Pole Replacements

Business Case

25 January 2024

Part of Energy Queensland

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DOCUMENT VERSION

Version Number	Change Detail	Date	Updated by
Draft v0.1	Draft	13/10/2023	Snr Engineer Asset Strategy
Draft v0.3	Draft Submitted to Reg team	14/11/2023	Manager Asset Strategy
V1.0	Finalised	15/11/2023	Manager Asset Strategy

RELATED DOCUMENTS

Document Date	Document Name	Document Type
JAN 2024	Asset Management Plan - Poles	PDF
NOV 2023	Pole Risk modelling	Docx & Excel
NOV 2023	Poles CBRM/CNAIM Model R-code	Excel
JUN 2023	RIN 2.2 Compare 2021-22 (Rosetta)	Excel
NOV 2023	Ergon 2022-23 - Category Analysis - RIN Response - Consolidated - 23 November 2023 – PUBLIC (16058117.2)	Excel
AUG 2023	Maintenance Activity Frequency (MAF) – Release 2	PDF
JUN 2023	Maintenance Acceptance Criteria (MAC) – Release 11	PDF
OCT 2023	Lines Defect Classification Manual	PDF
JUL 2023	Substation Defect Classification Manual	PDF
OCT 2023	Australian Government, Department of the Prime Minister and Cabinet (Office of Best Practice Regulation) – Best Practice Regulation Guidance Note - Value of a Statistical Life:	PDF
ND	Australian major natural Disasters.xlsx (a compendium of various sources)	Excel

1 SUMMARY

Title	ERG Poles Business Case AER 2025-30
DNSP	Ergon Energy Network
Expenditure category	☒ Replacement ☐ Augmentation ☐ Connections ☐ Tools and Equipment ☐ ICT ☐ Property ☐ Fleet
Purpose	The purpose of this business case is: • to justify the benefits of the proposed volume of pole replacements/reinforcements for the AER regulatory period 2025-30 investment • to support the Ergon Energy forecast capital expenditure over the regulatory period via a cost benefit analysis.
Identified need	☒ Legislation ☒ Regulatory compliance ☒ Reliability ☐ CECV ☒ Safety 6 ☒ Environment ☒ Financial ☐ Other Ergon Energy is committed to adopting an economic, customer value-based approach when it comes to ensuring the safety and reliability of the network. To support the advantages of this approach for the community and businesses over the modelling period, we have employed Net Present Value (NPV) modelling. This commitment is in line with our efforts to maximise the value for our customers. Investment in the replacement/reinforcement of poles is required to comply with legislative and regulatory obligations and to manage reliability, financial, safety, and environmental risks. Ergon Energy has a regulatory obligation as outlined in the Electrical Safety Code of Practice (ESCOP) 2020 Works Section 5.1 that states "*An electricity entity should have a maintenance system that achieves a minimum three-year moving average reliability against the incidence of failure of 99.99 per cent a year. Special consideration should be given to poles in areas of higher risk, such as 'cities and towns*". Pole failures were tracking high in Ergon Energy for the last seven years with a three-year moving average over 100 failures, exceeding the code of practice limit. In the period preceding 2018-19, we noted that these failures were increasing, and we implemented a change to our serviceability calculation to reduce pole failures to achieve the legislative targets. This strategy has improved our asset performance and indicate that we need to continue with similar replacement volume as a minimum to maintain or improve our performance. A cost benefit analysis has been conducted to confirm that the forecast pole replacements are prudent capital investments.

<table>
<tr><td>Summary of intervention option</td><td>Four different replacements/reinforcement intervention options were considered and compared along with the continuation of the counterfactual (Current defect rate - Average 16,622 poles/year) replacement option, as follows:
1. REPEX Model Cost Scenario – Avg 10,423 poles/year
2. CBRM Health Index (>=7.5) – Avg 13,250 poles/year
3. REPEX Model Live Scenario – Avg 5,745 poles/year
4. Additional targeted Replacement – Avg 18,622 poles/year.</td></tr>
<tr><td>Expenditure</td><td>This business case relates only to defective pole replacements / reinforcements based on serviceability criteria identifying imminent failures. Consequential investment under other program and their respective benefit is included in the respective business cases such as the overhead conductor business case.
<table>
<tr><th>Year
$m, direct 2022-23</th><th>2025/26</th><th>2026/27</th><th>2027/28</th><th>2028/29</th><th>2029/30</th><th>Total</th></tr>
<tr><td>Defect*</td><td>83.0</td><td>83.0</td><td>83.0</td><td>83.0</td><td>83.0</td><td>415.0</td></tr>
<tr><td>Pole-top (consequential)*</td><td>27.0</td><td>27.0</td><td>27.0</td><td>27.0</td><td>27.0</td><td>135.0</td></tr>
<tr><td>Services (consequential)*</td><td>5.4</td><td>5.4</td><td>5.4</td><td>5.4</td><td>5.4</td><td>27.0</td></tr>
<tr><td>Distribution TXs (consequential)*</td><td>13.2</td><td>13.2</td><td>13.2</td><td>13.2</td><td>13.2</td><td>66.0</td></tr>
<tr><td>Fuses (consequential)*</td><td>9.1</td><td>9.1</td><td>9.1</td><td>9.1</td><td>9.1</td><td>45.6</td></tr>
<tr><td>Distribution SWs (consequential)*</td><td>3.6</td><td>3.6</td><td>3.6</td><td>3.6</td><td>3.6</td><td>18.0</td></tr>
<tr><td>Consequential*</td><td>58.3</td><td>58.3</td><td>58.3</td><td>58.3</td><td>58.3</td><td>291.5</td></tr>
<tr><td>Conductor Consequential #</td><td>15.8</td><td>16.5</td><td>17.0</td><td>17.4</td><td>17.6</td><td>84.3</td></tr>
<tr><td>Business Case Total Investment</td><td>141.3</td><td>141.3</td><td>141.3</td><td>141.3</td><td>141.3</td><td>706.5</td></tr>
</table>
* Expenditure considered for this business case.
# Expenditure included in other investment program (Overhead Conductor)</td></tr>
<tr><td>Benefits</td><td>After a thorough evaluation of all available options, it has been confirmed that the ‘counterfactual’ option is the optimum and most prudent option. This option has been chosen over other options, as it provides the best balance of benefits and risks for the organisation and community. As such, the decision has been made to continue operations as usual to maintain the current performance, with a focus on optimizing existing processes and enhancing efficiencies where possible.</td></tr>
</table>

2 PURPOSE AND SCOPE

The purpose of this document is to justify the proposed volumes of replacement and expenditure of our pole replacement program for the 2025-30 regulatory period. The proposed pole replacement program is in accordance lifecycle management strategies detailed in the Asset Management Plan Poles. A financial NPV model has been completed to evaluate and compare alternative options was used to demonstrate that the proposed expenditure is prudent.

This business case covers both the costs and benefits directly associated with defective poles as well as the cost and benefits for the replacements of pole-top structures, service lines, transformers and distribution switchgear that will be required while replacing these defective poles. Costs and benefits of pole replacements that will occur as a part of other projects or programs, such as reconductoring, are included in their respective business case.

This document is to be read in conjunction with the Asset Management Plan Poles which contains detailed information on the asset class, populations, risks, asset management objectives, performance history, influencing factors, and the lifecycle strategy.

All dollar values in this document are based upon real 2022-23 dollars and exclude overheads.

3 BACKGROUND

After experiencing rising trend of pole failures causing safety/reliability concerns, in 2018-19 we comprehensively reviewed our pole inspection, serviceability assessment and methodologies to ensure that they are aligned with industry best practice, were accurate and reliable and yielded credible results consistent with expectations. This review is to enable us to accurate model and assess our pole health and serviceability to ensure the provision of a safe and reliable electricity distribution network for our customers in urban, rural and regional Queensland.

In addition, we have made significant improvement to the quality of the failure data, the data gathered by pole inspectors in the field and the data systems which rely on the pole data. The improved failure data capture has uncovered an escalating unassisted pole failure rate; particularly in poles with a low nominal strength.

Following the review, we have implemented the following:

- Reduced the pole inspection cycles of six and eight years to five years. This is in alignment with the legislative requirement to identify defects early.
- Improved field staff training in data capture and collection.
- Improved pole inspection serviceability calculations which improve the accuracy in the estimation of residual pole strength, the classification of unserviceable poles and the estimation of pole health and probability of failure in current and future years.

These efforts have resulted in a significant rise in number of defects identified requiring remedial actions including replacement/reinforcement in commencing 2018-19. Our efforts are starting to yield positive results as reflected in our actual failure rate reduction in recent years.

Therefore, our replacement/reinforcement volume is recommended to continue to bring the failure rate below ESCOP levels, as indicated in the counterfactual replacement proposal.

3.1 Asset Population

Ergon Energy Network have a total of 981,665 poles including 871,347 wood poles, as detailed in Figure 1. Approximately 19% of the current Ergon Energy pole population is older than 50 years old, with another 5% of the population due to reach this age in the next 5 years.

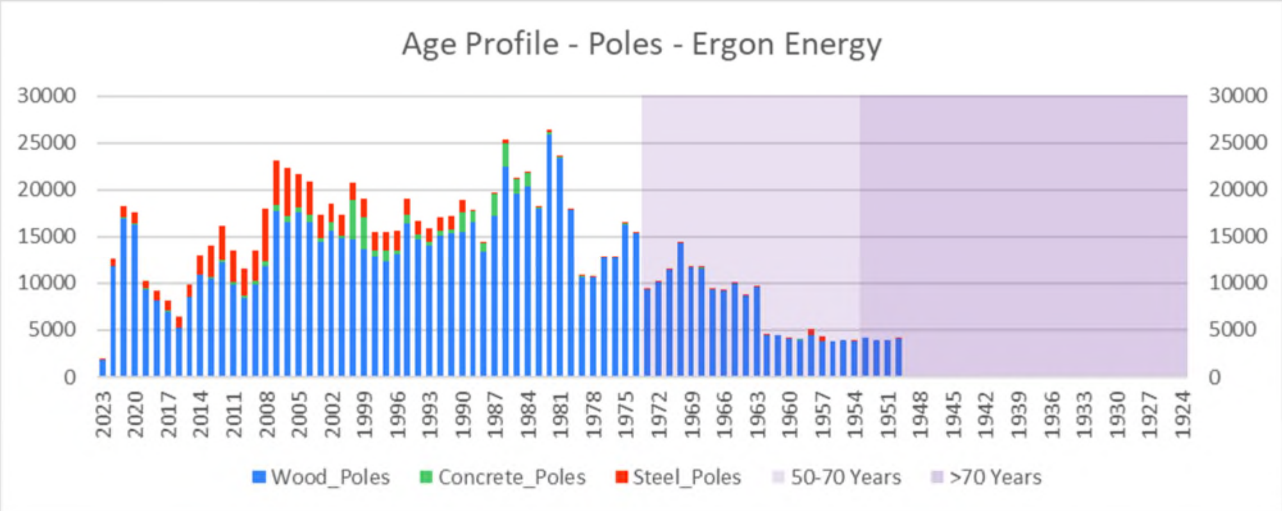

Figure 1: Network Pole Age Profile

3.2 Asset Management Overview

Poles are very high volume, relatively low individual cost asset, and are managed on a population basis through periodic inspection for condition and serviceability. Poles are currently inspected and tested every five years and assessed for serviceability based on clear criteria set out in the Network Schedule of Maintenance Activity Frequency Master 2024-25 in compliance with our Poles and Towers Asset Maintenance Strategy. Pole serviceability is driven by well-established inspection programs which identify severe structural strength degradation. Structural strength is determined in accordance with AS/NZS7000:2016.

