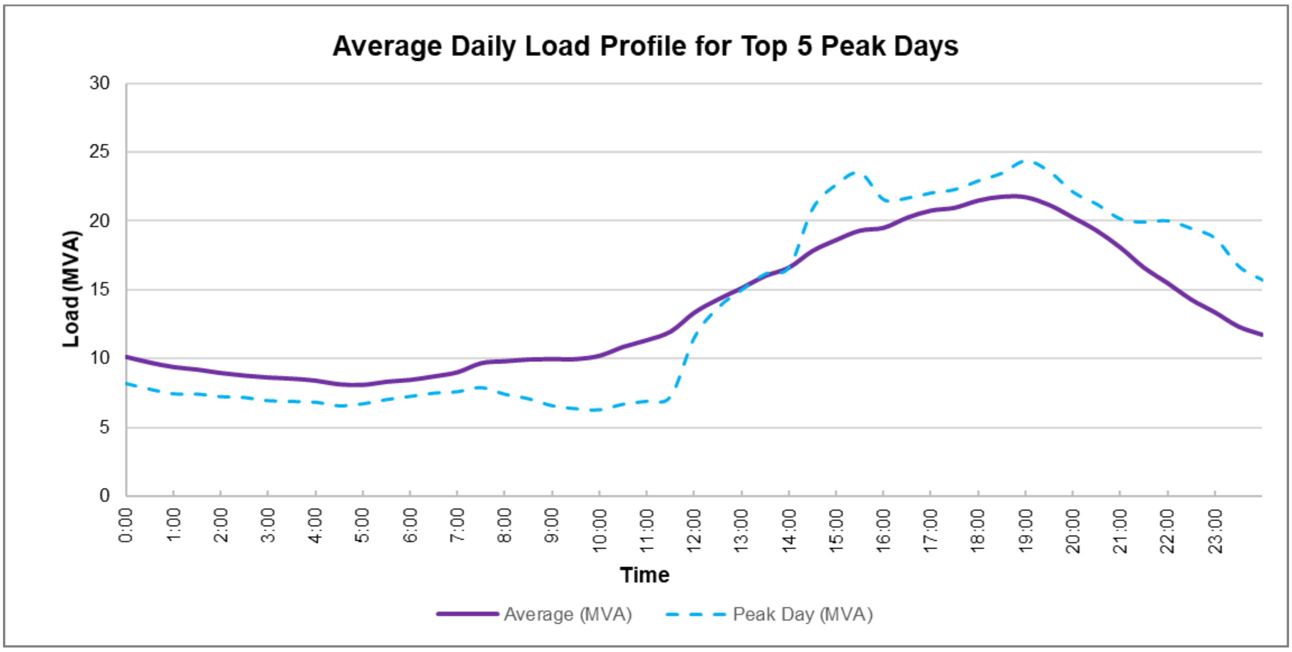


Figure 6: CHIN average peak weekday load profile (summer)

2.3.4. Base Case Load Forecast

The 10 PoE and 50 PoE load forecasts for the base case load growth scenario are illustrated in Figure 7. The historical peak load for the past six years has also been included in the graph.

It can be noted that the historical annual peak loads have fluctuated over the past five years, primarily due to seasonal variation in pumping and irrigation load due to the quantity and timing of rainfall in the area. It can also be noted that the peak load is forecast to increase slightly over the next 10 years under the base case scenario.

