Worst Performing Feeder Program

Business Case

22 January 2024

ERGON ENERGY NETWORK
Part of Energy Queensland

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DOCUMENT VERSION

Version Number	Change Detail	Date
1	Submission version of document.	21/12/2023

RELATED DOCUMENTS

The following documents are referenced in Energy Queensland's regulatory submission to the AER:

Document Date	Document Name	Document Type
03/10/2019	Distribution Authority No. D01/99, Ergon Energy	PDF
31/12/2018	Distribution Annual Planning Report 2018, Ergon Energy	PDF
22/12/2022	Distribution Annual Planning Report 2022, Ergon Energy	PDF
2022	Queensland Household Energy Survey 2022	PDF

1 SUMMARY

<table>
<tr><th>Title</th><th>Worst Performing Feeder Improvement Program</th></tr>
<tr><td>DNSP</td><td>Ergon Energy</td></tr>
<tr><td>Expenditure category</td><td>☐ Replacement ☒ Augmentation ☐ Connections ☐ Tools and Equipment
☐ ICT ☐ Property ☐ Fleet</td></tr>
<tr><td>Identified need</td><td>☒ Legislation ☒ Regulatory compliance
☒ Reliability ☐ CECV ☐ Safety ☐ Environment ☐ Financial
The Distribution Authority (DA) No. D01/99 Clause 11 ‘Improvement Programs’ requires that Ergon Energy implement a program to improve reliability on the worst performing distribution feeders.</td></tr>
<tr><td>Summary of preferred option</td><td>Option 1 is the delivery of the Worst Performing Feeder (WPF) improvement program to fulfil the Clause 11 requirement in the DA.
The WPF improvement program will be a five-year work program with a primary focus to improve the experience of the customers who are supplied by the consistently worst performing distribution feeders or feeder sections. The improvement program is targeted at the worst 5% of the network’s distribution feeders, based on three-year average SAIDI/SAIFI performance, where the SAIDI/SAIFI outcome is 200% or more of the MSS SAIDI/SAIFI limit applicable to that category of feeder as per Schedule 2 of the DA No. D01/99.
The intent of the improvement program is to improve the customer experience with prudent investment but does not anticipate that the distribution feeder performance will become favourable against the applicable category level MSS limit. Some distribution feeders are likely to have major performance influence from upstream sub-transmission networks, especially the rural distribution feeders supplied from radial sub-transmission network. Network improvement solutions on sub-transmission networks generally come at much higher capital costs, and such investment cannot be considered prudent to improve worst performing distribution feeder performance. WPF improvement program investment will be targeted to address the identified worst performing reliability drivers that are particular to the distribution feeder, only where prudent opportunities to do so exist.
The total expenditure for the 2025-30 period AER submission is based on the average project costs from existing WPF improvement program project cost estimates listed in Appendix 4.
Ergon Energy is targeting to address the performance of 15 distribution feeders per annum, to a total of 75 feeders over the 2025-30 AER regulatory period.</td></tr>
<tr><td>Expenditure</td><td>
<table>
<tr><th>Year</th><th>Previous period</th><th>2025-26</th><th>2026-27</th><th>2027-28</th><th>2028-29</th><th>2029-30</th><th>2025-30</th></tr>
<tr><td>$m, 2022-23 direct</td><td>3.5</td><td>2.4</td><td>2.4</td><td>2.4</td><td>2.4</td><td>2.4</td><td>12</td></tr>
</table>
</td></tr>
<tr><td>Benefits</td><td>Improvement in SAIDI/SAIFI performance for worst served customers from the implementation of WPF improvement program projects.</td></tr>
</table>

2 PURPOSE

This business case is for the continuation of the Worst Performing Feeder (WPF) improvement program into the AER 2025 to 2030 regulatory period. It is intended to provide a clear view of the profile of Ergon Energy's historical and forecast reliability capex (direct cost) that are explained and justified in this expenditure proposal summary.

3 BACKGROUND

Ergon Energy's average reliability performance is subject to Minimum Service Standards (MSS) set out in its Distribution Authority (DA) No. D01/99. MSS for Ergon Energy are applicable to three distribution feeder categories – Urban, Short Rural and Long Rural and for reliability measures SAIDI and SAIFI inclusive of both planned and unplanned performance.

The DA further sets out a requirement to deliver an improvement program targeted at identified "worst performing distribution feeders". Clause 11 of the DA states that Ergon Energy will "implement a program to improve reliability on the worst performing distribution feeders", "where a prudent opportunity to do so exists."

The WPF improvement program applies to any distribution feeder which meets the following criteria as defined in Clause 11.2 (c) of the DA:

(i) *"The distribution feeder is in the worst 5% of the network's distribution HV (high voltage) feeders, based on its three-year average SAIDI/SAIFI performance; and*

(ii) *The distribution HV feeder's SAIDI/SAIFI outcome is 200% or more of the MSS SAIDI/SAIFI limit applicable to that category of feeder."*

In October 2019 the DA WPF improvement program criteria were amended; with the main changes being the inclusion of distribution HV feeder SAIFI performance, and a change from a worst performing feeder count of 50 feeders to the worst 5% of the network's distribution HV feeders. These amendments to the criteria increased the number of distribution HV feeders eligible for the WPF improvement program.

In measuring performance against the MSS and identification of WPFs, the DA has provisions for exclusion of interruptions that are outside of a DNSP's direct control. The key exclusions include load shedding due to shortfall in generation, failure of shared transmission grids, and any interruption to the supply of electricity on the distribution entity's supply network which commences on a major event day (MED)[1]. In addition, interruptions caused by a customer's electrical installation or by a direction from an authorised person are also excluded.

Ergon Energy is also subject to annual reporting of the WPF improvement program in its Distribution Annual Planning Report (DAPR) to monitor and report on the reliability of the distribution entity's worst performing distribution feeders.