All the poles reinforced or replaced are based on their condition failing to meet the acceptance criteria through visual inspection assessment or serviceability calculation and are classified as defective as per descriptions in Standard for Classifying the Condition of Network Assets. Pole reinforcement by nailing/staking is considered effective to prevent failure and replacement due to decay caused by the soil and hostile ground conditions and hence providing a life extension of 10-15 years. Under the Electrical Safety Code of Practice 2020 Works, poles identified as defective require rectification within standard timeframes as set out in Section 5.3.4 of the ESCOP.

3.3 Asset Performance

The two main functional failures considered in this Business case and the associated modelling are defined in Table 1.

Functional Failure Type	Description
Catastrophic **(unassisted failure)**	Loss of structural integrity of a pole, excluding any associated hardware or crossarm mounted plant, such that the residual strength of the component required immediate intervention. Functional failure of this asset under normal operating conditions not caused by any external intervention such as abnormal weather or human.
Degraded (**defect**)	A pole asset deemed defective based on serviceability calculation criteria and if not rectified within a prescribed timescale (P0/P1/P2) could cause to an unassisted catastrophic failure.

Table 1: Description of Functional Failure

Identified defects are scheduled for repair according to a risk-based priority scheme (P0/P1/P2/C3/no defect). The P0, P1 and P2 defect categories relate to priority of repair, which effectively dictates whether normal planning processes are employed (P2), or more urgent repair works are initiated (P1 and P0).

The total number of unassisted pole failures is shown in Figure 2. The majority is contributed by wood poles which make up approximately 89% of the pole population but represent 99.7% of the unassisted pole failures, mainly due to degradation caused by rot and termites.

Our failure data indicates that pole failures are currently averaging 105 poles per year with yearly fluctuations. This is above the three-year moving average limit of 97 poles per year; a reliability limit set out by the ESCOP of 1:10,000 pole failures i.e., a failure rate of 0.01% per year.

Steel poles and concrete poles make up 8%, and 3%, respectively, of the population while contributing only 0.1% to pole failures.

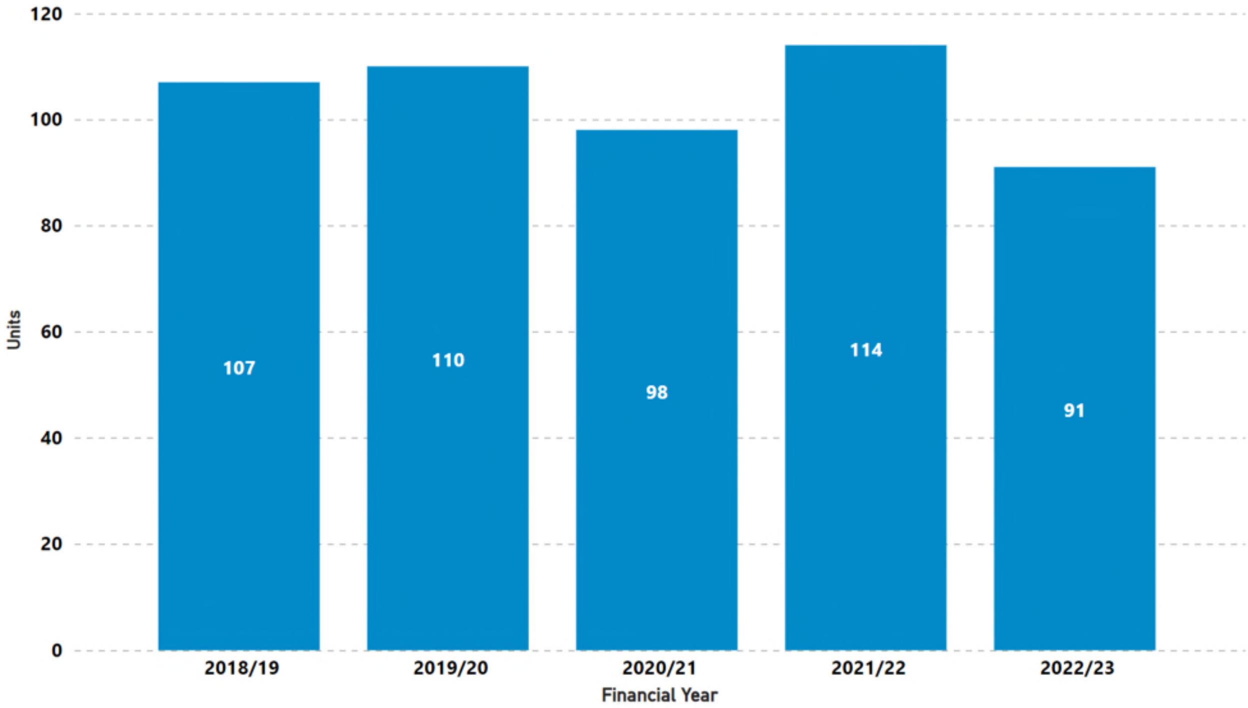

Figure 2: Unassisted Pole Failures

Figure 3 provides the quantity of defects for wood poles resulting in pole replacement and Figure 4 provides the quantity of defects for wood poles resulting in pole reinforcement. The defect data indicates a step change in 2019-20 approximately doubling the identified unserviceable poles requiring remediation. The primary reason for this step change in 2019-20 are the changes made to the pole serviceability calculations described previously, resulting in many more poles assessed unserviceable requiring replacement or reinforcement. Additionally, reduction in inspection cycle from six and eight years to five years along with the improvement in data quality and recording system has contributed significantly to rising number of identified defects over the years.

The defect data also indicates stabilising since 2019-20 while the reinforcement data still fluctuating substantially each year.

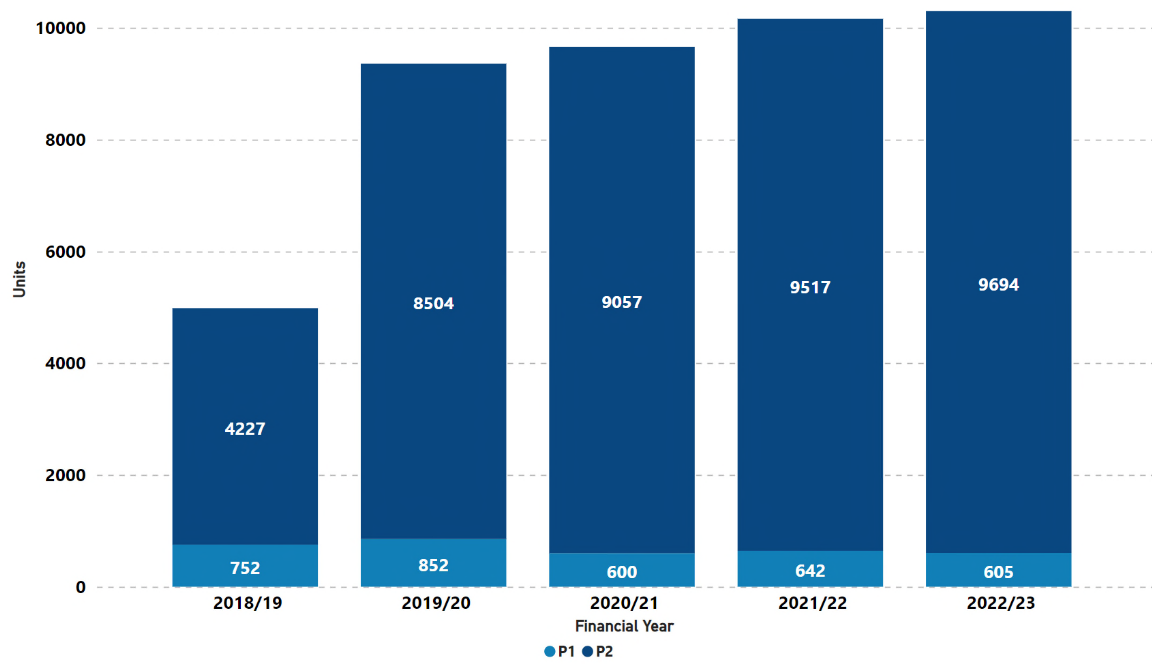

Figure 3: Defects - Unserviceable Wood Poles

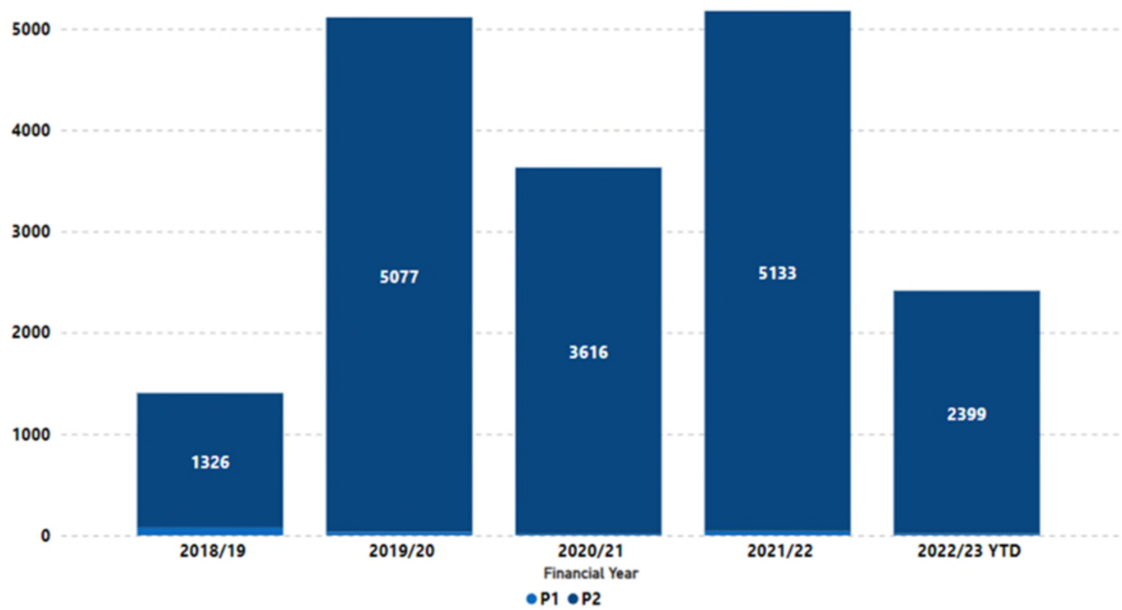

Figure 4: Defects - Unserviceable Wood Poles Reinforced

Figure 5 provides the quantity of defects for steel poles. The significant variation in the data is possibly caused by the improved recording of the defects and failures in correct categories.