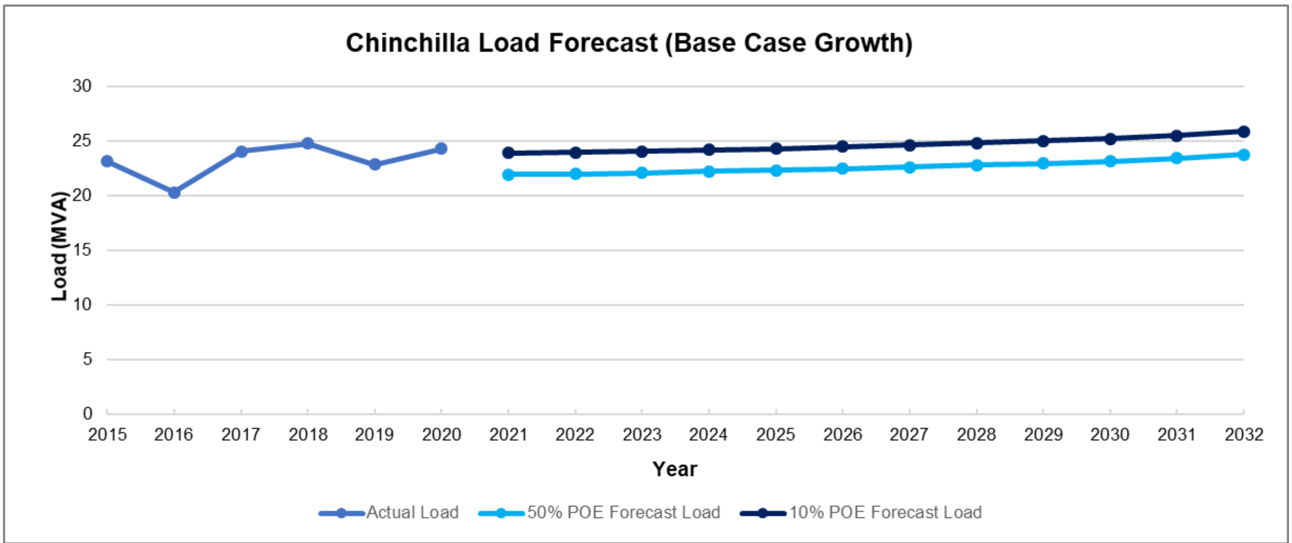


Figure 7: CHIN base case load forecast

2.3.5. High Growth Load Forecast

The 10 PoE and 50 PoE load forecasts for the high load growth scenario are illustrated in Figure 8. With the high growth scenario, the peak load is forecast to increase over the next 10 years.

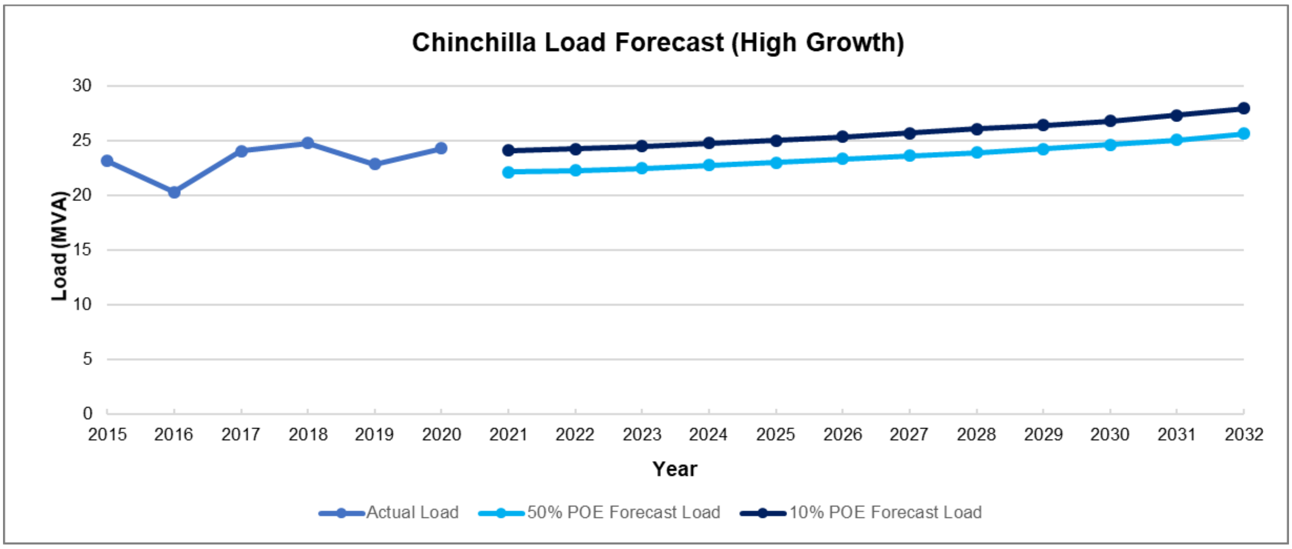


Figure 8: CHIN high growth load forecast

2.3.6. Low Growth Load Forecast

The 10 PoE and 50 PoE load forecasts for the low load growth scenario are illustrated in Figure 9. With the low growth scenario, the peak load is forecast to remain steady over the next 10 years.