[1] "major event day" means a day as identified by using the 2.5 Beta method published by the Institute of electrical and Electronics Engineers (IEEE) in ANSI.Std 1366-2003 "IEEE Guide for Electric Power Distribution Reliability Indices".

3.1 Eligible Feeders for the WPF Improvement Program

The list of Ergon Energy worst performing distribution feeders, as defined by Clause 11.2(c) of the DA, is reported annually in the Ergon Energy DAPR. For the DAPR 2022 reporting period, the total number of feeders eligible for the WPF improvement program was 95 distribution feeders in total. The number of feeders per feeder category is listed as:

- 6 Urban category feeders:
    - The Urban worst performing distribution feeder list consists of 6 feeders. Two feeders met only the worst performing distribution feeder SAIDI criteria, two met only the SAIFI criteria and two met both the SAIDI and SAIFI criteria.
- 61 Short Rural category feeders:
    - The Short Rural worst performing distribution feeder list consists of 61 feeders. 22 met only the worst performing distribution feeder SAIDI criteria, 26 only met the SAIFI criteria and 13 met both the SAIDI and SAIFI criteria.
- 28 Long Rural category feeders:
    - The Long Rural worst performing distribution feeder list consists of 28 feeders. 27 met only the worst performing distribution feeder SAIDI criteria and one met both the SAIDI and SAIFI criteria.

Due to amended WPF criteria, the total of 95 eligible distribution feeders is almost double the annual number of WPF improvement program eligible feeders from the previous AER regulatory period (2020-25) submission, which was set at 50 worst performing feeders across all feeder categories and reported per annum in the Ergon Energy DAPR.

In addition to the increase in eligible feeders from the DA Clause 11.2(c) amendment from October 2019, the inclusion of SAIFI performance to the criteria changed the dynamic of distribution feeders eligible for the WPF improvement program. From the 2020-25 submission to now the average number of customers supplied by WPF improvement program eligible feeders has increased from 108 customers per feeder to 128 customers. The total number of customers supplied by eligible feeders has increased from 5,379 to 11,895. The average and total values represent the customer numbers connected to eligible feeders, as reported in the Ergon Energy DAPR 2018 and 2022.

3.2 Prudency and Efficiency of the WPF Improvement program

The National Electricity Rules set out objectives, criteria, and factors for CAPEX and OPEX that the AER must consider when deciding to approve an expenditure proposal. The basic requirement is that expenditures must be demonstrably prudent and efficient.

The National Electricity Objective as stated in the National Electricity Law is:

> *"to promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity with respect to:*
>
> - *price, quality, safety and reliability and security of supply of electricity*
> - *the reliability, safety and security of the national electricity system."*

In accordance with the National Electricity Objective, as well as the Best Practices and Asset Management Policy, Strategic Asset Management Plan, and Investment Processes, to maximise value from assets, Ergon Energy's investment objective is to plan the WPF improvement program prudently and efficiently and deliver long-term operational and capital expenditure, keeping

pressure off customer prices and achieving balanced commercial outcomes for a sustainable future.

The WPF improvement program is a prudent investment as it meets a need and best aligns with business objectives. Also, it is recommended to be made no earlier than is necessary to meet the need and aligns with corporate policies, strategies, and objectives. From a prudent investment perspective, it is projected that the WPF improvement program provides the greatest reliability value for customers supplied by the worst performing feeders in meeting the identified need though a set of considered engineering and/or operational solution options that address the feeder's performance drivers. In parallel, the scope of the selected investment projects is no more than is needed to meet the identified needs and based on validated unit costs reflecting market rates.

Reviewing synergies with other network projects is a standard aspect of the Ergon Energy's WPF improvement program. The review is performed during the distribution planning scoping phase of each eligible feeder improvement program project. Previous or existing projects on the eligible feeder, and upstream network assets, are assessed and considered in the project scope phase.

4 IDENTIFIED NEED

4.1 Compliance

The DA further sets out a requirement to deliver an improvement program targeted at identified "worst performing distribution feeders". Clause 11 of the DA states that Ergon Energy will "implement a program to improve reliability on the worst performing distribution feeders", "where a prudent opportunity to do so exists."

The WPF improvement program applies to any distribution feeder which meets the following criteria as defined in Clause 11.2 (c) of the Distribution Authority No. D01/99:

> *(i) "The distribution feeder is in the worst 5% of the network's distribution HV (high voltage) feeders, based on its three-year average SAIDI/SAIFI performance; and*
>
> *(ii) The distribution HV feeder's SAIDI/SAIFI outcome is 200% or more of the MSS SAIDI/SAIFI limit applicable to that category of feeder."*

To be compliant with the DA requirement Ergon Energy must deliver an improvement program.

4.2 Discussions with Customers

The Queensland Household Energy Survey (QHES) 2022 is a survey conducted annually to understand consumers' views of the energy sector, particularly in relation to electricity services. The survey is conducted on behalf of EQL (Ergon Energy and Energex Networks) and Powerlink Queensland. The (QHES) 2022 Electricity Sentiment section states that:

> *"Customer sentiment across all measures has reached record-high positive results. Since 2018, positive sentiment has increased for the attribute statements – reliability, security, trust and affordability.*
>
> *There is also a growing belief since 2018 that the balance is right between the cost and reliability of electricity supply, with a large majority content with the current balance.*
>
> *Over half of households said that they'd had a power outage in the six months prior to the survey being undertaken. This was evidently during a time when many areas of Queensland (particularly the state's south-east) were affected by significant rainfall and flooding, predominantly caused by the La Niña cyclic oceanic and atmospheric phenomenon.*