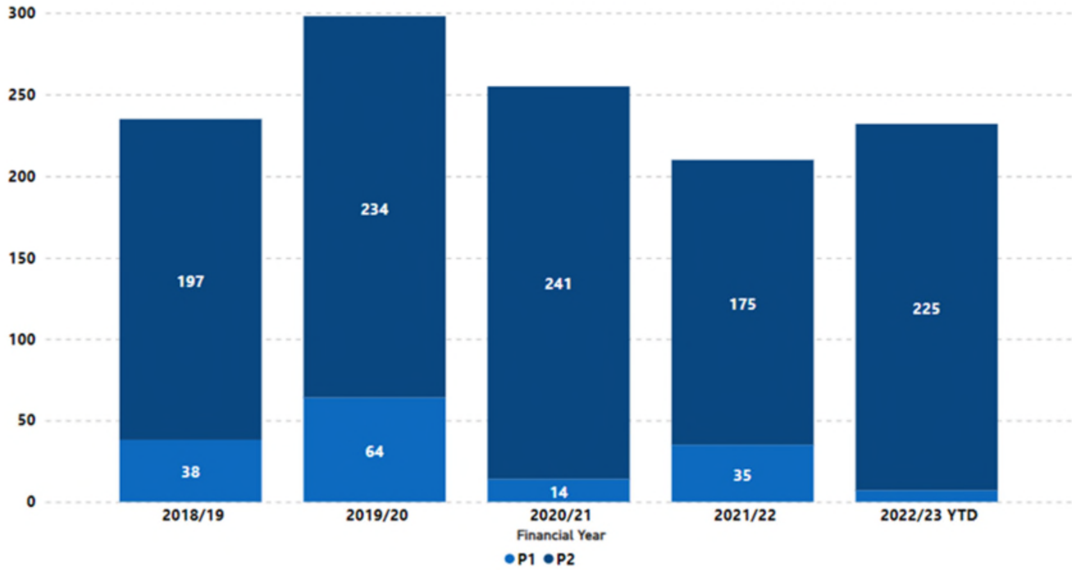

Figure 5: Defects - Steel Pole Defects

Figure 6 provides the quantity of defects for concrete poles which is negligible at this stage in comparison to steel and wood poles.

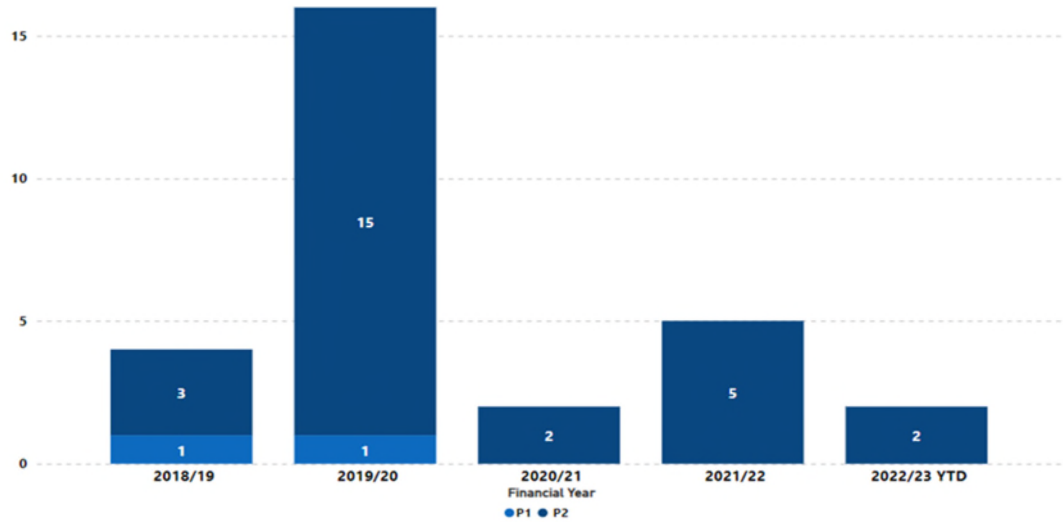

Figure 6: Defects - Concrete Pole Defects

Figure 7 provides the quantity of defects for pole stays. Pole stays are an important part of the mechanical support system for poles and structures, used to balance the forces imposed at the top of a pole or structure, therefore ensuring the poles do not fail unexpectedly due to mechanical stress. In 2022, improvements have been made to stay inspections practices and identification of defective stays, to address an increasing failure rate and significant public safety concerns, resulting in the step change of stay defects in 2021-22 and 2022-23 YTD.

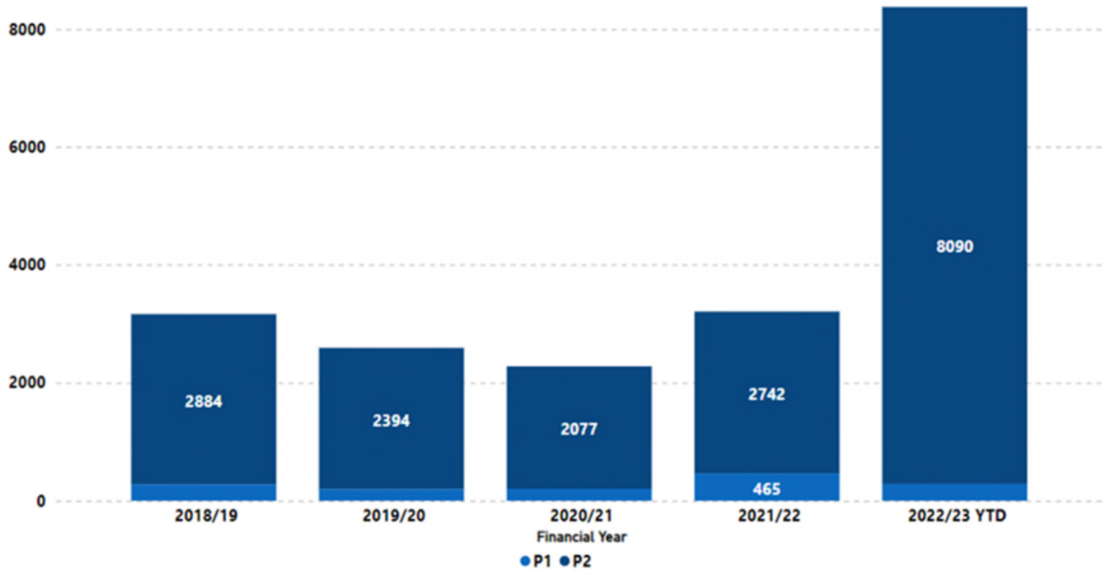

Figure 7: Defects - Stay Defects

4 RISK ANALYSIS

In evaluating the risks associated with our pole assets, we model each pole individually, with location and condition data specific to each pole, while also factoring to the extent possible other factors such as the electrical load the feeder, the pole support carries and locational factors that are important to outcomes from an unassisted pole failure.

As such, our cost benefit analysis is aimed at calibrating our serviceability calculation at the program level, so that on average we will be able to maximise the benefits to customers. As such, following the cost benefit analysis through NPV modelling, the most positive NPV of the volumes considered will form the basis for selecting the preferred option about reinforcement/replacement. In the case of this business case, the most positive NPV validates the volume of reinforcement/ replacement undertaken over the review period is a prudent approach.

The monetised risk is simply calculated as per the calculation in Figure 8.

Figure 8: Monetised Risk Calculations

Ergon Energy broadly considers five value streams for investment justifications regarding replacement of widespread assets. These are shown in Figure 9. For poles, only four of the value streams are considered; the 'Export' is not material to poles.

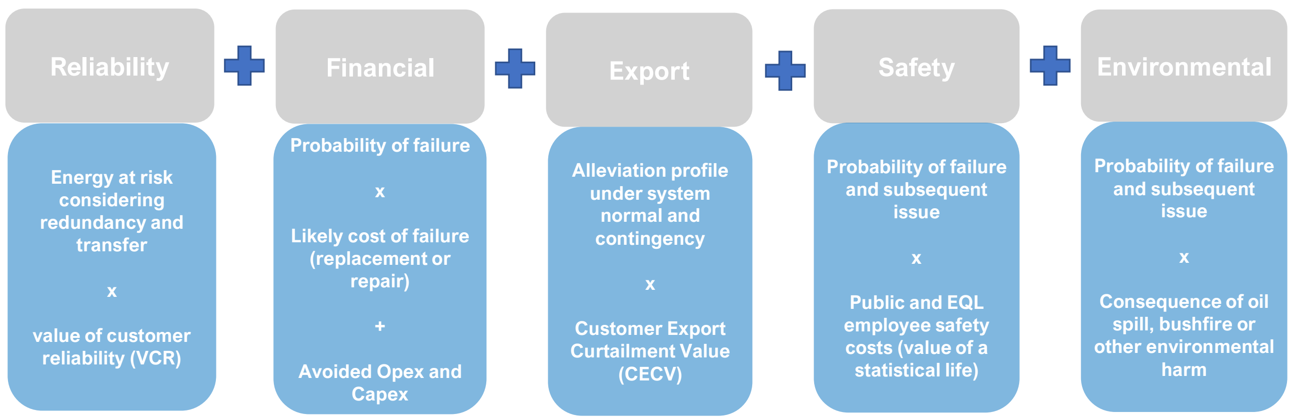

Figure 9: Risk Stream for Assets

4.1 Health Index and Probability of Failure (PoF) - Poles

Ergon utilises EA Technology's Condition Based Risk Management (CBRM) and Common Network Asset Indices Methodology (CNAIM) principles to determine the condition of our pole population. These models utilise condition data such as observed ground level deterioration and pole rot condition and measured condition data such as strength ratio and sound wood measurement to determine the Health Index (HI) of a pole asset. The condition data is collected through our inspection program.

Each pole in our population has an individual HI score, which means that the type of pole, location and condition is factored into the HI calculations.

Condition based risk management model combines asset information, engineering knowledge and practical experience to define the current and future condition and performance for network assets as shown in Figure 10 and Figure 11. The HI is calculated on a scale of 0 to 10 which represents the extent of condition degradation:

- 0 indicating best condition or a new pole
- 10 indicating the worst condition.

The relationship between HI and PoF is not linear, an asset can accommodate significant degradation with very little effect on the risk of failure. Conversely, once the degradation becomes significant or widespread, the risk of failure rapidly increases.

A HI of 7.5 has/is typically been used as the point at which assets are identified as candidates for requiring an intervention.