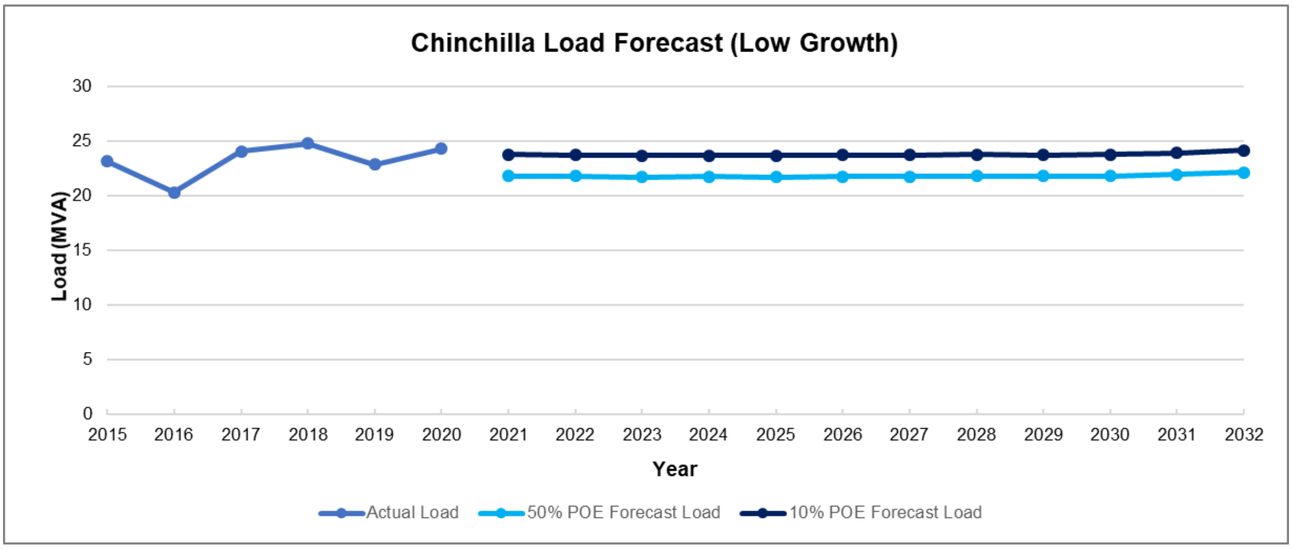


Figure 9: CHIN low growth load forecast

3. Identified Need

3.1. Description of the Identified Need

3.1.1. Aged and Poor Condition Assets

A recent condition assessment has highlighted that several critical assets are near end of useful life and are in poor condition. The condition of these assets presents a significant safety, environmental and reliability risk.

Condition data indicates that the 132/110kV transformer is in poor condition with high levels of acetylene and acidity. The 110/33kV transformer, 33kV voltage regulator, five 33kV CTs, three 110kV CTs, seven 33kV VTs, 110kV VTs and 30 protection relays are near end of their useful life.

The deterioration of these primary and secondary system assets poses significant safety risks to staff working within the switchyard. It poses a safety risk to the general public through the increased likelihood of protection relay mal-operation and catastrophic failure of the power transformers. There is a significant risk of environmental harm due to leakage of oil from the power transformers, which would require clean up and rectification. Additionally, the poor condition of these assets significantly increases the likelihood of outages, resulting in a reduction in the level of reliability experienced by the customers supplied from CHIN.

3.1.2. Reliability

There is presently no bus tie circuit breaker on the 33kV bus at CHIN. Under the existing sub-transmission network configuration most faults that occur within CHIN will result in an outage to all the customers supplied from Chinchilla. This affects almost 6,500 customers and results in a combined peak load at risk of approximately 24MVA.

The network arrangement contributed to higher than average System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) for the distribution feeders than is generally expected for a short rural network.

SAIDI means the sum of the durations of all the sustained interruptions (in minutes), divided by the customer base. Momentary interruptions (of three minutes or less) are excluded from the calculation of unplanned SAIDI.

SAIFI means the total number of sustained interruptions, divided by the customer base. Momentary interruptions (of three minutes or less) are excluded from the calculation of unplanned SAIFI.

The three year average network performance for the distribution feeders supplied from CHIN, CHTW and SKIE substations is shown in Table 1.

Feeder	Category	Feeder 3 year average SAIDI	Category SAIDI target	Feeder 3 year average SAIFI	Category SAIFI target
Chinchilla North	Short Rural	200	424	2.65	3.95
Chinchilla South	Short Rural	288	424	4.42	3.95
Cooper Street	Short Rural	204	424	3.58	3.95
Kogan	Short Rural	1111	424	5.37	3.95
Brigalow	Long Rural	707	964	5.64	7.40
Fairymeadow	Short Rural	794	424	5.16	3.95

Table 1: Feeder reliability category and performance (existing network)

Feeder reliability classifications are defined below:

- green feeders have a three-year average ≤ target
- yellow feeders have a three-year average > target < 150% target
- amber feeders have a three-year average > 150% target < 200% target
- red feeders have a three-year average > 200% target.