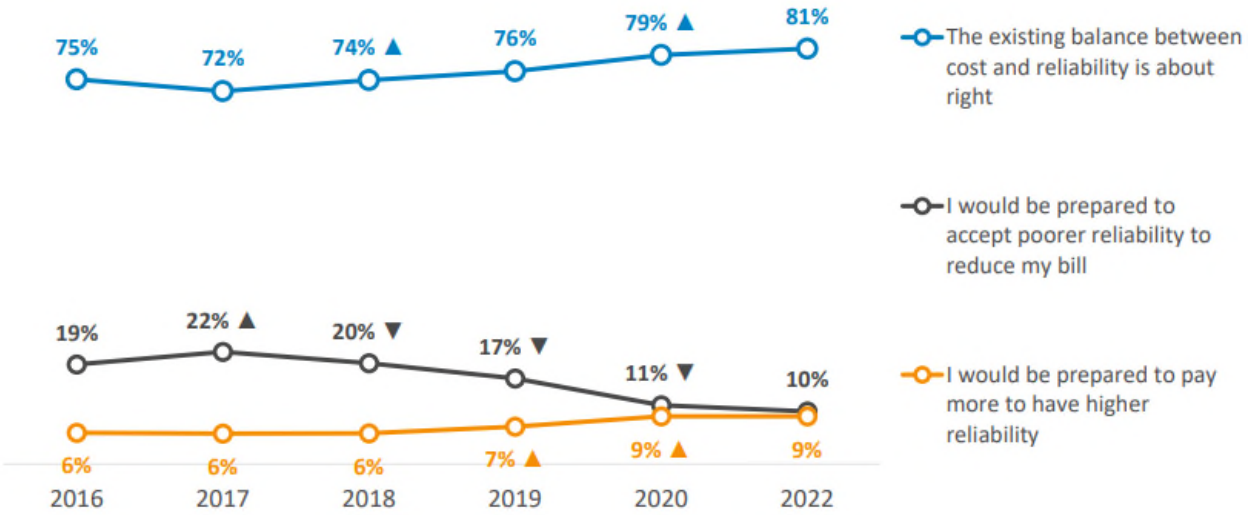
However, in general, households in Regional Queensland were more likely to have been affected by power outages than those in South East Queensland, highlighting the differences in network topologies and area geographics between the two regions.

Of those who had experienced power outages there was general satisfaction with the power restoration timeframe. Households affected by outages in South East Queensland had a higher satisfaction with restoration timeframes than those in Regional Queensland."

The QHES question on reliability: "These energy supplies provide my household with a reliable energy supply" has risen in a positive perception from 68% in 2018 to 74% in 2022, with the negative perception decreases from 6% to 3% from 2018 to 2022.

In regard to the question around the existing balance between cost of electricity and the reliability of the electricity supply the survey respondent's sentiment is shown in the figure below:

Figure 1: QHES Balance between Cost and Reliability



The survey response indicates an 81% sentiment that the balance between cost and reliability is about right. However, there is a significant reduction in respondents prepared to accept poorer reliability to reduce their bill, a reduction of 50% over 4 years, bringing this down to 10% of QLD respondents. This statement is further supported with an increase by 50% over the same period for the number of customers who are prepared to pay more to have a higher reliability, rising from 6% to 9% from 2018 to 2022.

Of the customers who had experienced power outages in the last six months prior to the survey, which was 63% of regional QLD respondents (n=1,135), only 59% were satisfied with the time taken to restore electricity to their home.

The number of eligible feeders to be selected for inclusion in the Ergon Energy yearly WPF improvement program, and the network solutions implemented, are aligned to keeping the balance of cost and reliability at levels acceptable to customers. The focus of the WPF improvement program is to reduce the number of customers impacted by power outages and the time taken to restore electricity to customer's homes following a power outage, in particular for worst served customers on the feeder. This is achieved, for example, by implementing network solutions such as installing automatic circuit reclosers and remote control to network assets at critical points in the network, which assist by providing enhanced fault diagnostic information, and in reducing both the number of customers impacted by unplanned events and the duration for some customers in unfaulted network sections (through sectionalisation and load transfer).

4.3 Risks of Non-Compliance

The risks of not implementing a five-year improvement program over the 2025-30 regulatory control period are presented in the table below. The risk assessment considered three risk categories: Compliance Legal & Regulatory, Customers and Community, and Stakeholder and Reputation.

Since 2018/19 Ergon Energy has been exceeding the MSS SAIDI thresholds set in the DA.

In January 2023, the Department of Energy and Public Works of the Queensland Government requested Ergon Energy to provide a report that demonstrates how Ergon Energy plans to return to compliance with its MSS SAIDI limits, as soon as practicable.

Ergon Energy has submitted the report detailing current and projected MSS SAIDI, the challenges Ergon Energy faces when addressing MSS SAIDI compliance, and the strategies in place, committed, or being considered to address exceedance of MSS SAIDI limits and reduce impacts from sustained outages for its customers. Among strategies is also our plan for the WPF Investment Program 25-30 included in this BC.

Table 1: Risk Assessment of Non-Compliance Scenario for the WPF Improvement Program

Risk Category	Risk Scenario	Current Risk Score C = Consequence L = Likelihood			Current Controls / Mitigations
		C	L	Score	
Risk 1: **Compliance, Legal & Regulatory**	Breach of legislated requirement. Risk of not implementing a worst performing distribution feeder 5-year improvement program as required under the Distribution Authority - No. D01/99 (Ergon Energy Corporation Limited).	Breach of legislative or regulatory obligation that requires notification to a regulator or external body that results in the issuing of a formal notice (e.g., infringement notice) and/or financial penalties imposed (up to $100,000).	Likely	Major	• Delivery of projects under current AER period WPF improvement program.
Risk 2: **Customers + Community**	Customer impact (Customers/duration/frequency) of a planned or unplanned event on a Worst Performing Feeder of not implementing the worst performing distribution feeder 5-year work improvement program. Resulting in customers continuing to experience higher frequency and duration of supply interruption.	Outages to localised communities or local critical infrastructure where > 1000 customer are impacted. (Low)	Possible	Minor	• Delivery of 5-6 worst performing distribution feeder improvement program projects per annum.
Risk 3: **Stakeholder + Reputation**	Risk to reputation of Ergon Energy of a negative local press story, or Local member of parliament action, of not implementing a worst performing distribution feeder 5-	Low levels of adverse attention. Single story, local media reporting. (Low)	Unlikely	Minor	• Delivery of projects under current AER period improvement program.

	year improvement program. Resulting in customers in worst served areas/communities continuing to have reliability performance meeting the improvement program criteria.				