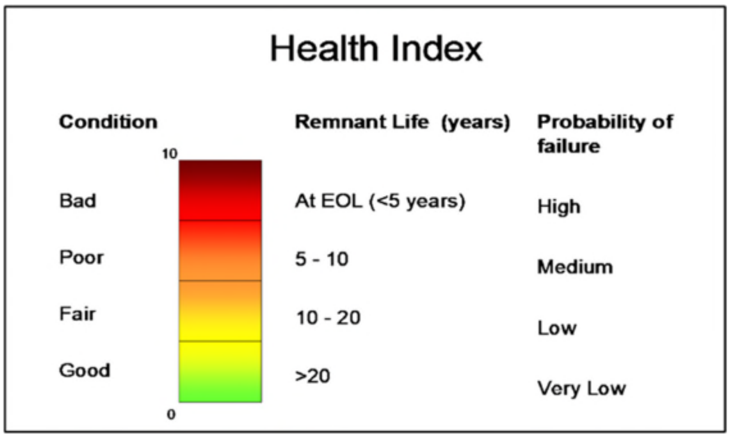

Figure 10: PoF/HI Relationship

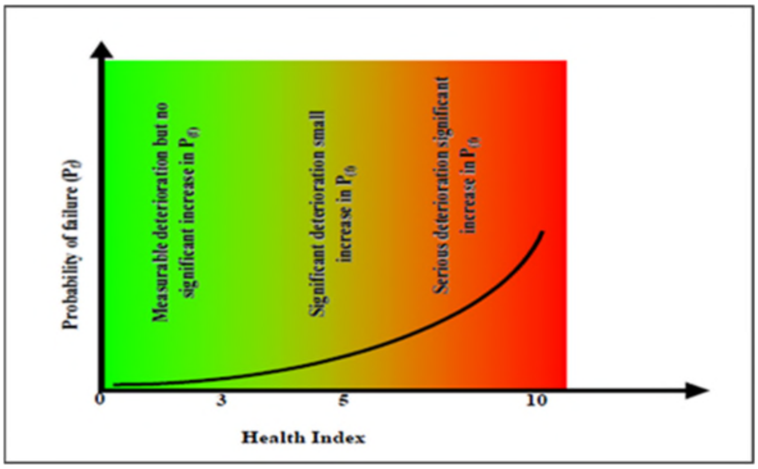

Figure 11: HI and PoF Relationship Graph

Figure 12 also illustrate that approximately 40,340 poles are forecast to be assessed with HI of over 7.5 in the year 2023, requiring intervention in next three years along with P0 and P1 defective poles identified through inspections. Although majority of the defective poles are expected to be the part of the very poor condition pole population (HI ≥ 7.5), but defective poles requiring nailing or replacements from remaining population specifically in poor condition with HI range between 5 and 7.5 can't be ruled out adding to increased replacement volumes.

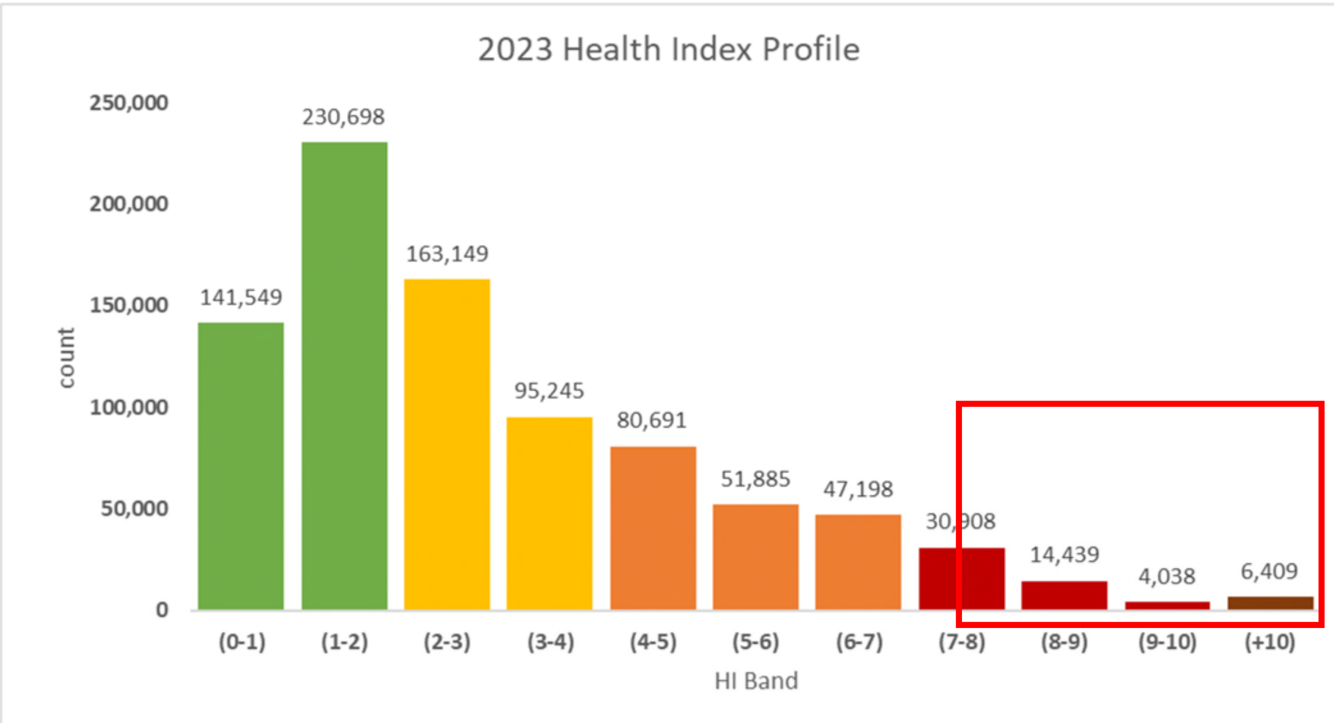

Figure 12: Current HI profile for Wood Poles

Additionally, estimated forecast HI summary of poles at the end of the modelling period (year 2043), as per CBRM, is provided in Figure 13, indicating 264,958 poles exceeding the HI of 7.5, which means an average minimum replacement rate of around 13,250 poles/year, would be required in next 20 years to keep the fleet in acceptable condition. Additional pole replacement could be added to replacement / nailing requirements due to defect identifications in poor condition population.

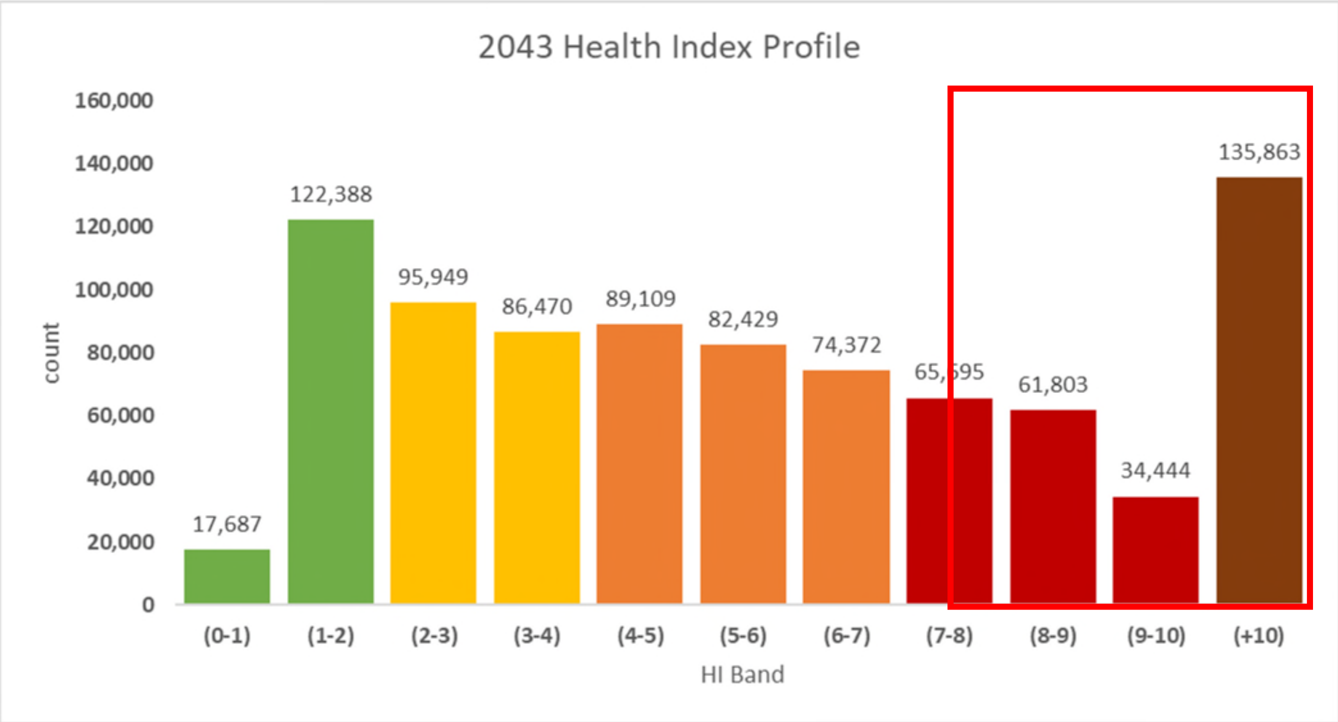

Figure 13: Future HI profile for Wood Poles

4.2 Consequence of Failure (CoF) and Likelihood of Consequence (LoC)

The key consequence of pole failures that have been modelled are reliability, financial, safety and environmental. The CoF refers to the financial or economic outcomes if an event were to occur.

The LoC refers to the probability of a particular outcome or result occurring because of a given event or action. To estimate the LoC, Ergon Energy has utilised a combination of historical performances and researched results. Ergon Energy has analysed past events, incidents, and data to identify patterns and trends that can provide insights into the likelihood of similar outcomes occurring in the future. Additionally, Ergon Energy also has conducted extensive research to gather relevant information and data related to the respective risk criteria such as bushfire.

To the extent possible the CoF and LoC are pole specific. This is particularly the case for the reliability and benefits stream, where the site-specific load and bushfire risk informs the benefits calculations for preventing unassisted pole failures.

4.2.1 Reliability

Reliability represents the unserved energy cost to customers of network outages and is based on an assessment of the amount of Load at Risk during three stages of failure: fault, initial switching, and repair time. The following assumptions are used in developing the risk cost outcome for a pole failure:

- **Lost load:** Each pole in our network is modelled individually, with the relationship developed between a pole and the feeder that it is connected to. The historical average load on each feeder in our network is utilised to determine the kW that would on average be lost following a pole failure. We have utilised half of the historic average load on the feeder, which represents the most likely outcome, as the data regarding the exact electrical location of the pole in a feeder is not available.
- **Load transfers and Restoration timeframe:** the average loss of supply has been estimated for a period of average 6 hours to 24 hours based on the locality, with respective staged restoration periods, based on historical data for outages/durations. This is based on the average load on our fleet of feeders, divided under five categories from ‘Rural Short, rural long, urban, sub-transmission and transmission in between.
- **Value of Customer Reliability Rate:** We have used the Queensland average VCR rate.
- **Probability of Consequence:** all in-service pole failures result in an outage to customers.

4.2.2 Financial

Financial cost of failure is derived from an assessment of the likely replacement costs incurred by the failure of the asset, which is replaced under emergency. The following assumptions have been used in developing the financial risk costs for a pole failure:

- **Pole replacement:** different unit cost of pole replacement has been taken based on voltage level and type of pole varying approximately between $5,400 (LV Pole) to $11,550 (sub-transmission).
- **Pole Reinforcement:** Unit cost of pole reinforcement (nailing) has been taken as $1,843 per pole.
- **Pole Nailing:** has been assumed as 30% of total pole remediation program (Replacement + Reinforcement) for modelling purposes.
- **Probability of Consequence:** all in-service pole failures result in a need to replace the pole under emergency.