3.1.3. Safety Net Non-compliance

CHIN is categorised as a *Rural Area* under Ergon Energy's Distribution Authority No. D01/99.

Under a credible contingency event involving a 33kV bus fault at CHIN benchmarked against 50% POE load, Ergon Energy will not be able to meet Safety Net restoration times as the assessed time required to isolate the faulted section of the bus and perform manual switching to restore supply to the remaining section of bus is more than one hour.

This is not within the one-hour period required under the Safety Net criteria and is reflected in the figure below.

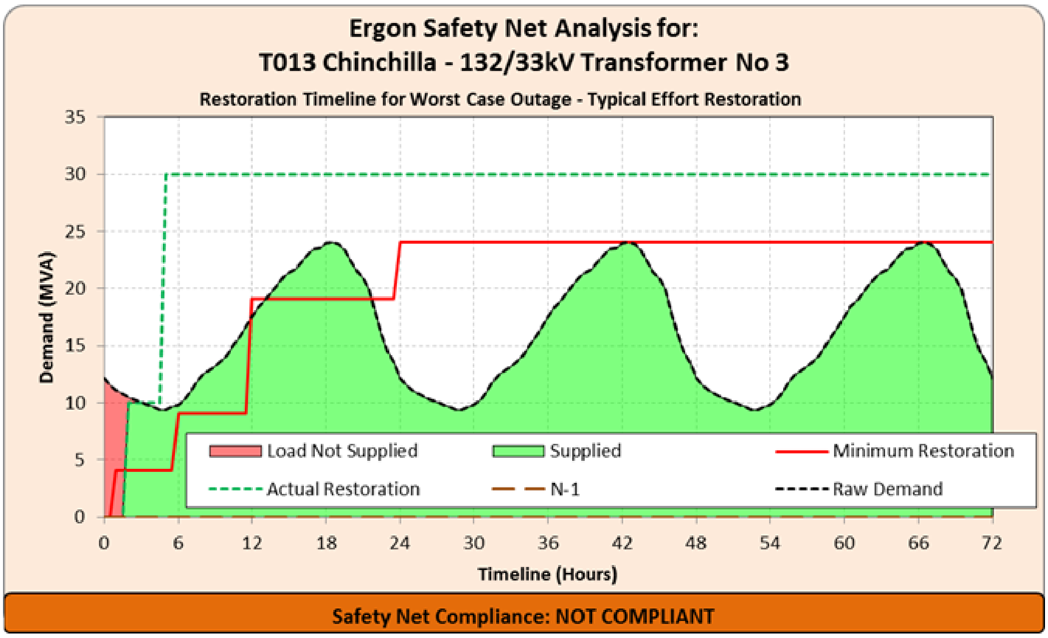


Figure 10: Safety Net analysis for Chinchilla (loss of a 33kV bus section)

3.2. Quantification of the Identified Need

- **Ageing plant**

The primary objective of this investment is to address the risk to the network, plant and personnel from operating such plant which is at the end of its lifecycle (lifecycle of an asset being the year of its manufacture, operational conditions and its condition assessment towards the recommended end of useful life).

- **Reliability**

The second objective is to improve the reliability of supply in the Chinchilla area and to reduce the higher than average current SAIDI and SAIFI figures.

- **Legislative requirement**

The third objective is to comply with the legislative framework for the Safety Net targets issued to Ergon Energy consistent with Clause 10 of the Distribution Authority.

- **Safety Net non-compliant**

Finally, the last objective of this investment is to address the Safety Net non-compliance.

3.3. Assumptions in relation to the Identified Need

Below is a summary of key assumptions that have been made when the identified need has been analysed and quantified. It is recognised that the below assumptions may prove to have various levels of correctness, and they merely represent a 'best endeavours' approach to predict the future identified need.

- **Load Profile**

Characteristic peak day load profiles shown in Section 2.3 are unlikely to change significantly from year to year, i.e. the shape of the load profile will remain virtually the same with increasing maximum demand.

- **Forecast Maximum Demand**

It has been assumed that peak demand at CHIN will grow as per the base case load forecast.

Factors that have been considered when the demand forecast has been developed include the following:

- load history
- known future developments (new major customers, network augmentation, etc.)
- temperature corrected start values (historical peak demands)
- forecast growth rates for organic growth

- **System Capability – Transformer capacity**

Transformer ratings are normally specified by a continuous rating, supplied by the manufacturer on the nameplate. This corresponds to the load that will cause the oil and winding temperature rise to meet the specified limit, assuming a constant temperature and a constant rated load.