5 OPTION 1 ANALYSIS

Option 1 is the delivery of the WPF improvement program to fulfil the Clause 11 requirement in the DA.

The WPF improvement program will be a five-year work program to improve the experience of the customers who are supplied by the consistently worst performing distribution feeders or feeder sections, however due to complex feeder configurations, customer density and operational limitations, and in accordance with prudency and efficiency principles, does not specifically aim to correct the feeder performance to become favourable against the applicable MSS limit. The investment will rather be targeted to address the identified performance drivers that are particular to the feeder and only where those investments are considered prudent.

5.1 Program Scope Summary

Ergon Energy is targeting to address the performance of 15 worst performing distribution feeders per annum, to a total of 75 feeders, over the 2025-30 AER regulatory period.

The proposed increase to the number of improvement program feeder projects is from a percentual perspective aligned to the number of feeders now eligible for the WPF improvement program because of the amendment to DA Clause 11.2 (c), as outlined in Section 3.1.

Over the 2025-30 AER regulatory period the number of worst performing distribution feeders eligible for the WPF improvement program will be updated yearly. As an example, the total number of worst performing distribution feeders in the Ergon Energy DAPR 2022 reporting period was 95, in the previous reporting period (DAPR 2021) the total number was 85. The DA Clause 11.2 (c) criteria is also based on performance over a three-year period, which results in worst performing distribution feeders being carried over in yearly reporting periods. The DAPR 2022 reporting period had 68 worst performing distribution feeders carried over from the previous reporting year period.

The yearly target of 15 worst performing distribution feeder projects is a balance of implementing projects on worst performing distribution feeders meeting the DA Clause 11.2 (c) criteria for the first time and on feeders that have previously exceeded, or continue to exceed, the criteria.

The 75 WPFs to be included in the improvement program will be selected based on multiple criteria such as customer numbers, frequency and intensity of historical adverse performance and past reliability improvement projects (if any) completed on the network.

The increased number of feeders also encompasses sensitive customers, e.g. life support customers, emergency services, schools, hospitals, care centres and water treatment plants. For reference, 42 of the worst performing feeders included in the DAPR 2022 supply a total of 199 sensitive customers.

Table 2 below shows the number of projects targeted annually under the WPF improvement program for the 2025-30 period. Ergon Energy will ensure that the investment in the WPF improvement program is prudently spread across different feeder categories and supply regions where the WPF improvement program criteria are met.

Table 2: Targeted annual number of WPF improvement program projects

	Previous period	2025-26	2026-27	2027-28	2028-29	2029-30	2025-30 total
Targeted No. of projects	5 per annum	15	15	15	15	15	**75**

5.1.1 Feeder Project Scope Summary

The reliability improvement solutions identified from the detailed WPF reviews will mainly include low to moderate capital investment options. Examples of low cost, quick win solutions include protection setting changes, installation of Line Fault Indicators (LFIs) with communication and Fuse Savers. The moderate investment options are likely to include installation of new Automatic Circuit Reclosers (ACRs), Sectionalisers, Remote Controlled Gas Switches (RCGS) and relocation and/or replacement of switching devices. There may be occasional higher investment options, like feeder ties and conductor replacements where justified.

In the analysis of the WPF candidate projects consideration has also been given to the sensitive customers supplied by the feeder.

The overall approach for the WPF improvement program includes the following in order of preference and affordability:

1. Improved network operation by:
    - Investigating historical reliability performance to determine predominant causes for unfavourable reliability performance.
    - Implementing reliability or operational improvements identified through the investigation of any unforeseen major outages.
    - Improving availability of information to field staff to assist fault-finding, which could include communications, data management and availability of accurate maps and equipment.
    - Planning for known contingency risks until permanent solutions are available.
    - Improving and optimising management of planned works.
2. Prioritisation of preventive-corrective maintenance by:
    - Scheduling asset inspection and defect management to poorly performing assets early in the cycle.
    - Scheduling poor reliability feeders first on the vegetation management cycle.
    - Undertaking wildlife mitigation (e.g., birds, snakes, possums, flying foxes, frogs) in the vicinity of worst performing distribution feeders.
3. Augmentation and refurbishment through capital expenditure by refurbishing or replacing ageing assets.
4. Implement optimum network capital expenditure solution.

Each worst performing distribution feeder will have a thorough engineering analysis of the feeder performance conducted. This analysis, based on historical performance, will consider any capital program works or previous projects implemented on the feeder and identify the potential engineering and/or operational solutions that can potentially improve the feeder performance. The worst performing distribution feeder engineering assessments will undergo a review process with

regional asset managers, planning and protection teams, and local operational teams to ensure the recommended solutions are prudent investments and are most likely to bring operational efficiency to achieve SAIDI/SAIFI improvements.

5.2 Program Delivery and Timing

The numbers of annual reviews and projects under the WPF improvement program during 2025-30 is expected to be uniform across the regulatory period. The improvement program will be determined annually and will be based on the feeders that, over a three-year period that have met the criteria defined in the DA Clause 11.2 (c). These feeders will also be reported in the DAPR every year.

The goal is to complete 15 improvement projects per regulatory year with the geographical location of project and resource requirements to be determined by the location of the feeders eligible for the WPF improvement program. The worst performing distribution feeders will be identified yearly, and feeder review priority will also be assessed yearly. Where possible, an even spread of the volumes of improvement work across regions will assist in achieving smooth regional workgroup, work delivery plans.

5.3 Costs

This section provides a summary of the forecast WPF improvement program expenditure for the next AER regulatory control periods (1 July 2025 to 30 June 2030).

All capital expenditure presented in this proposal is in 2022-23 direct cost dollars.