4.2.3 Safety

The safety risk for a pole failure is primarily that a member of the public is in the presence of a fallen conductor which was caused by pole failure. This could result in a fatality or injury. For our modelling we have used October 2023 published document from Australian Government, Department of the Prime Minister and Cabinet (Office of Best Practice Regulation) – Best Practice Regulation Guidance Note - Value of a Statistical Life:

- **Value of a Statistical Life:** $5.4m
- **Value of an Injury:** $1.35m
- **Disproportionality Factor:** 6 for members of the public
- **Probability of Consequence**: Following an unassisted pole failure, there is a 1 in 20 years chance of causing a fatality and 3 in 20 years chance of a serious injury based on historical data evidence. The average number of safety incidents has been derived by analysing 20 years of Significant Electrical Incident data comprising 4 incidents where unassisted pole failure has driven a safety incident of the appropriate severity.

4.2.4 Environmental - Bushfire

The value of a Bushfire Event consists of the safety cost of a fatalities and the material cost of property damage following a failed pole causing downed conductor and fire. For our modelling we have used:

- **Value of Bushfire:** $22.3m – which includes average damage to housing and fatalities following a bushfire being started. In Queensland *as per* Australian major natural Disasters.xlsx (a compendium of various sources), there were 122 homes lost and 309 buildings lost during bushfires between 1990 and present (2021) across 12 significant fire records. Homes were estimated an average cost of $400,000 while the buildings were estimated at an average cost of $80,000. The weighted average cost of bushfire consequence per pole has been estimated as $6,765.
- **Safety Consequence of bushfire:** Safety consequences are evaluated on same assumptions as safety incident consequence in 4.2.3 with a frequency of 0.5 per incident as there has been 6 fatalities recorded across those 12 bushfire incidents in Queensland.
- **Probability of Consequence:** Following the failure of a pole, we have estimated that there is a 0.0260 chance of causing a fire. This is based on a historical full year when there were 22 fires recorded due to electrical asset failures in Ergon Energy. In that year there were 114 pole failures, 265 cross-arm failures and 467 conductor failures that had potential to cause fire ignition, giving a probability of 0.0260 (22/846). Also, bushfire consequence weighting and probability of containing/non-containing the fire has been incorporated into calculations along with % number of days considerations during no-forecast to extreme/catastrophic danger rating forecasts.

5 CONSEQUENTIAL REPLACEMENT

Following the identification of a defective pole, we also conduct an evaluation of the condition of the equipment affixed to the pole and determine whether it is feasible and cost-effective to replace them. This equipment encompasses crossarms, transformers, service lines, and switches. Refer to Table 4 in Section 5.1 for further details on benefit assumptions.

In the cost-benefit analysis, we consider the replacement of these equipment as an integral part of pole replacement. Hence, we have included the investments and benefits associated with these consequential replacements into the analysis to ensure that the overall replacement costs and benefits are factored into the modelling.

Table 2 provides the estimated consequential asset volume, based on three years average delivered during last three years, to be replaced under forecast pole replacement program.

Consequential Replacement Volume	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Pole Top	9,594	9,594	9,594	9,594	9,594	**47,970**
Services	4,046	4,046	4,046	4,046	4,046	**20,230**
Pole Transformer	452	452	452	452	452	**2,261**
Switch	378	378	378	378	378	**1,891**

Table 2: Consequential Replacement – Counterfactual Option

In undertaking a comparison between the alternative options to our actual delivery, we have utilised the same ratios of replacement of the items listed in Table 2. Accordingly, a ratio table has been used as summarised in Table 3 to determine the volumes for other options.

Consequential Replacement Ratio	
Pole Top Structure	0.78
Services	0.33
Pole Transformer	0.04
Switches	0.03

Table 3: Consequential Replacement Ratio Per Pole

5.1 Benefit Assumptions

In accounting for the costs and benefits from the consequential of replacement of switchgear, pole top structure and transformer and services with replacement of a defective pole, we have utilised our cost benefit modelling outlined in the business case for each of these four asset categories.

We acknowledged that the consequential replacement of the four asset categories is an “advancement” or brought forward of the replacement of the assets than would otherwise be required later. An estimate of the already used service life of these assets at the time the replacement is provided in Table 4.

Consequential Replacement Asset Description	Average Failure age in Years as per Weibull Analysis	Estimated Average Age at the time of pole replacement (at 58 years)	% Life already used at pole replacement time
Pole Top Structure	41.5	16.5	40%
Services	37	21	57%
Pole Transformer	33	25	76%
Switches	21	16	76%

Table 4: Expected Used Life of Consequential Replacement

Consequential replacements of pole top structures are estimated to be replaced with only 40% of their life used; the asset providing least benefit from replacement as 60% life is still unused. Similarly, services are replaced with 57% of their life used while transformers and switches provide maximum benefits being replaced with 76% of their life used. However, our conservative approach is to assume that all the consequential assets are replaced at 75% of remaining life. On that basis, we allocate 25% of the benefits as identified in the business case for these consequential assets. This is likely to understate the benefits that our customers will see from these consequential replacements.

The following are assumptions used in the analysis of NPV of consequential replacements:

- Estimated average age of pole at the time of replacement is 58 years
- Allocate 25% of the average benefit of replacement of these assets as the benefits attributable to replacing these assets with our defective poles.

Consequential benefits only applicable to pole replacement and not for pole reinforcements.

Additionally, fuse replacements are required during distribution transformer replacements. While there are additional costs associated with fuse replacements, there are no additional benefits. As all the options will have a similar cost impact, fuse replacement costs have been excluded from the NPV analysis.

6 IDENTIFIED NEED

6.1 Problem Statement

From 2015 onwards, Ergon Energy experienced an increasing level of unassisted pole failures. As a result, we reviewed our asset management practices with respect to poles. Following the extensive analysis undertaken through this review, it was identified that our serviceability calculation needed to be changed to better reflect the likelihood of our poles failing in-service. It also identified a need to change our inspection frequency to five years. This has resulted in an increased rate of pole defects being identified through our inspection and maintenance process, resulting in an increase in pole replacements.

This business case evaluates the proposed level of replacement/reinforcement and evaluates the benefits to customers from these replacements/reinforcements. Other options that are practically feasible are also identified and benefits evaluated and compared to demonstrate the prudency of our approach.

The purpose of this business case is to ensure that we deliver the maximum benefits to customers through ensuring the right level of investment forecast to manage the reliability, safety, environmental and financial risks from pole failures.

Pole Stays are an important part of the mechanical support system for poles and structures, used to balance the forces imposed at the top of a pole or structure. Stay systems typically consist of conductor that is tied to buried steel screw anchors, wooden bed logs (now obsolete) or concrete blocks. These systems may also include a dedicated stay or bollard pole.

Failure of the stay cable or rod can result in the pole falling or leaning, impacting energised conductor heights. Over time, stay rods have corroded below ground and the legacy hardwood bed logs have deteriorated and rotted, reducing their foundational strength. There is no practical way to detect this below ground degradation. Analysis has shown that deterioration visible at and above groundline is not always a reliable indicator of below-ground condition.

Stay replacement is typically undertaken based on the standards defined in the Lines Defect Classification Manual or in association with pole replacement works. Stays may be proactively replaced where criteria indicating assets are either at or end of life can be identified. As the stays are not a uniquely identified assets, in the RIN profile, as per the historical apportionment, the expenditure for this investment is integrated into distribution asset investments.

6.2 Compliance

Pole assets are subject to several legislative and regulatory standards. The Asset Management Plan provides the full list; some of the key regulations are:

The Electrical Safety Act 2002 (Qld) s29 imposes a specific duty of care on a prescribed Electrical Entity to ensure that its works:

- are electrically safe
- are operated in a way that is electrically safe.

The duty includes the requirement that the electricity entity inspects, tests, and maintains the works.

The Electrical Safety Regulation 2013 (ESR) details requirements for electric lines, specifically about safety clearances, of which poles are classed as associated equipment. These include various general obligations related to the safety of works of an electrical entity.

The Queensland Electrical Safety Codes of Practice (ESCOP) 2020 – Works details some requirements for maintenance of supporting structures for lines. This document details expectations for supporting structure (poles) reliability, serviceability, and frequency of inspection, as well as timeframes to respond to unserviceable poles, and pole records to be kept.

Some key relevant clauses used to guide the programs are:

- ESCOP s5.1 – must achieve a minimum three-year moving average reliability of 1:10,000pole failure per annum.
- ESCOP s5.2.1 – each pole should be inspected at intervals deemed appropriate by the entity. In the absence of documented knowledge of pole performance, poles should be inspected at least every five years.
- ESCOP s5.3.4 – A suspect pole must be assessed within three months; An unserviceable pole must be replaced or reinstated within 6 months.

Based on our pole population, our Asset Management Plan states that the pole failures must be limited to the order of 97 per annum to conform to the legislative performance targets. The historical unassisted catastrophic pole failure data, three year moving average and ESCOP limit has been shown in Figure 14.

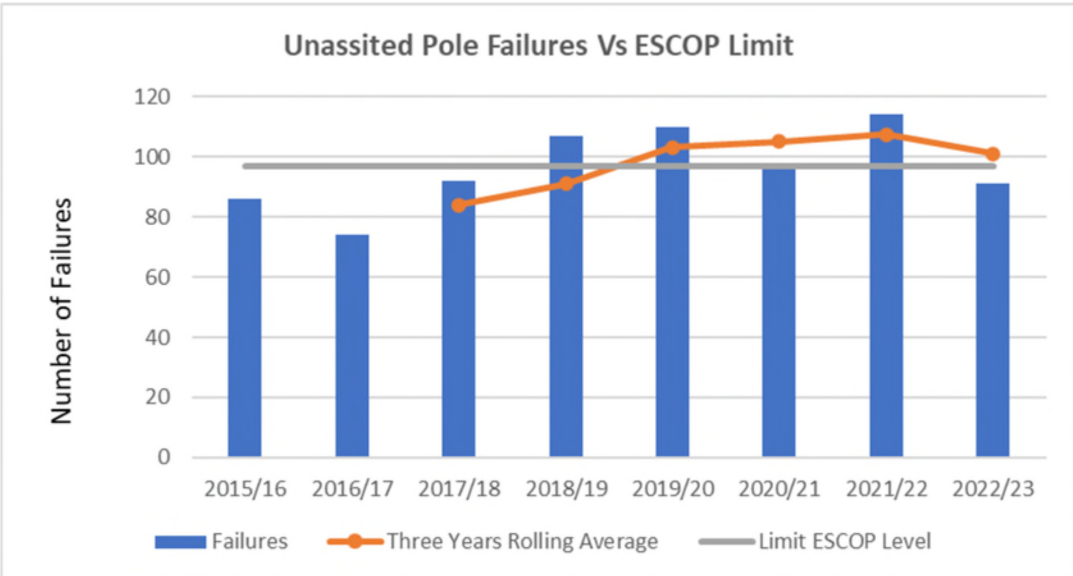

Figure 14: Unassisted Pole Failures vs ESCOP Level

Whilst the three-year rolling average illustrates an upward trend, the trendline in Figure 14 demonstrates that the unassisted pole failures appear to be flattening off. While the reliability performance for poles has a regulatory standard set via the Queensland Electrical Safety Codes of Practice (ESCOP) 2020 – Works, occurrence of in-service pole failure in urban areas has much higher associated risk, due to the higher likelihood of public presence. The desired level of service for poles in the Energy Queensland network is to achieve in-service pole failure numbers which deliver a safety risk outcome which is considered SFAIRP, and as a minimum, maintains current performance standards.