Cyclic ratings in excess of nameplate ratings are possible because the typical load cycle is not continuous, nor is the daily temperature cycle. Each transformer also has a typical thermal time constant of a few hours. All these factors are combined to enable cyclic loading of a transformer in excess of the nameplate rating before the temperature limits are reached.

Each transformer has two cyclic ratings for both summer and winter, based on the load profile and the ambient temperature for that transformer location.

- **System Capability – Transfer Capacity**

In times of contingency, for example when one transformer is faulty, load may be transferred to another substation via the distribution network. The distribution network transfer capability is largely determined by the capacity of the powerlines to carry the transferred load as well as their ability to maintain system voltages.

4. No Non-Network Alternatives

Ergon Energy has determined there is no non-network alternative that would be technically viable to address the network risk associated with the poor condition of the existing assets, i.e. assets near end of useful life and Safety Net non-compliance.

The following non–network solutions have been assessed for either deferring or replacing the network investment required in the Chinchilla supply area:

- Demand Management (Demand Reduction) such as power factor correction, energy efficiency, load control.
- Demand Response through customer embedded generation, call off load and load curtailment contracts.

The above have been assessed as not technically viable as they will not address the network risk associated with poor condition of the assets.

5. Internal Option Identified

Ergon Energy's preferred internal network option is to remove the existing 110kV assets i.e., the transformers, regulator, circuit breakers, busbar and isolators. It will include the installation one new 132/33kV transformer with compliant bunding. The project will also involve the installation of a 33kV bus tie circuit breaker, secondary systems upgrades and the condition-based replacement of 33kV VTs and CTs in order to address the identified need.

A schematic diagram of the proposed network arrangement for the internal option is shown in Figure 11.

Upon completion of these works, the asset safety and reliability risks at CHIN will be addressed. The preferred option will provide the greatest reliability benefit for customers, whilst also reducing expenditure on obsolete and non-compliant assets while ensuring more efficient use of design and construction resources.

The estimated capital cost of this option inclusive of interest, risk, contingencies and overheads is $7.89 million. Annual operating and maintenance costs are anticipated to be 0.5% of the capital cost. The estimated project delivery timeframe has design commencing in mid-2022 and construction completed by May 2026.

