Regulatory Investment Test for Distribution (RIT-D)

Connection of a Large Load Customer in the Greenvale Network Area

Notice of No Non-Network Options

10 July 2023

ERGON ENERGY NETWORK

Part of Energy Queensland

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.

Identified Need

Ergon Energy has received a connection application for a major customer to connect to the network in the Greenvale region with a requirement for a large supply. The connection arrangement, which has been agreed by, in consultation with the customer, is for a dedicated connection which is composed of both Alternate Control Services (ACS) and Standard Control Services (SCS) as defined in Chapter 10 of the National Electricity Rules (NER).

Works classified as ACS requires that customer fund the cost directly. SCS works are those that are central to the supply of electricity and provided by Ergon Energy, including design, construction and operation of the shared network. Cost for these services is recovered through network charges for all relevant customers.

This RIT-D only considers the SCS component, as this is network expenditure, under the identified need. It should also be noted that included within the SCS component is a portion of cost attributed to Powerlink Queensland, as pass-through costs, and as such is covered under joint planning for the region. For transparency purposes this cost has been included in this report.

With the connection of a dedicated large load connection in the Greenvale region Ergon Energy has a requirement to upgrade the communication path in the area to enable duplicate three terminal line differential protection. As a requirement of the NER (refer to Schedule 5.1; Schedule 5.3; S5.1.9(d); S5.3.3(d)) to establish protection systems with redundancy, the communication path is required to be dual and diverse. The completion date for the works is October 2025, which is driven by the customer timeframes for connection.

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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 Greenvale supply area in a reliable, safe and cost-effective manner. Accordingly, this investment is subject to a RIT-D. An internal assessment has been conducted and it has been determined that there is no non-network option that is potentially credible, or that forms a significant part of a potential credible option that will meet the identified need or form a significant part of the solution. This Notice has hence been prepared by Ergon Energy in accordance with the requirements of clause 5.17.4(d) of the NER.

CONTENTS

1. BACKGROUND

1.1. Geographic Region

Greenvale is situated approximately 250km west of Townsville. There is an existing 66/11kV substation which supplies customers in the Greenvale area. A major customer has requested electrical connection within the area, shown in the blue are in Figure 1. (Note: To ensure commercial in confidence the exact location of the customer has not been depicted). The existing Greenvale substation is not suitable sized or equipped to facilitate the connection. Currently, there are two major feeders in the area, 132kV Ross-Kidston line (7158) and the 66kV Ingham to Greenvale line (IN-GR-A), as shown in Figure 1. A planning report was developed in consultation with the customer with numerous options presented, with connection to the 132kV network being the preferred solution.