6.3 Counterfactual (Base Case Scenario) – Historical Volumes – Preferred Proposed Option

To provide a comparison of the potential alternatives to our actual delivery for our cost benefit analysis, we have set the counterfactual to our historical volumes for pole replacement/reinforcement program based on average delivered volumes for last three years.

Replacing / reinforcing defective poles using the pole serviceability calculation from inspection driven defect identification is the counterfactual approach.

6.3.1 Costs/Volumes

The estimated volume and expenditure in this option are shown in the Table 5 and Table 6.

Counterfactual Volume Pole and Consequential Replacement	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Pole Replacement & Reinforcement	**16,622**	**16,622**	**16,622**	**16,622**	**16,622**	**83,110**
Pole Replacement	11,964	11,964	11,964	11,964	11,964	**59,820**
Pole Reinforcement	4,658	4,658	4,658	4,658	4,658	**23,290**
Pole Top (Consequential)	9,594	9,594	9,594	9,594	9,594	**47,970**
Services (Consequential)	4,046	4,046	4,046	4,046	4,046	**20,230**
Pole Transformer (Consequential)	452	452	452	452	452	**2,261**
Switch (Consequential)	378	378	378	378	378	**1,891**

Table 5: Counterfactual Option – Volumes

Counterfactual Expenditure Pole and Consequential Direct Expenditure	2025-26 $m	2026-27 $m	2027-28 $m	2028-29 $m	2029-30 $m	Total $m
Pole Replacement	**74.6**	**74.6**	**74.6**	**74.6**	**74.6**	**373**
Pole Reinforcement	**8.4**	**8.4**	**8.4**	**8.4**	**8.4**	**42**
Pole Top (Consequential)	27	27	27	27	27	**135**
Services (Consequential)	5.4	5.4	5.4	5.4	5.4	**27**
Pole Transformer (Consequential)	13.2	13.2	13.2	13.2	13.2	**66**
Switch (Consequential)	3.6	3.6	3.6	3.6	3.6	**18**
Consequential Total	**49.2**	**49.2**	**49.2**	**49.2**	**49.2**	**246**

Table 6: Counterfactual Option – Costs

6.3.2 Risk Quantification

Utilising the modelling approach outlined in Section 4.2, Ergon Energy has determined the risk values for a twenty-year time horizon as a period representative of the expected period of realisable benefits from any interventions. The forecast for pole failures under this scenario shown in Figure 15.

In this option, our modelling shows that unassisted pole failures are projected to be reduced compared to the current levels during the regulatory period 2025-30. This option is the most effective choice for moving towards lowering the failure rate to below ESCOP standards and maximizing customer benefits.

This option transitions towards ESCOP standards at a gradual pace, it's essential to maintain the same level of investment in the future as a minimum to continue improving customer benefits and avoid the need for a significant increase in near-term investments.

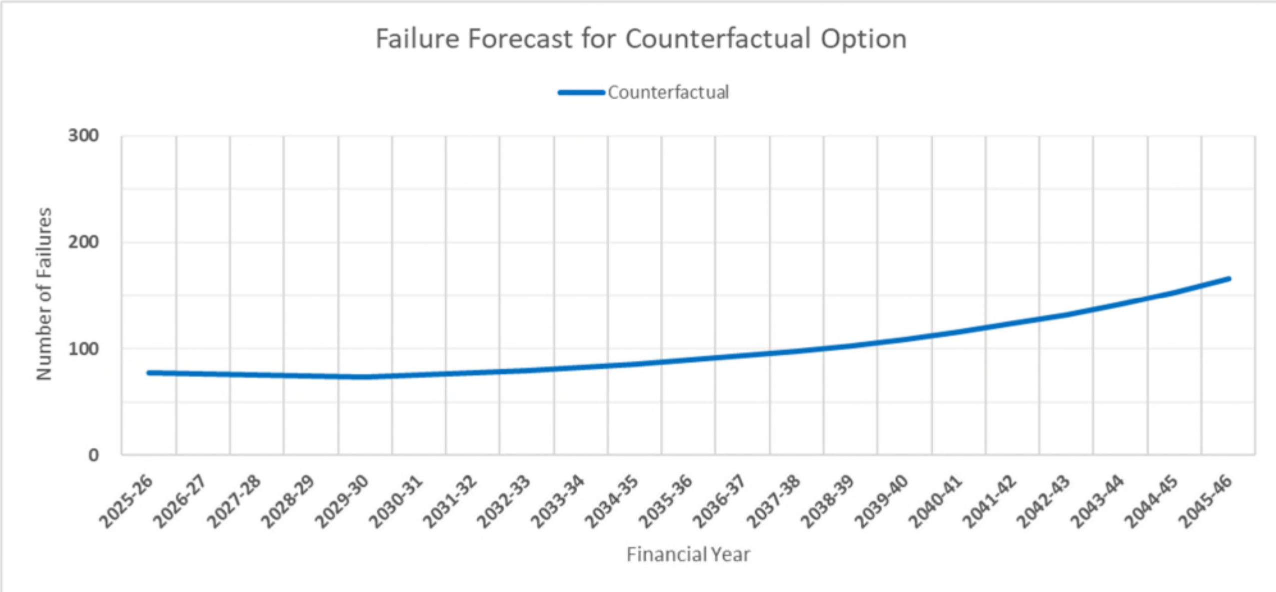

Figure 15: Projected Pole Failures

Figure 16 provides the results of a quantitative forecast of emerging risk associated with Ergon Energy pole asset population failure due to condition related failure modes. The forecast summary indicates that the emerging risk remain constant or reduces marginally during the regulatory period 2025-30 at current level. The modelling suggests that beyond 2030, increase replacement volumes will be required to manage the growing risk.

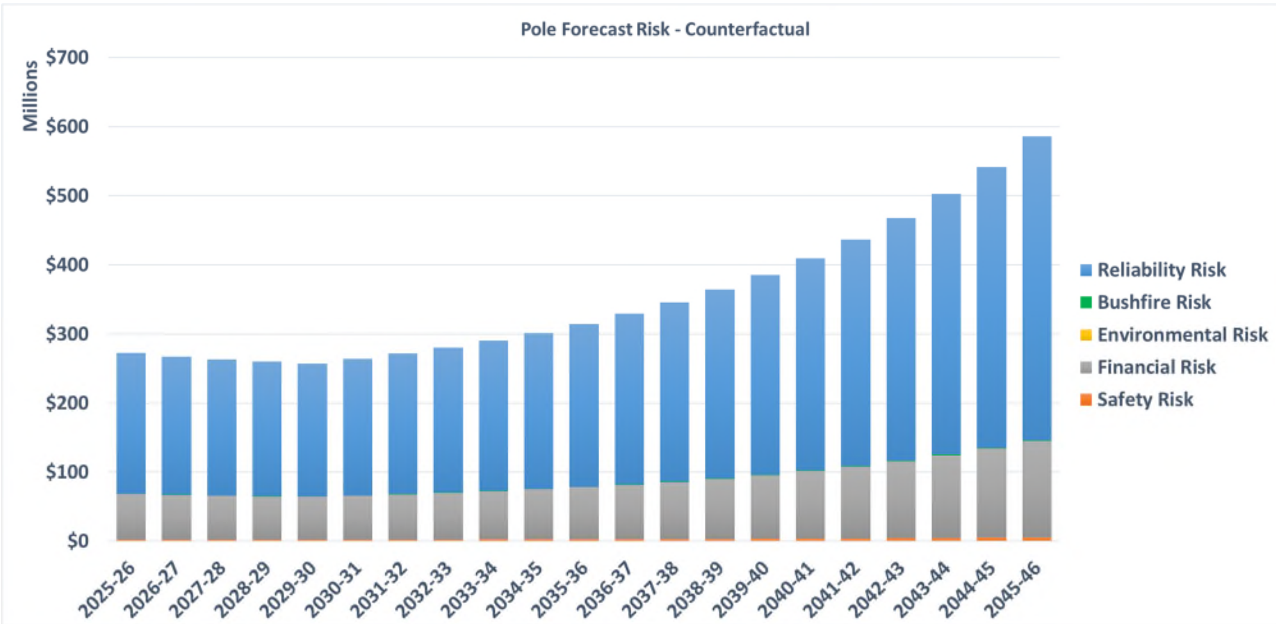

Figure 16: Counterfactual quantitative risk assessment

7 OPTIONS ANALYSIS

In assessing the prudency and efficiency of our actual delivery, we have compared a range of interventions against the counterfactual (Business as usual based on historical average) to assess the options that would have maximised value to our customers. We have sought to identify a practicable range of technically feasible, alternative options that would have satisfied the network requirements in a timely and efficient manner.

It is notable that fuse replacements are required during distribution transformer replacements. While there are additional costs associated with fuse replacements, there are no additional benefits. As all the options will have a similar cost impact, fuse replacement costs have been excluded from the NPV analysis.

7.1 Option 1 – REPEX Model Cost Scenario

This option includes the prioritised replacement/reinforcement for poles based on REPEX model cost scenario with volumes estimated using pole allowance expenditure between 2025-30 divided by average actual unit cost.

7.1.1 Intervention Volume

The volumes that have been modelled in Option 1 are outlined in Table 7.

Historical Volume Pole and Consequential Replacement	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Pole Replacement & Reinforcement	**10,414**	**10,414**	**10,414**	**10,414**	**10,414**	**52,070**
Pole Replacement	7,498	7,498	7,498	7,498	7,498	37,490
Pole Reinforcement	2,916	, 2.916	2.916	2.916	2.916	14,580
Pole Top (Consequential)	5,845	5,845	5,845	5,845	5,845	29,225
Services (Consequential)	2,465	2,465	2,465	2,465	2,465	12,325
Pole Transformer (Consequential)	275	275	275	275	275	1,375
Fuse (Consequential)	550	550	550	550	550	2,750
Switch (Consequential)	230	230	230	230	230	1,150

Table 7: Replacement Volume

7.1.2 Risks/Benefits

In this option, our modelling shows that the unassisted pole failures are projected to increase substantially compared to the counterfactual option. Similarly, this level of performance does not reduce our failure rate below ESCOP standards or maximise customer benefits. Furthermore, opting for this approach will result in a growing need for substantial investment in the near term due to the escalating rate of asset failures. Leaving a larg volume of defective poles in active service will cause a flow on effect of investment requirements and poor asset performance.

7.2 Option 2 – Health Index Based Replacement (HI > 7.5)

This option is a proactive replacement of all poles assessed with HI over 7.5. It's important to mention that the model's estimated volume is lower than the proposed counterfactual option because the model cannot account for the influence of factors such as termite infestation damage and the spread of timber rot.

7.2.1 Intervention Volume

The volumes that have been modelled in Option 2 are outlined in Table 8.