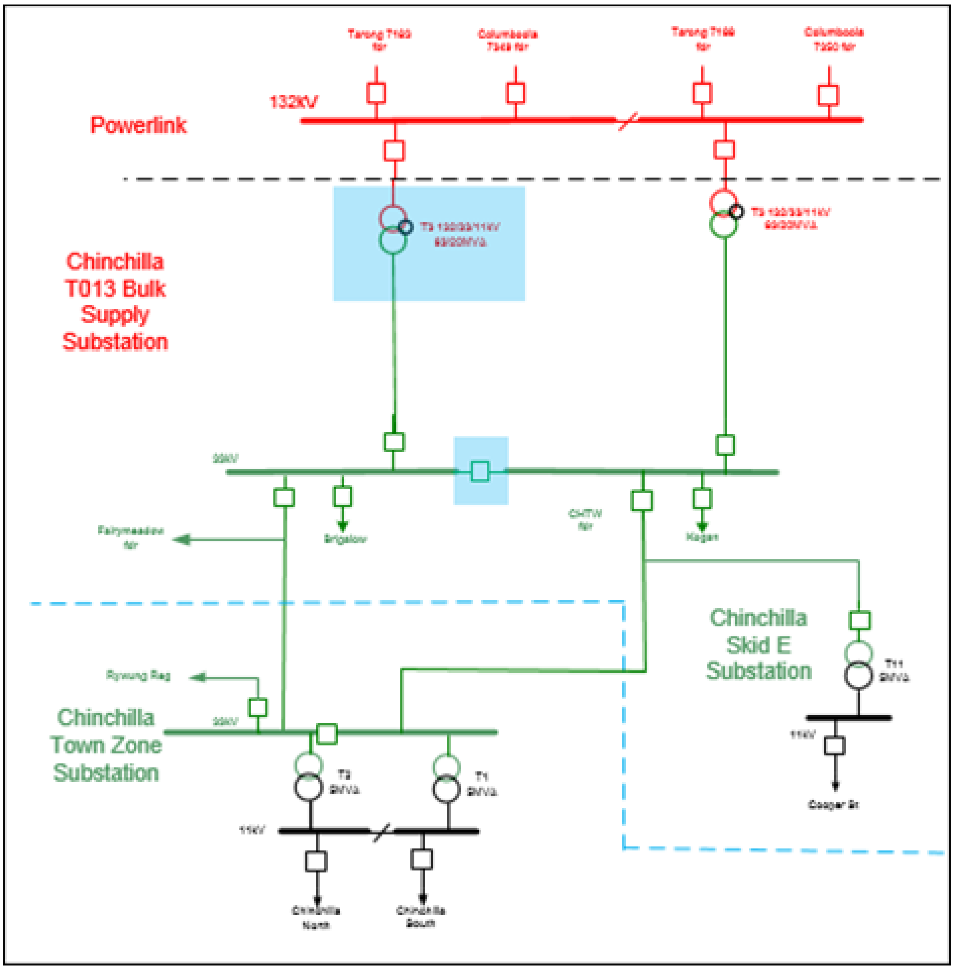


Figure 11: Proposed network arrangement (schematic view)

5.1. Scope of the Preferred Internal Option

The following works are proposed to be carried out as part of the preferred network solution at CHIN:

- Deconstruct recover/scrap the 110kV assets including T1/R1, T2/R2, CBs, bus and switchgear.
- Install second 132/33kV transformer suitably matched to T3.
- Utilise existing 33kV and 132kV CBs to connect to new 132/33kV transformer.
- Install 33kV bus section circuit breaker.
- Swap 33kV Chinchilla Town FDR F083C and Brigalow FDR F069C feeder bays. Alternate configurations may be considered for ideal reliability outcomes.
- Remove obsolete 110kV & 33kV protection devices and replace/consolidate 33kV protection devices.
- Replace all aged/conditioned 33kV CTs and VTs.
- All removed CT & VT assets need to be assessed and placed back in store for spares if deemed to be in a suitable condition.

5.2. Financial Analysis

A net present value (NPV) analysis was not carried out as there is only one internal option identified. The estimated capital cost of this option inclusive of interest, risk, contingencies and overheads is $7.89 million. Annual operating and maintenance costs are anticipated to be 0.5% of the capital cost.

6. Market Benefits

The purpose of the RIT-D is to identify the option that maximises the present value of net market benefits to all those who produce, consume and transport electricity in the National Electricity Market (NEM). Consistent with NER clause 5.17.1(c)(4), Ergon Energy has considered the following classes of market benefits:

- Changes in voluntary load curtailment;
- Changes in involuntary load shedding and customer interruptions caused by network outages using a reasonable forecast of the value of electricity to customers;
- Changes in costs for parties other than the RIT-D proponent due to differences in the timing of new plant, capital costs, and operating and maintenance costs;
- Differences in the timing of expenditure;
- Changes in load transfer capacity and the capacity of embedded generators to take up load;
- Any additional option value (where this value has not already been included in the other classes of market benefits) gained or foregone from implementing the credible option with respect to the likely future investment needs of the NEM;
- Changes in electrical energy losses.

6.1 Changes in Voluntary Load Curtailment

The option considered in this RIT-D does not include any voluntary load curtailment. There are no customers on such arrangements in the Chinchilla area at the moment. Any market benefits associated with changes in voluntary load curtailment have been considered but not included.

6.2 Changes in Involuntary Load Shedding

A reduction in involuntary load shedding is expected from the credible option presented in this report. The fact is that the aged substation assets present an area wide level of risk to the supply network. The benefits from changes in involuntary load shedding have not been included in this report because they are not so significant as to impact the financial decision-making.

6.3 Changes in costs to Other Parties

Ergon Energy does not anticipate that the credible option included in this RIT-D assessment will affect costs incurred by other parties.

6.4 Differences in Timing of Expenditure

The credible option included in this RIT-D assessment is not expected to affect the timing of other distribution investments for unrelated identified needs.

6.5 Changes in Load Transfer Capacity

The credible option identified in this RIT-D assessment is not expected to affect the load transfer capacity in the Chinchilla area.

6.6 Option Value

The AER's view is that option value is likely to arise where there is uncertainty regarding future outcomes, the information that is available in the future is likely to change, and the credible options considered by the RIT-D proponent are sufficiently flexible to respond to that change.

Ergon Energy does not consider that the identified need for the option included in this RIT-D would be affected by uncertain factors about which there may be more clarity in the future.

6.7 Changes in Network Losses

Ergon Energy does not anticipate that the credible option included in the RIT-D assessment will lead to any significant change in network losses.