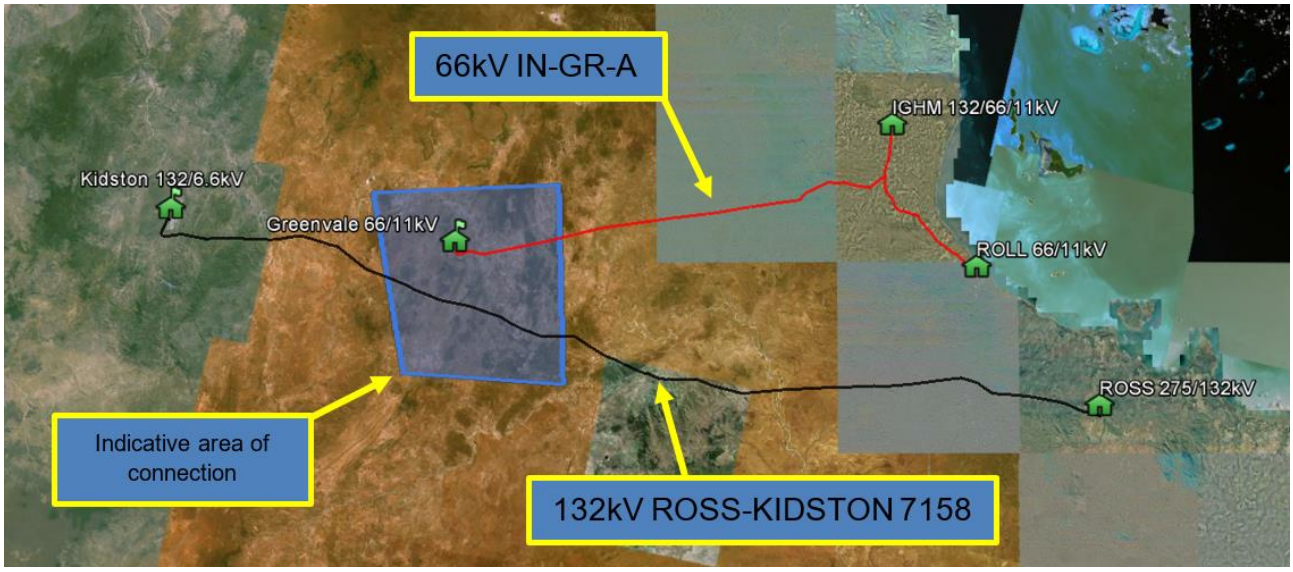


Figure 1: Existing network arrangement (geographic view)

1.2. Supply System

The connection will be off the existing 7158 132kV Ross-Kidston feeder. A schematic view of the sub-transmission network arrangement is shown in Figure 2. There is currently no dual and diverse communication network in the area, which is a requirement to ensure adequate protection with any single protection element out of service (refer to NER Schedule 5.1; Schedule 5.3; S5.1.9(d); S5.3.3(d)).

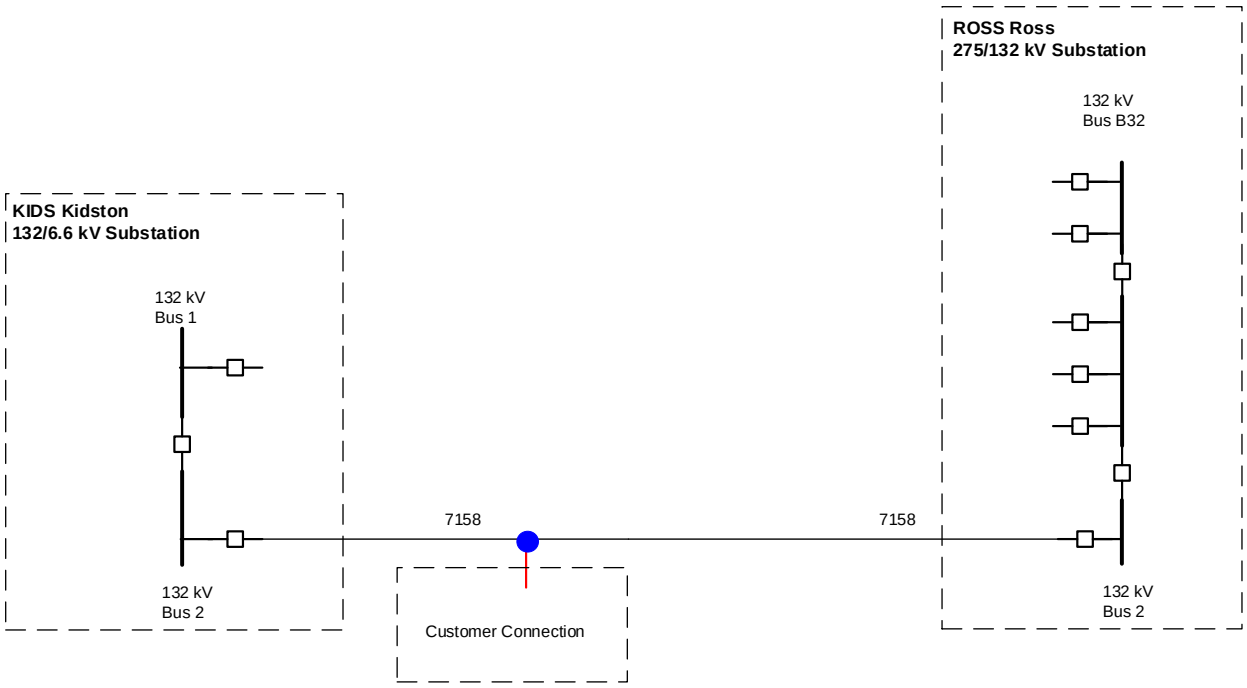


Figure 2: Network arrangement (schematic view)

1.3. Load Profiles / Forecasts

The load for the customer connection is commercial in confidence, along with the load profiles and load duration.