Health Index Based Volume **Pole and Consequential Replacement**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**	**Total**
Pole Replacement & Reinforcement	**13,250**	**13,250**	**13,250**	**13,250**	**13,250**	**66,250**
Pole Replacement	9,540	9,540	9,540	9,540	9,540	47,700
Pole Reinforcement	3,710	3,710	3,710	3,710	3,710	18,550
Pole Top (Consequential)	7,437	7,437	7,437	7,437	7,437	37,185
Services (Consequential)	3,136	3,136	3,136	3,136	3,136	15,680
Pole Transformer (Consequential)	350	350	350	350	350	1,750
Fuse (Consequential)	700	700	700	700	700	3,500
Switch (Consequential)	293	293	293	293	293	1,465

Table 8: Replacement Volume

7.2.2 Risks/Benefits

Under this approach, our modelling predicts that the occurrence of unassisted pole failures will increase in comparison to the counterfactual option. This option will be slower in providing risk mitigation in terms of safety and reliability. Furthermore, opting for this approach will result in a growing need for higher investment in long term due to the escalating rate of asset failures.

7.3 Option 3 – AER REPEX Model Lives Scenario

This option volume is based on REPEX model lives scenario output, includes prioritised replacement of all the oldest poles in the network over 76 years old with reinforcement of poles at an appropriate time to achieve a service life of 76 years. We have estimated volumes for this option using pole allowance expenditure between 2025-30 divided by average actual unit cost.

7.3.1 Intervention Volume

The volumes that have been modelled in Option 3 are outlined in Table 9.

Repex Model Live Scenario Volume Pole and Consequential Replacement	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Pole Replacement & Reinforcement	**5,745**	**5,745**	**5,745**	**5,745**	**5,745**	**28,745**
Pole Replacement	4,136	4,136	4,136	4,136	4,136	20,680
Pole Reinforcement	1,609	1,609	1,609	1,609	1,609	8,045
Pole Top (Consequential)	3,224	3,224	3,224	3,224	3,224	16,120
Services (Consequential)	1,360	1,360	1,360	1,360	1,360	6,800
Pole Transformer (Consequential)	152	152	152	152	152	760
Fuse (Consequential)	304	304	304	304	304	1,520
Switch (Consequential)	127	127	127	127	127	635

Table 9: Replacement Volume

7.3.2 Risks/Benefits

Under this option, our modelling indicates that unassisted pole failures are expected to be significantly higher compared to the counterfactual option. The level of performance is worst among all options and will not reduce the failure rate below ESCOP standards or maximise customer benefits.

Additionally, our failure recent failure and defect analysis shows that treated poles are not achieving the same level of lifespan as untreated poles. Treated poles are the majority of our population and are failing mainly due to timber integrity issues from faster growing timber. Moving to an aged-based replacement philosophy may not result in a significant lowering of unassisted pole failures given our pole failures are not directly related to the age of the poles. Recent failure and defect analyses have also confirmed this issue. Therefore, choosing this approach will necessitate a significant increase in near-term investments due to the rising rate of asset failures and is not an acceptable option for Ergon Energy.

7.4 Option 4 – Additional Targeted Replacements

This option includes additional replacement of 2000 poles proactively including corrective replacement of all the poles identified as unserviceable (counterfactual).

7.4.1 Intervention Volumes

The volumes that have been modelled in Option 4 are outlined in Table 10.

Additional Targeted Volume Pole and Consequential Replacement	2025-26	2026-27	2027-28	2028-29	2029-30	Total
Pole Replacement & Reinforcement	**18,622**	**18,622**	**18,622**	**18,622**	**18,622**	**93,110**
Pole Replacement	13,408	13,408	13,408	13,408	13,408	67, 040
Pole Reinforcement	5,214	5,214	5,214	5,214	5,214	26,070
Pole Top (Consequential)	10,452	10,452	10,452	10,452	10,452	52,260
Services (Consequential)	4,408	4,408	4,408	4,408	4,408	22,040
Pole Transformer (Consequential)	493	493	493	493	493	2,165
Fuse (Consequential)	996	996	996	996	996	4,480
Switch (Consequential)	412	412	412	412	412	2,060

Table 10: Replacement Volume

7.4.2 Risks/Benefits

In this option, our modelling shows that unassisted pole failures are projected to be reduced substantially compared to the counterfactual option. This option is the good effective choice for moving towards lowering the failure rate below ESCOP standards and maximizing customer benefits but involves additional cost impact on customers.

8 OUTCOMES OF OPTIONS ANALYSIS

8.1 Pole Failure Forecast

The pole failure rate forecast for all the main options have been provided in the Figure 17.

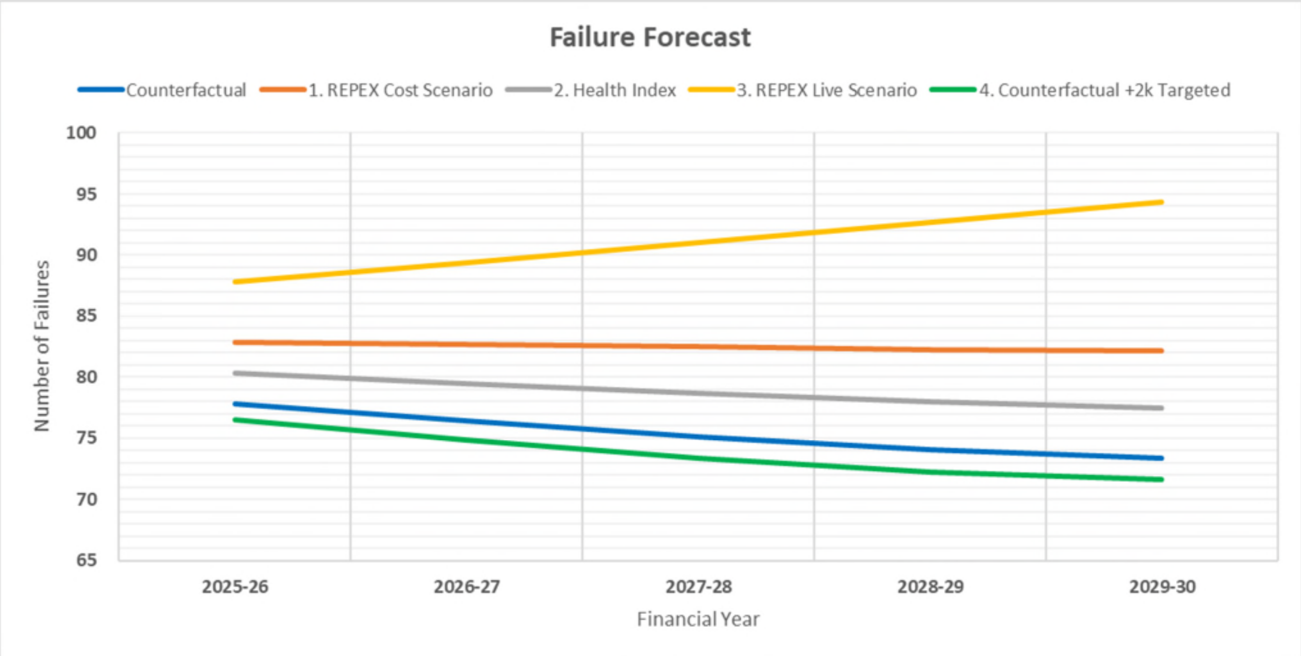

Figure 17: Failure Forecast - Intervention options

The proposed counterfactual option and option 4 are the only options with positive NPV which forecast reduction in failure rate to comply with ESCOP levels. However, option 4 requires additional investment offsetting the risk reduction and community benefits up to some extent.

Counterfactual approach delivers the maximum community benefits with reduction in failure and public safety with reasonable investment and therefore has been proposed for regulatory period 2025-30.

Other three options 1 and 3 does not provide adequate risk reduction for community but forecast further increase in long term (20-year modelling) causing concerning level of failures.

8.2 Economic Analysis

The NPV of cost benefit analysis of the options is summarised in Table 11 with volume summary provided in Table 12, which demonstrates the following:

- Option Counterfactual – has been set for zero NPV but indicating the best balance of benefits to customers and failure reductions with no additional cost impact.
- No other option provides a positive NPV except Option 4.

An increased volume of replacements in Option 4, as per Volume Summary Table 12, would deliver even higher customer benefit values with positive NPV, however this would have an impact on the resource and service cost to the customers.

Base Case including CCPEX							
NPV Analysis to Counterfactual							
		Rank	Net NPV incl CCPEX	CAPEX (NPV)	Benefit (NPV)	CCPEX NPV	CCPEX Benefits NPV
	Counterfactual	2	0	0	0	$0	$0
Option 1	REPEX Cost Scenario	4	-$699,389,415	$226,770,628	-$950,851,997	$61,557,783	-$36,865,830
Option 2	Health Index	3	-$345,697,301	$120,205,727	-$479,418,551	$33,490,773	-$19,975,249
Option 3	REPEX Live Scenario	5	-$1,946,537,852	$393,188,842	-$2,382,748,191	$107,741,094	-$64,719,596
Option 4	Counterfactual +2k Targeted	1	$128,324,603	-$75,432,659	$211,629,380	-$19,813,748	$11,941,631

Table 11: NPV Modelling Outcomes for all Options

Replacement Volumes						
		2025-26	2026-27	2027-28	2028-29	2029-30
	Counterfactual	16,622	16,622	16,622	16,622	16,622
Option 1	REPEX Cost Scenario	10,413	10,413	10,413	10,413	10,413
Option 2	Health Index	13,250	13,250	13,250	13,250	13,250
Option 3	REPEX Live Scenario	5,745	5,745	5,745	5,745	5,745
Option 4	Counterfactual +2k Targeted	18,622	18,622	18,622	18,622	18,622

Table 12: Volume Summary – All Options

Table 13 shows the additional consequential NPV benefits for the various intervention options due to cross arm, services, switches and distribution transformers replacements in conjunction with pole replacements program. These assets replacement concurrently is considered efficient from a delivery perspective.

NPV Analysis to Counterfactual				Pole		Consequential (25% Benefit Factor)		
Options		Rank	Net NPV incl CCPEX	CAPEX (NPV)	Benefit (NPV)	Pole Attached Assets	CCPEX NPV	CCPEX Benefits NPV
Counterfactual		**2**	**$0**	**$0**	**$0**		**$0**	**$0**
						Pole Top	$0	$0
						Services	$0	$0
						Pole Top Transformer	$0	$0
						Switches	$0	$0
Option 1	**REPEX Cost Scenario**	**4**	**-$699,389,415**	**$226,770,628**	**-$950,851,997**		**$61,557,783**	**-$36,865,830**
						Pole Top	$26,857,775	-$27,766,254
						Services	$8,801,907	-$3,508,302
						Pole Top Transformer	$19,747,560	-$2,725,314
						Switches	$6,150,541	-$2,865,960
Option 2	**Health Index**	**3**	**-$345,697,301**	**$120,205,727**	**-$479,418,551**		**$33,490,773**	**-$19,975,249**
						Pole Top	$14,593,662	-$15,074,268
						Services	$4,780,994	-$1,904,650
						Pole Top Transformer	$10,775,342	-$1,440,574
						Switches	$3,340,776	-$1,555,758
Option 3	**REPEX Live Scenario**	**5**	**-$1,946,537,852**	**$393,188,842**	**-$2,382,748,191**		**$107,741,094**	**-$64,719,596**
						Pole Top	$47,029,003	-$48,686,484
						Services	$15,421,094	-$6,151,625
						Pole Top Transformer	$34,515,955	-$4,853,992
						Switches	$10,775,042	-$5,027,495
Option 4	**Counterfactual +2k Targeted**	**1**	**$128,324,603**	**-$75,432,659**	**$211,629,380**		**-$19,813,748**	**$11,941,631**
						Pole Top	-$8,662,173	$8,932,179
						Services	-$2,835,822	$1,128,587
						Pole Top Transformer	-$6,334,231	$959,524
						Switches	-$1,981,522	$921,341

Table 13: NPV Modelling Outcome for all Options including Consequential Benefits

Outcomes of our modelling confirms the following:

- Options with a lower replacement volume than counterfactual option resulted in a negative NPV
- While Option 4 (additional targeted volume) will also deliver higher positive NPV, it will require a significant increase in resourcing capability.
- The counterfactual Option provided the optimum solution to achieve network standard compliances and deliver appropriate customer benefits.
- Hence it is prudent to continue with our business as usual pole replacement program.