5.3.1 2025-30 WPF Improvement Program Cost Proposal

The amendment to the DA Clause 11.2 (c) criteria in October 2019 to also include those worst performing distribution feeders that exceeded 200% of the MSS SAIFI limit applicable to that category of feeder, has in effect doubled the number of worst served customers and distribution feeders eligibility. The scope of the solutions available to address the performance of feeders now eligible for the improvement program has resulted in the increase in individual project scope and the need to address performance on more eligible feeders.

The average cost of an improvement program feeder project in the 2020-25 period was $143k (direct cost). The average cost of a project was calculated based on the total costs of projects on selected eligible feeders from 1 July 2020. The average costs are for completed and estimated projects.

The period of post 1 July 2020 was selected as it is reflective of projects costs based on the most recent reliability performance results being experienced by customers, and the estimate costs to implement network solutions such as installing automatic circuit reclosers and remote control to network assets at critical points in the network. A sample of the projects, including a summary of the network solutions planned and the estimated costs, are listed in Appendix 4

Based on the historical costs of projects from the 2020-25 period and the need to address performance on the increased number of feeders now eligible for the improvement program the 2025-30 proposed project volumes and costs are shown in the table below. Due to inflation of costs, the unit rate for each project is estimated at $160k (direct cost).

Table 3: Cost proposal overview for 2025-30 WPF improvement program

Option	2025-26	2026-27	2027-28	2028-29	2029-30	Total 2025-30
2025-30 AER period project volumes	15	15	15	15	15	75
2025-30 AER period proposed cost 2022-23 $m	2.4	2.4	2.4	2.4	2.4	12

5.4 Option 1 Risks Assessment

The risk matrix diagram in Figure 2 below provides representation of how each of the risks identified in Section 4.3 are abated by the project investment and implementation. Table 4 shows the Risk Assessment target of implementing the WPF improvement program under Option 1.

Table 4: Risk Assessment target of Option 1

Risk Category	Risk Scenario	Target Risk Score C = Consequence L = Likelihood			Additional Planned Controls / Mitigations (Required until target can be achieved)
		C	L	Score	
Risk 1: **Compliance, Legal & Regulatory**	Breach of legislated requirement. Risk of not implementing a worst performing distribution feeder 5-year improvement program as required under the Distribution Authority - No. D01/99 (Ergon Energy Corporation Limited).	Breach of legislative or regulatory obligation that requires notification to a regulator or external body that results in the issuing of a formal notice (e.g., infringement notice) and/or financial penalties imposed (up to $100,000).	Rare	Sustainable	Continuance of delivery of projects under the 2025-30 AER period improvement program.
Risk 2: **Customers + Community**	Customer impact (Customers/duration/frequency) of a planned or unplanned event on a Worst Performing Feeder of not implementing the worst performing distribution feeder 5-year work improvement program. Resulting in customers continuing to experience higher frequency and duration of supply interruption.	Outages to localised communities or local critical infrastructure where > 1000 customer are impacted. (Low)	Unlikely	Minor	Increase number of worst performing distribution feeder improvement program projects delivered per annum to 15 projects.

Risk 3: **Stakeholder + Reputation**	Risk to reputation of Ergon Energy of a negative local press story, or Local member of parliament action, of not implementing a worst performing distribution feeder 5-year improvement program. Resulting in customers in worst served areas/communities continuing to have reliability performance meeting the improvement program criteria.	Low levels of adverse attention. Single story, local media reporting. (Low)	Very Unlikely	Sustainable	Continuance of delivery of projects under the 2025-30 AER period improvement program.