The only impact to shared network is the ability to continue to supply Kidston substation from the existing Ross-Kidston 7158 feeder. The total load under the Low, Base and High case load forecast for Kidston, plus the connection load does not exceed the line rating of 7158 feeder. The Kidston forecast and line rating is shown in Table 1.

Table 1 Load Forecast on the 132kV 7158 Feeder

Year	Kidston 132/6.6kV **Low Load** Forecast (MVA)		Kidston 132/6.6kV **Base Load** Forecast (MVA)		Kidston 132/6.6kV **High Load** Forecast (MVA)		7158 Thermal Line Rating (MVA)
	10POE	50POE	10POE	50POE	10POE	50POE	
2024	5.87	5.32	5.93	5.38	5.99	5.44	85.4
2025	5.80	5.27	5.88	5.34	6.00	5.45	85.4
2026	1.20	0.67	1.40	0.86	1.57	1.01	85.4
2027	1.17	0.65	1.41	0.87	1.63	1.06	85.4
2028	1.18	0.65	1.46	0.92	1.72	1.15	85.4
2029	1.16	0.63	1.46	0.91	1.80	1.22	85.4
2030	1.11	0.59	1.50	0.95	1.89	1.30	85.4
2031	1.11	0.59	1.55	0.99	1.97	1.38	85.4
2032	1.09	0.57	1.59	1.03	2.06	1.46	85.4
2033	1.07	0.55	1.61	1.05	2.16	1.54	85.4
2034	1.08	0.57	1.66	1.10	2.30	1.67	85.4

2. IDENTIFIED NEED

2.1. Description of the Identified Need

As part of a major load connection in the Greenvale area a project has been initiated which includes both ACS and SCS cost components. This RIT-D covers the identified need pertaining to the SCS component of the cost.

2.1.1. Protection and Communication Requirement

As depicted in Figure 2 the load connection will be teed off the existing Ross- Kidston 132kV line. While most costs are ACS there is an SCS component for a dual and duplicate communication path to provide adequate protection, as outlined in the NER (refer to Schedule 5.1; Schedule 5.3; S5.1.9(d); S5.3.3(d)), of the shared network. Currently there is insufficient protection grade communication system in the Greenvale area and as such these need to be established before the customer can connect to the network.

3. INTERNAL OPTIONS CONSIDERED

3.1. Non-Network Options Identified

Ergon Energy has not identified any viable non-network solutions internally that will provide a complete or a hybrid (combined network and non-network) solution to provide the magnitude of network support required in the Greenvale area to address the identified need.

3.2. Network Options Identified

Ergon Energy has identified one credible network options that will address the identified need.

3.2.1. Option A: New Communication Feeder Network

This option involves, constructing a 17km overhead fibre optic communication line, terminating the fibre cable into a pole mounted connectorized box adjacent to the new 132kV Powerlink feeder and constructing a dual and diverse overhead fibre optic communication line between KIDS substation and a new Powerlink Substation to address the identified need.

A schematic diagram of the proposed communication network arrangement for Option A is shown in Figure 3.