7. Conclusion

This Final Project Assessment Report represents the final stage of the RIT-D process to address the identified need at CHIN.

Ergon Energy intends to take steps to progress the recommended solution to ensure any statutory non-compliance is addressed and undertake appropriately justified network reliability improvements as necessary.

7.1 Preferred Option

Ergon Energy's preferred internal solution is to remove the existing 110kV assets including the transformers, regulator, circuit breakers, bus and isolators, and installing one new 132/33kV transformer with compliant bunding. The project will also involve the installation of a 33kV bus tie circuit breaker, secondary systems upgrades and the condition-based replacement of 33kV VTs and CTs in order to address the identified need.

7.2 Satisfaction of the RIT-D

The proposed preferred option satisfies the RIT-D. This statement is made on the basis of the detailed analysis set out in this report. The proposed option is the only credible option that has been identified.

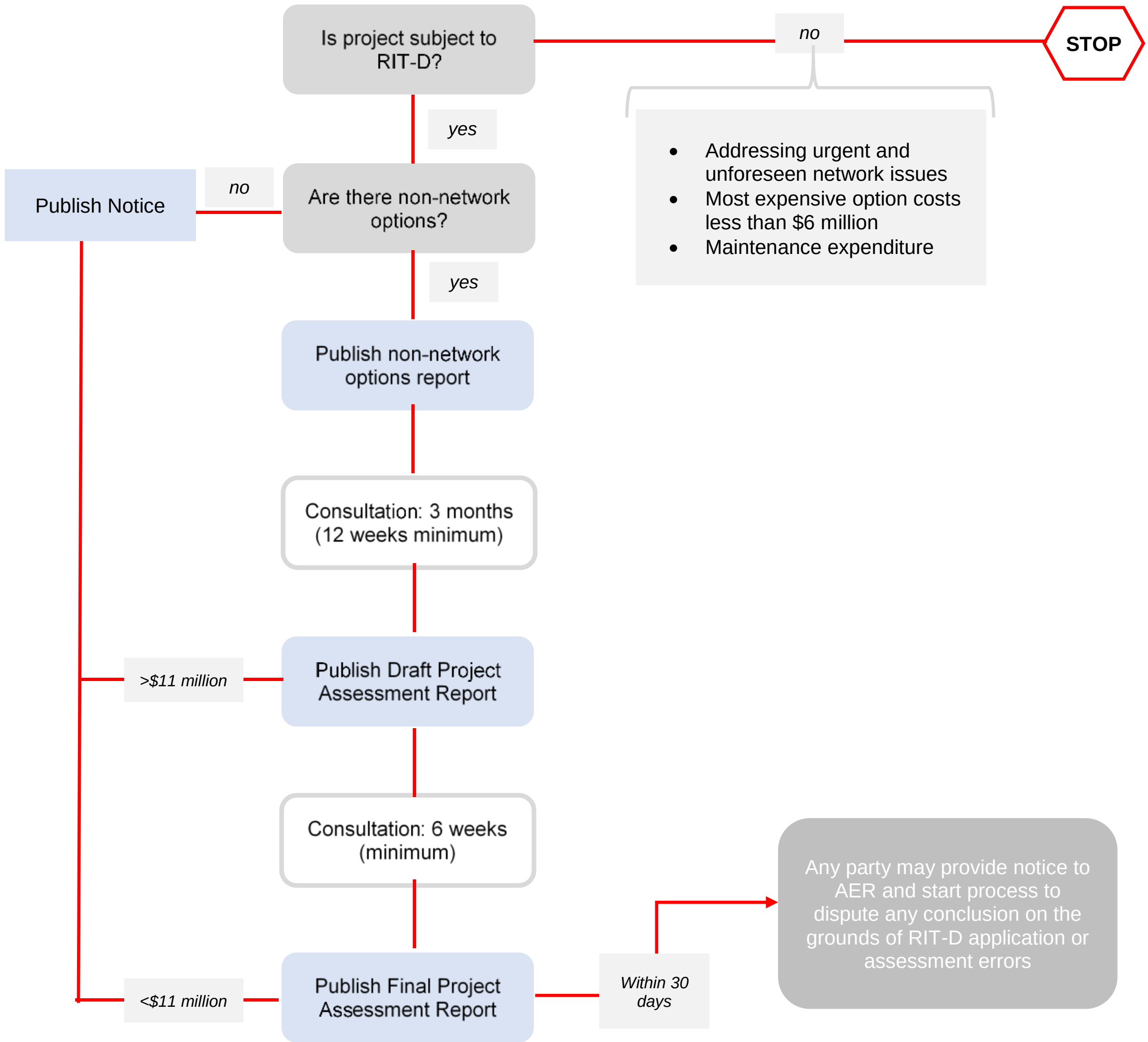
8. Compliance Statement

This Final Project Assessment Report complies with the requirements of NER section 5.17.4(j) as demonstrated below:

Requirement	Report Section
(1) a description of the identified need for investment;	3
(2) the assumptions used in identifying the identified need (including, in the case of proposed reliability corrective action, why the RIT-D proponent considers reliability corrective action is necessary);	3.3
(3) if applicable, a summary of, and commentary on, the submissions received on the NNOR;	NA
(4) a description of each credible option assessed	NA
(5) where a *Distribution Network Service Provider* has quantified market benefits in accordance with clause 5.17.1(d), a quantification of each applicable market benefit of each credible option	NA
(6) a quantification of each applicable cost for each credible option, including a breakdown of operating and capital expenditure	5, 5.2
(7) a detailed description of the methodologies used in quantifying each class of costs or market benefit	NA
(8) where relevant, the reasons why the RIT-D proponent has determined that a class or classes of market benefits or costs do not apply to a credible option	6
(9) the results of an NPV analysis of each credible option and accompanying explanatory statements regarding the results	5.2
(10) the identification of the proposed preferred option	5, 7.1
(11) or the proposed preferred option, the RIT-D proponent must provide: (i) details of the technical characteristics; (ii) the estimated construction timetable and commissioning date (where relevant); (iii) the indicative capital and operating costs (where relevant); (iv) a statement and accompanying analysis that the proposed preferred option satisfied the RIT-D; and (v) if the proposed preferred option is for reliability corrective option and that the option has a proponent, the name of the proponent	5
(12) contact details for a suitably qualified staff member of the RIT-D proponent to whom queries on the draft report may be directed.	1.3

9. Appendices

9.1 The RIT-D Process



Source: AEMC, *Rule determination: National Electricity Amendment (Replacement expenditure planning arrangements) Rule 2017*, July 2017, p. 64.

9.2 Glossary of Terms

Abbreviation	Description
ACP	Approved Cost Plan
ALARP	As Low as Reasonably Practicable
ASEA	Allmänna Svenska Elektriska Aktiebolaget (or General Swedish Electrical Limited Company)
CB	Circuit Breaker
CBRM	Condition Based Risk Management
CHIN	T013 Chinchilla 132/110/33kV Substation
CT	Current transformer
DGA	Dissolved Gas Analysis
ECC	Emergency cyclic capacity
kV	kilovolts
MVA	Megavolt-ampere
N-1 ECC	Capacity available when the largest transformer fails
NCC	Normal cyclic capacity
NEF	Neutral earth fault
NER	National Electricity Rules
ONAF	Oil natural air forced
ONAN	Oil natural air natural
POE	Probability of exceedance
ppm	Parts per million
REF	Restrictive earth fault
RIT-D	Regulatory Investment Test for Distribution
SCAR	Substation Condition Assessment Report
SEF	Sensitive earth fault
VT	Voltage transformer
YOM	Year of manufacture
ZS	Zone Substation (or simply substation)

9.3 Ergon Energy's Minimum Service

The legislated System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) limits from Ergon Energy's Distribution Authority are detailed in **Table 2**.

Table 2: SAIDI (minutes per customer) and SAIFI (interruptions per customer) limits.

Feeder Category	SAIDI MSS Limit	SAIFI MSS Limit
Urban	149	1.98
Short Rural	424	3.95
Long Rural	964	7.40

The legislated Safety Net Targets from Ergon Energy's Distribution Authority are provided in **Table 3**. Chinchilla is classified a 'Rural Area'.

Table 3: Ergon Energy Safety Net Targets

Area	**Targets (for restoration of supply following an N-1 Event)**
Regional Centre	Following an N-1 event, load not supplied must be: o Less than 20 MVA after 1 hour; o Less than 15 MVA after 6 hours; o Less than 5 MVA after 12 hours; and o Fully restored within 24 hours.
Rural Areas	Following an N-1 event, load not supplied must be: o Less than 20 MVA after 1 hour; o Less than 15 MVA after 8 hours; o Less than 5 MVA after 18 hours; and o Fully restored within 48 hours.
Note: All modelling and analysis will be benchmarked against 50 POE loads and based on credible contingencies. 'Regional Centre' relates to larger centres with predominantly urban feeders. 'Rural Areas' relates to areas that are not Regional Centres.	