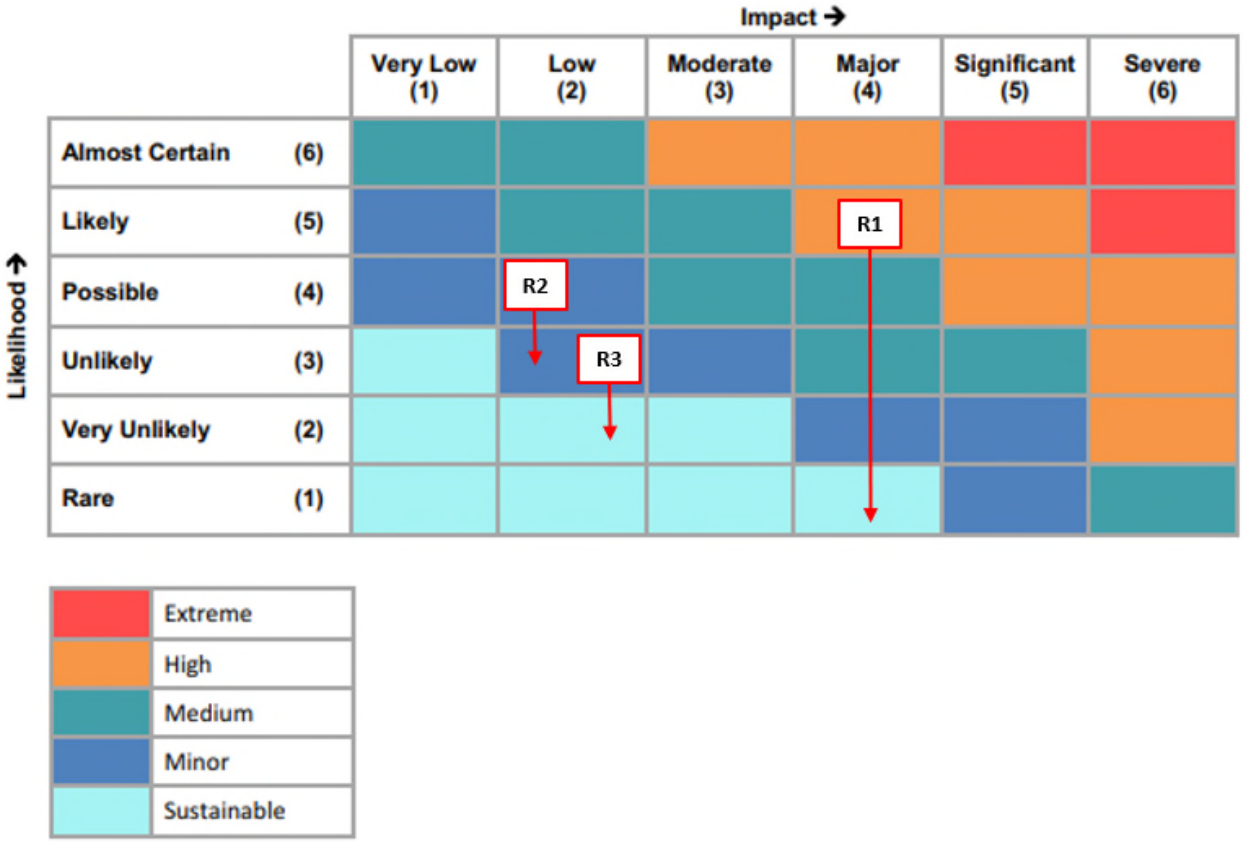


Figure 2: Level of risk calculation from Non-Compliance to Option 1 target

6 RECOMMENDATION

It is recommended to implement a WPF improvement program as outlined in Option 1. The WPF improvement program will be a 5-year work program to fulfil the Clause 11 requirement in the DA.

Option 1 is targeted to address the performance of 15 distribution feeders per annum in the Northern and Southern regions, to a total of 75 feeders, at the total estimated cost of $12M million over the 2025-30 AER regulatory period.

Appendix 1: Alignment with the National Electricity Rules

Table 5: Recommended Option's Alignment with the National Electricity Rules

NER capital expenditure objectives	Rationale
A building block proposal must include the total forecast capital expenditure which the DNSP considers is required in order to achieve each of the following (the capital expenditure objectives):	
6.5.7 (a) (1) meet or manage the expected demand for standard control services over that period	Ergon Energy has been successfully delivering the WPF improvement program for the current regulatory period for customers with the worst reliability outcomes. Detailed engineering assessments of around five worst performing distribution feeders have been targeted yearly, and solutions implemented when proven prudent and efficient.
6.5.7 (a) (2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;	Option 1 is the delivery of the WPF improvement program to fulfil the Clause 11 requirement in the DA.
6.5.7 (a) (3) to the extent that there is no applicable regulatory obligation or requirement in relation to: (i) the quality, reliability or security of supply of standard control services; or (ii) the reliability or security of the distribution system through the supply of standard control services, to the relevant extent: (iii) maintain the quality, reliability and security of supply of standard control services; and (iv) maintain the reliability and security of the distribution system through the supply of standard control services	There is a regulatory obligation for this expenditure.
6.5.7 (a) (4) maintain the safety of the distribution system through the supply of standard control services.	Safety is at the forefront of consideration for this capital expenditure. The WPR improvement program projects enhance safety of the distribution network, and in supply to the customers, through installation of remote controllable switching and protective devices.
NER capital expenditure criteria	**Rationale**
The AER must be satisfied that the forecast capital expenditure reflects each of the following:	
6.5.7 (c) (1) (i) the efficient costs of achieving the capital expenditure objectives	In compliance with the DA obligation, the WPF improvement program reviews and analyses eligible feeder for tailored network reliability improvement measures. Improvement projects are reviewed and progressed when deemed the most efficient network improvement solution.
6.5.7 (c) (1) (ii) the costs that a prudent operator would require to achieve the capital expenditure objectives	Improvement projects are reviewed and progressed when deemed prudent and aligned with historical WPF improvement program project expenditure.
6.5.7 (c) (1) (iii) a realistic expectation of the demand forecast, and cost inputs required to achieve the capital expenditure objectives	The demand forecast is based on historical WPF improvement program expenditure. The most recent (projects for feeders reviewed post the DA Clause 11 amendment) improvement program projects have used as the most realistic guide to forecast expenditure for the AER 2025-30 submission.

Appendix 2: Reconciliation Table

Table 6: Reconciliation

Expenditure	DNSP	2025-26	2026-27	2027-28	2028-29	2029-30	2025-30
Expenditure in business case $m, direct 2022-23	Ergon Energy	2.4	2.4	2.4	2.4	2.4	12.0

Appendix 3: Strategic Alignment

Alignment to Energy Queensland's Strategic Framework

This investment aligns with the following Energy Queensland 'Enable' Building Blocks:

Table 7: Alignment to 'Enable' Building Blocks

'Enable' Building Blocks	How this investment contributes	Impact
1. Safety The safety of our people, customers and communities is our first priority	Contributes toward a distribution feeder network with smart control and safety of as a priority by reducing distribution feeder event impacts.	Low
2. Keep the lights on We will design, build and maintain a safe and reliable electricity network	Delivery of an improvement program aimed at improving reliability of supply to customers on worst performing distribution feeders.	Low
3. Financial sustainability We will ensure funds spent are done so prudently and we will grow our revenue streams	Delivery of targeted and prudent network investments that keep worst served customers connected with less disruption to revenue generating streams.	Low
4. People & Culture Continue to build a capable & productive workforce to ensure we deliver EQL's electric life ambition.	An improvement program delivered with a culture that utilises engineering best practice and developing projects with an aim of best outcomes to worst served customers and resilient assets.	Low

Regulatory and Compliance Obligations

The proposed investment addresses the following regulatory and compliance obligation.