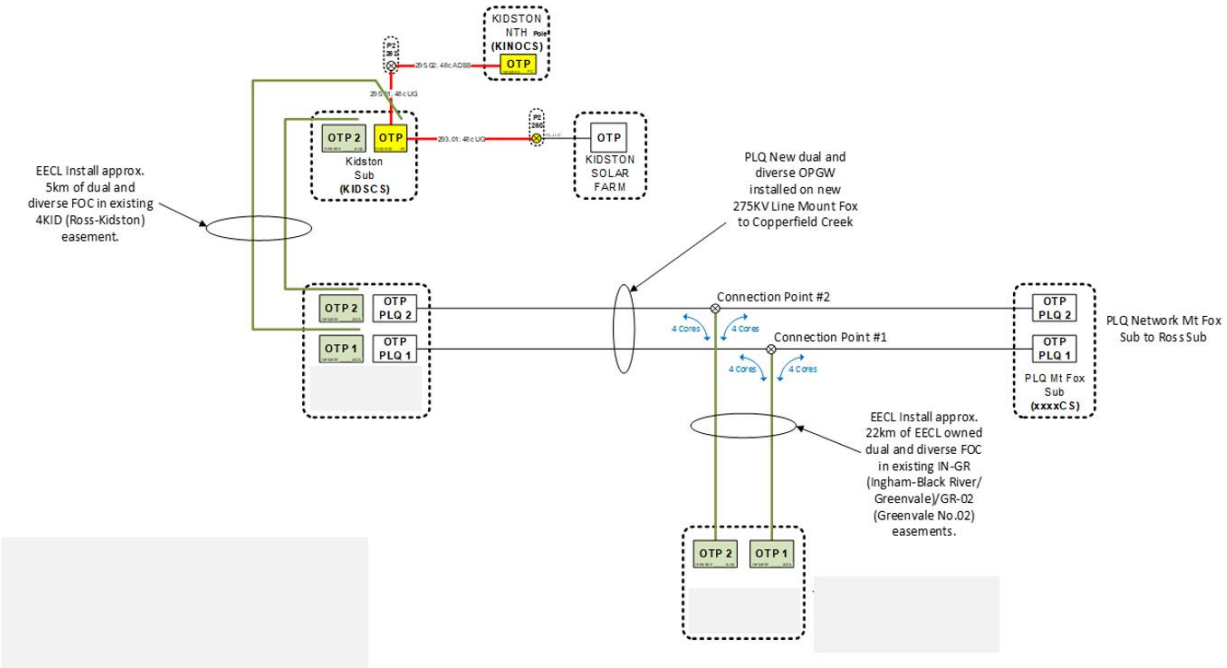


Figure 3: Option A proposed communication network arrangement (schematic view)

3.3. Preferred Network Option

Ergon Energy's preferred internal network option is Option A, to install a new overhead optic fibre communication network.

Upon completion of these works, the NER requirements for protection systems will be addressed and the customer enable to connect to the Ergon Network. The preferred option will provide the greatest reliability and benefit for customers.

The total estimated capital cost of this option inclusive of interest, risk, contingencies and overheads is $9.085 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 end of 2023 and construction completed by October 2025.

4. ASSSESSMENT OF NON-NETWORK SOLUTIONS

This project is associated with Ergon Energy's communication network to abide with the legislative requirements of the NER (refer to Schedule 5.1; Schedule 5.3; S5.1.9(d); S5.3.3(d)). No alternative to the Option presented has been deemed as a potential non-network alternative.

Ergon Energy's Demand & Energy Management (DEM) team has assessed the potential non-network alternative (NNA) options required to defer the network option and determine there is no viable demand management (DM) option to replace or reduce the need for the network options proposed, as the entire major load would need to be supplied from an alternate source.

Credible options must be technically and commercially viable and must be able to be implemented in sufficient time to satisfy the identified need.