Figure 18 illustrates the advantages and disadvantages of all options over their counterfactual.

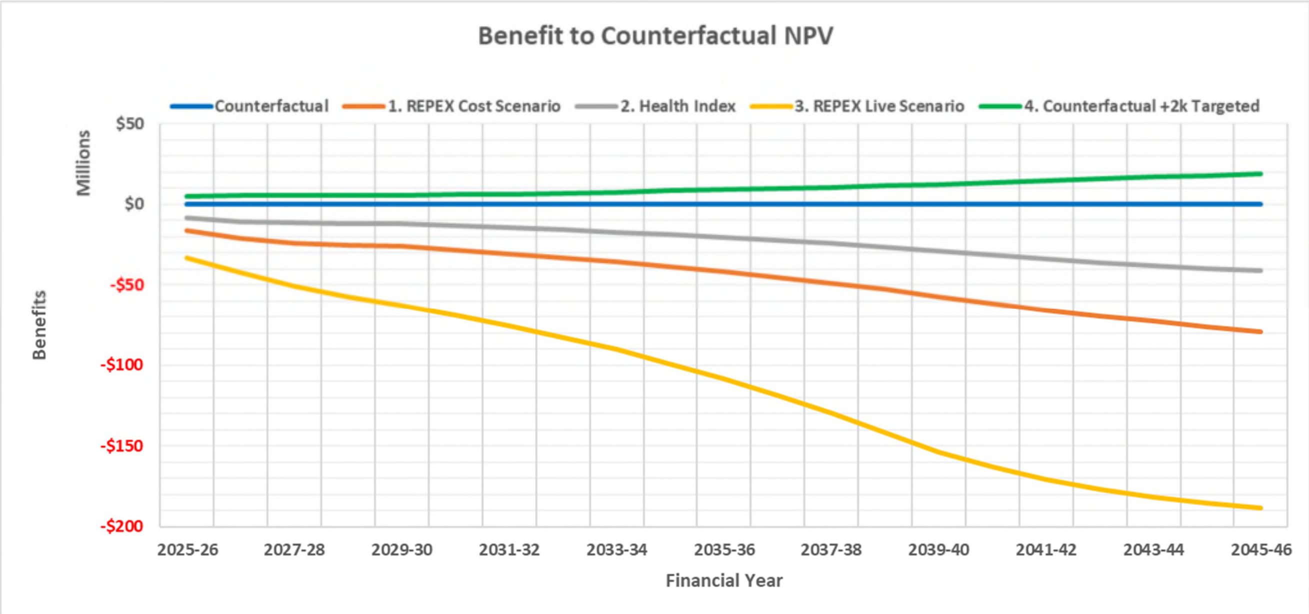

Figure 18: Benefits for All Options

The analysis presented here compares the options to their respective counterfactual **(Preferred Option)** alternatives as per Table 14.

Criteria	Option 1 –Repex Model Cost Scenario	Option 2 – Health Index ≥ 7.5	Option 3 – Repex Model Lives Scenario	Option 4 – Additional Targeted Volume
Net NPV	-$699m	-$346m	-$1,947 m	$128m
Investment Risk	Low	Low	Very Low	High
Benefits	Low	Low	Very Low	High
Delivery Constraint	Low	Low	Very Low	Med
Detailed analysis – Advantage	• Low impact on delivery requirement • Saving of $288m budget • Aligning with Repex model Cost output.	• Removing condition-based asset in advance. • Improvement in failure performance • Low impact on delivery • Savings of $154m.	• Lowest Investment and delivery risks • Do minimum.	• Additional $224m Customer Benefit • Removes all defective assets from the network. • Faster transition towards the improvement in asset performance • Problematic assets can be removed proactively.
Detailed analysis – Disadvantage	• Increased risks for community $988m • Negative NPV • High failure rate • Negative NPV.	• Increased risk for community $499m • Slower transition towards asset performance improvement. • Negative NPV • Need for long term investment.	• Negative NPV • Lowest network performance with significant increase in failures • Elevated risk to the community	• Additional investment of $95m. • Impact on delivery requirement.

Table 14: Option Analysis Score Card

9 SUMMARY

Ergon Energy Network's proposed plan is to continue with the counterfactual (Preferred) volume for the regulatory period of 2025-2030. This proposed plan aligns with our current actual delivery of replacement volumes which has proven to reduce the in-service failures.

We have assessed and modelled four feasible options compared to proposed counterfactual delivery forecast as set out in our Reset RIN period from 2025-26 to 2029-30. To confirm the prudency of out proposed option, we have included the consequential replacements of assets to be undertaken at the time of pole replacements.:

- Options 1,2 and 3 which proposed a lower replacement volume compared to the counterfactual deliver negative NPV benefit and increased risks for our community.
- Option 4 which propose additional volume to the counterfactual will yield further benefit to the customers and yield an NPV positive outcome; However, there is a risk in delivery of such a program due to resourcing constraints.

It is noted that the modelled result for counterfactual shows that pole failure rates are likely to reduce both in short and long terms. Hence, we forecast that the current level of remediation programs as proposed, and this will be the minimum replacement volume for the 2025-30 regulatory control period as well to bring the failure rate below the ESCOP levels.

9.1 Sensitivity Analysis

To further test the effectiveness and prudency of the preferred option, a number of sensitivity analysis criteria have been applied, with ± 25% values, to compare the outcomes of the modelling in different scenario. The main sensitivity criteria are:

- Annual Risk cost
- Weighted Average Capital Cost (WACC)
- Probability of Failure (PoF).

In most of the sensitivity analysis outcomes, the Counterfactual (Preferred Option) has been demonstrated as the most prudent option.

10 RECOMMENDATION

The proposed counterfactual delivery is reflective of our commitment to provide maximum customer benefit at optimised customer price impacts. It reflects a tolerable risk position which balances the achievement of asset management objectives and customer service levels and ensures a level of investment which avoids future consequences based on the uncertainty associated with the capability new technologies may bring.

11 APPENDIX A – REPEX FORECAST – RESET RIN

	2025/26	2026/27	2027/28	2028/29	2029/30
	Expenditure	Expenditure	Expenditure	Expenditure	Expenditure
RIN (All Pole + Nail)	98,819,197	99,497,372	99,949,488	100,401,605	100,627,663
Pole Defect Replacement	74,610,061	74,610,061	74,610,061	74,610,061	74,610,061
Nail	8,384,400	8,384,400	8,384,400	8,384,400	8,384,400
Total Pole Defect	**82,994,461**	**82,994,461**	**82,994,461**	**82,994,461**	**82,994,461**
Reconductor Concequential	13,710,630	14,388,805	14,840,922	15,293,038	15,519,097
Conductor Defect Consequential	2,114,105	2,114,105	2,114,105	2,114,105	2,114,105
Consequential Poletop Replacement	26,963,607	26,963,607	26,963,607	26,963,607	26,963,607
Consequential Services Replacement	5,418,588	5,418,588	5,418,588	5,418,588	5,418,588
Consequential TD Replacement	13,222,494	13,222,494	13,222,494	13,222,494	13,222,494
Consequential Fuse Replacement	9,127,596	9,127,596	9,127,596	9,127,596	9,127,596
Consequential Switch Replacement	3,560,947	3,560,947	3,560,947	3,560,947	3,560,947
Consequential Replacement	**58,293,232**	**58,293,232**	**58,293,232**	**58,293,232**	**58,293,232**
BC Total	**141,287,694**	**141,287,694**	**141,287,694**	**141,287,694**	**141,287,694**

Table 15: Reset RIN – Expenditure $ in 2022-23

$, Direct 2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
	Expenditure	Expenditure	Expenditure	Expenditure	Expenditure
RIN (All Pole + Nail)	112,443,065	113,783,829	114,870,734	115,527,936	116,639,108
Pole Defect Replacement	84,896,298	85,323,042	85,748,438	85,850,683	86,481,696
Nail	9,540,329	9,588,285	9,636,089	9,647,579	9,718,490
Total Pole Defect	**94,436,627**	**94,911,327**	**95,384,527**	**95,498,262**	**96,200,186**
Reconductor Concequential	15,600,868	16,454,840	17,056,491	17,597,061	17,988,429
Conductor Defect Consequential	2,405,570	2,417,662	2,429,716	2,432,613	2,450,493
Consequential Poletop Replacement	30,680,988	30,835,211	30,988,946	31,025,897	31,253,941
Consequential Services Replacement	6,165,631	6,196,623	6,227,518	6,234,943	6,280,771
Consequential TD Replacement	15,045,435	15,121,063	15,196,452	15,214,572	15,326,401
Consequential Fuse Replacement	10,385,987	10,438,193	10,490,235	10,502,744	10,579,940
Consequential Switch Replacement	4,051,883	4,072,250	4,092,553	4,097,433	4,127,550
Consequential Replacement	**66,329,923**	**66,663,341**	**66,995,705**	**67,075,589**	**67,568,603**
BC Total	**160,766,550**	**161,574,668**	**162,380,232**	**162,573,851**	**163,768,789**

Table 16: Reset RIN – Expenditure $ in 2024-25

	2025/26	2026/27	2027/28	2028/29	2029/30
	Replacement Qty	Replacement Qty	Replacement Qty	Replacement Qty	Replacement Qty
RIN (All Pole + Nail)	19,160	19,268	19,341	19,413	19,450
Pole Defect Replacement	11,964	11,964	11,964	11,964	11,964
Nail	4,658	4,658	4,658	4,658	4,658
Total Pole Defect	**16,622**	**16,622**	**16,622**	**16,622**	**16,622**
Reconductor Consequential	2,199	2,307	2,380	2,452	2,489
Conductor Defect Consequential	339	339	339	339	339
Consequential Poletop Replacement	9,594	9,594	9,594	9,594	9,594
Consequential Services Replacement	4,046	4,046	4,046	4,046	4,046
Consequential TD Replacement	452	452	452	452	452
Consequential Fuse Replacement	904	904	904	904	904
Consequential Switch Replacement	378	378	378	378	378

Table 17: Reset RIN – Volumes of Replacement