Table 8: Alignment to Regulatory/Compliance Obligation

Regulatory/ Compliance Obligation	How this investment contributes to compliance	Implication	Residual Risk Level
DNSP Licence Conditions	▪ This investment delivers an improvement program as required under the Distribution Authority No. D01/99 (Ergon Energy Corporation Limited) Clause 11.	▪ Breach of legislated requirement.	Medium

Appendix 4: WPF Improvement Program Project 2020-25 Costs

Table 9: WPF improvement program project costs – post 1 July 2020

Year Identified	Year Reviewed	Feeder Asset No.	Capital Works Description	Work Request	Estimate DC
2019-20	2020-21	109	Install a remote control recloser Install comms to 3 x regulators	1625143	$116,145
2019-20	2020-21	F004Q	Install 2 x remote control reclosers (replace existing OCRs)	1625174	$96,866
2020-21	2021-22	F351C	Install a remote control recloser	1708256	$87,486
2020-21	2021-22	ML-01	Install 2 x remote control reclosers	1701699	$118,706
2020-21	2021-22	209	Install regulator with comms	1701697	$96,863
2020-21	2021-22	112	Install a remote control recloser Install a remote control load break switch	1701698	$164,481
2020-21	2021-22	338	Install a remote control load break switch Install comms to a regulator	1701700	$154,298
2020-21	2021-22	F096D	Reconductor 600m of three phase Reconductor 1.2km of single phase Install 600m of three phase conductor Install a remote-control load break switch	1724340	$353,549
2021-22	2022-23	242	Install 2 x remote control reclosers Install a remote control load break switch	1786017	$188,025
2021-22	2022-23	354	Install 2 x remote control regulators	1786019	$203,314
2021-22	2022-23	CM201	Install a remote control recloser	1786974	$84,465
2021-22	2022-23	F079S	Install a remote control recloser	1791558	$57,793
			Average Cost		**$143,499**

Appendix 5: Two Examples of Worst Performing Feeders

Example one Northern region – Feeder 112:

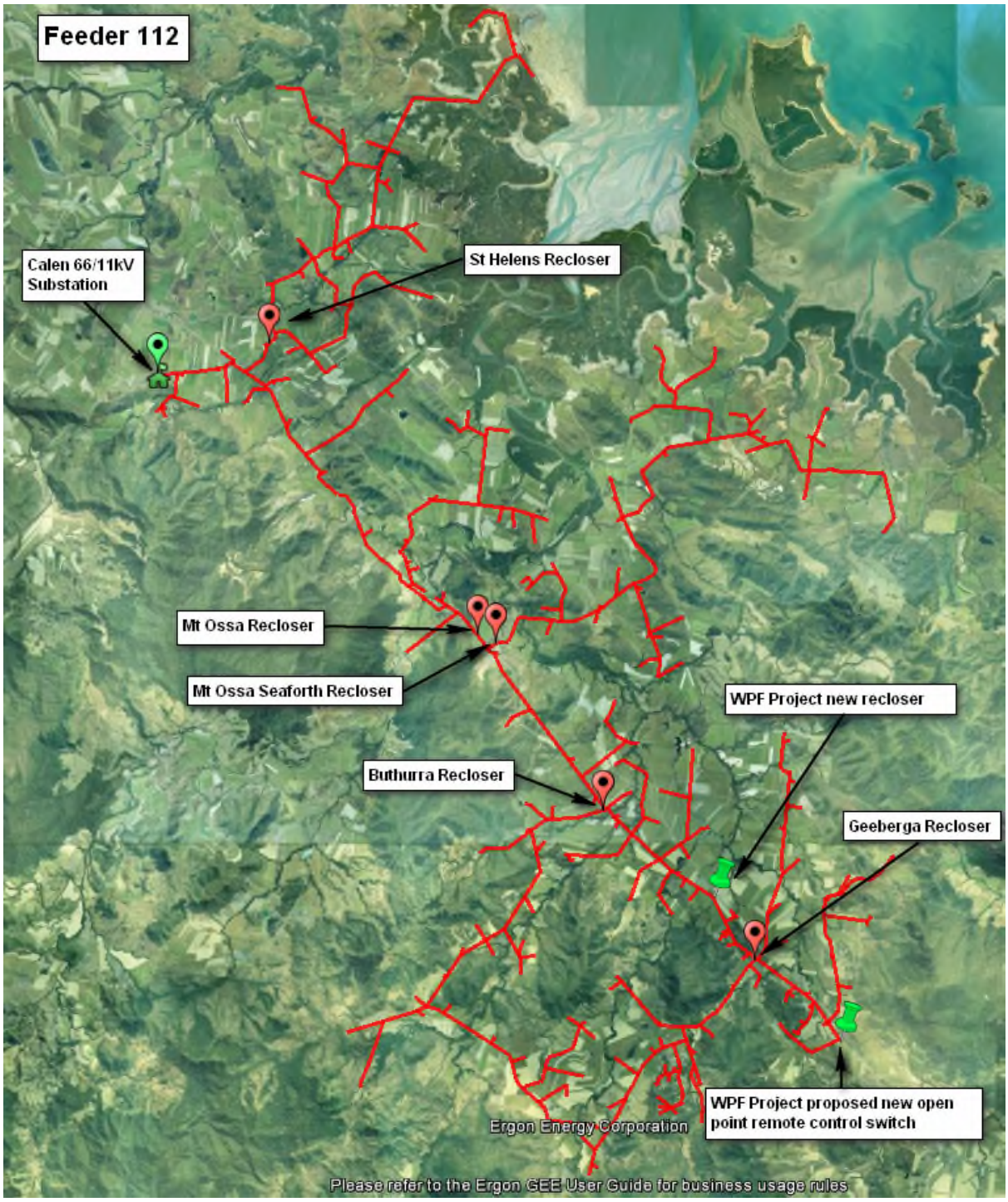


Figure 3: Google Earth view of example WPF (highlighted in red) in the Northern region – Feeder 112

Table 10: Feeder Characteristics (2021/22) of example WPF in the Northern Region – Feeder 112

Feeder Characteristics (2021/22)	Value
Feeder name	112
Area of supply and Region	Pioneer, Northern region
Nominal voltage	11kV
Feeder Length	218 km
Number of switching devices (with remote control)	Five reclosers
Number of customers	850
Number of sensitive customers	11
Total customer minutes off supply	1,377,000
Total number of outages	99
Energy not supplied (MWh)	23