4.1. Demand Management (Demand Reduction)

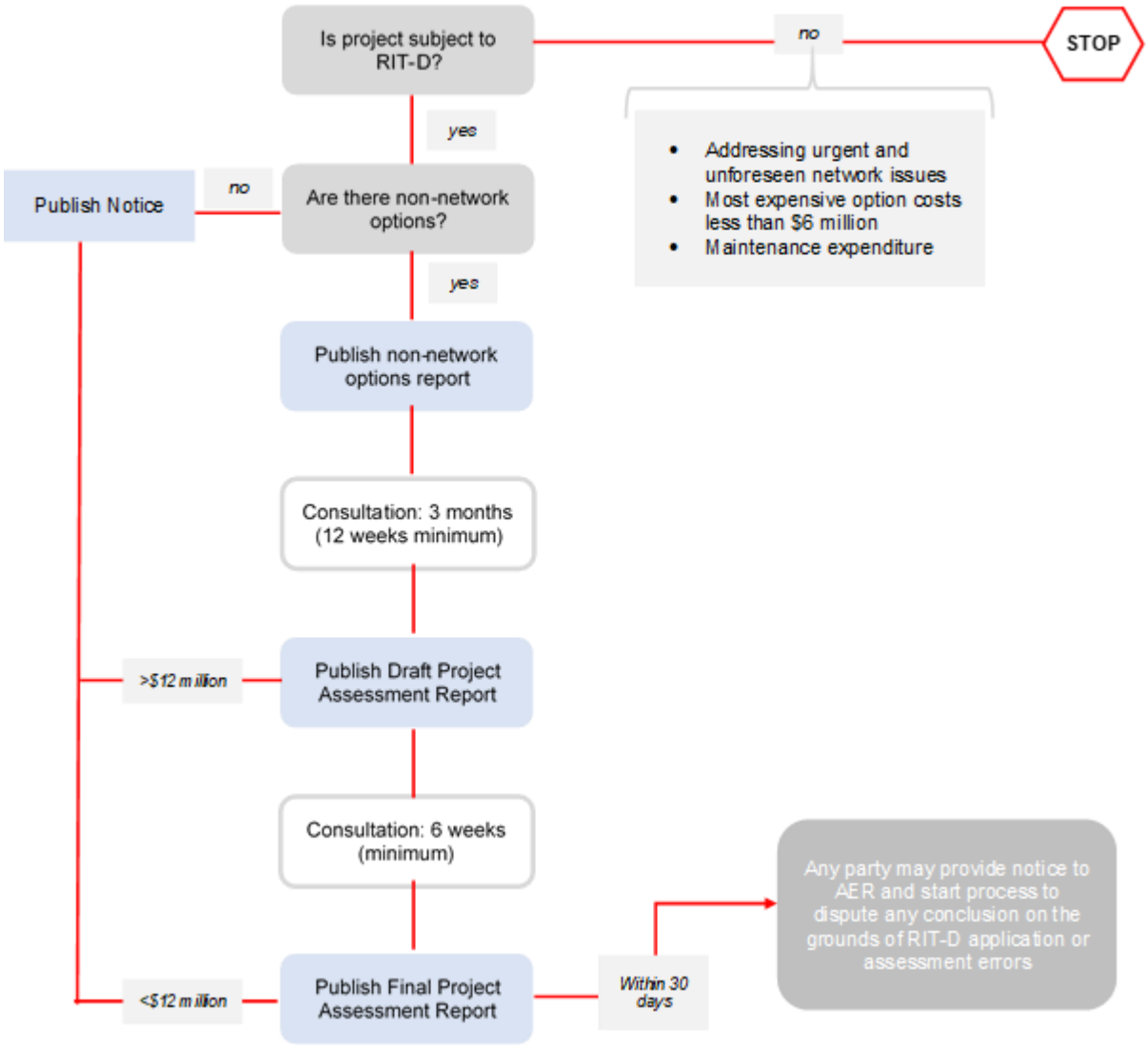
In this instance demand reduction is not a viable alternative to a network connection for the major customer and large load. As such no further investigation into demand reduction solutions was pursued.

5. CONCLUSION AND NEXT STEPS

The internal investigations undertaken on the feasibility of the non-network solutions revealed that it is unlikely to find a complete non-network solution or a hybrid (combined network and non-network) solution to provide the magnitude of network communication support required to meet the requirements of the NER with regard to protection grade communication and redundant systems in the Greenvale area to address the identified need.

The preferred network option is Option A – New Communication Feeder Network. This Notice of No Non-Network Options is therefore published in accordance with rule 5.17.4(d) of the National Electricity Rules. As the next step in the RIT-D process, Ergon Energy will now proceed to publish a Final Project Assessment Report.

APPENDIX A – THE RIT-D PROCESS



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