Example two Southern region – Feeder CM201

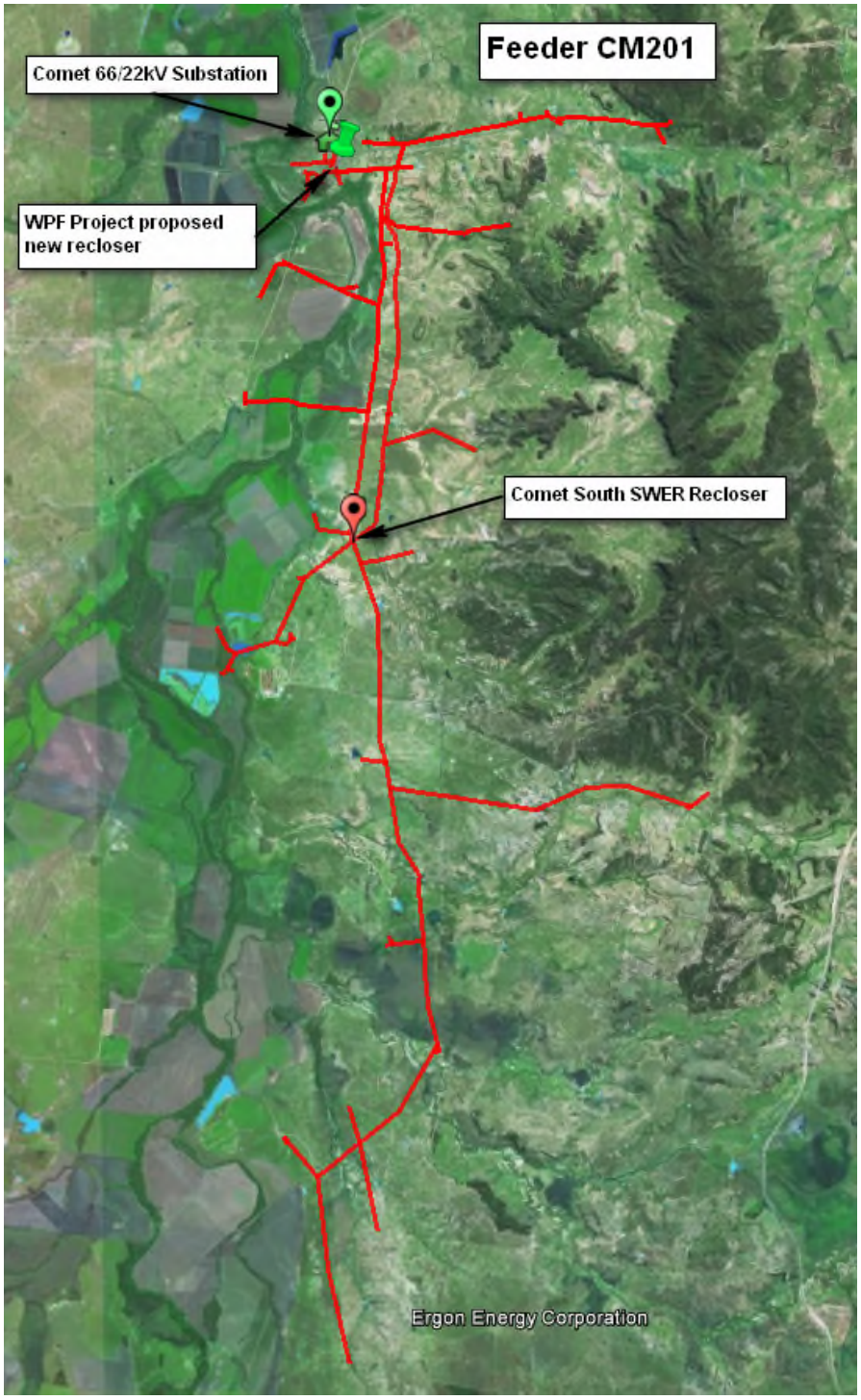


Figure 4: Google Earth view of example WPF (highlighted in red) in the Southern region – Feeder CM201

Table 11: Feeder Characteristics (2021/22) of example WPF in the Southern Region – Feeder CM201

Feeder Characteristics (2021/22)	Value
Feeder name	CM201
Area of supply and Region	Central Highlands, Southern region
Nominal voltage	22kV
Feeder Length	136 km
Number of switching devices (with remote control)	One recloser (SWER recloser)
Number of customers	100
Number of sensitive customers	2
Total customer minutes off supply	1,160,900
Total number of outages	37
Energy not supplied (MWh)	10

Appendix 6: Glossary

The following definitions, abbreviations and acronyms appear in this business case:

Definition, abbreviation, or acronym	Definition
ACR	Automatic Circuit Recloser
AER	Australian Energy Regulator
CAPEX	Capital Expenditure
DA	Distribution Authority
DAPR	Distribution Annual Planning Report
Distribution Customer	A customer with an active account and with an active National Metering Identifier, excluding unmetered customers
DNSP	Distribution network Service Provider
EQL	Energy Queensland Limited
HV	High Voltage (distribution feeder voltages)
Interruption	Temporary unavailability of electrical supply to either customer or asset associated with an outage of the supply network including outages affecting single premises, but does not include disconnections
LR	Long Rural Feeder - a feeder which is not an urban feeder or isolated feeder and has a total feeder route length of greater than 200km
MED - Major Event Day	Major Event Day is a day identified by using the 2.5 Beta method published by the IEEE, where network outages are so high on a given day, exceeding reasonable design and operational limits of the electric power system that the DNSP is able to exclude all outages on that day from their network performance reporting
MSS	Minimum Service Standard
OPEX	Operational Expenditure
QHES	Queensland Household Energy Survey
RCGS	Remote Controlled Gas Switches
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SR	Short Rural Feeder – a feeder which has a total feeder route length less than 200km and is not an urban feeder or isolated feeder
UR	Urban Feeder - a feeder that has a three-year average maximum demand over the three-year average feeder route length greater than 0.3 MVA/km
WPF	Worst Performing Feeder