evoenergy

Appendix 2.2: Poles Business Case

Revised regulatory proposal for the Evoenergy electricity distribution determination 2024 to 2029

November 2023

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1. Business need

This business case has been prepared to support the Evoenergy Electricity Distribution Network Determination 2024–29 (EN24) Revised Regulatory Proposal, principally with respect to the poles capital expenditure (capex) replacement expenditure (repex) program. The business case demonstrates that Evoenergy has undertaken an appropriate analysis of the need for the expenditure and identified credible options that will ensure we continue to meet the National Electricity Objectives and maintain the quality, reliability, and security of electricity supply and safety for customers in the Australian Capital Territory (ACT).

Overhead support structures are used to maintain electrical clearances between live electrical equipment and the ground. This asset class includes unstaked poles, staked poles, towers and their associated cross arms, fittings and hardware. There are approximately 49,127 poles on Evoenergy's distribution and transmission network. Wood poles account for approximately 56 per cent of the pole population. Due to the access difficulties with Canberra's 'backyard reticulation' network topology, Evoenergy has been progressively moving away from installing new wood poles over the past 10–15 years. As a result, longer life concrete and steel poles make up 23 per cent and 12 per cent, respectively, with the remainder comprising poles constructed from fiberglass and composite materials. Most existing wood poles have been reinforced through steel staking to extend their service life and manage the cost of renewal over time. This is reflected in the relatively high average pole population age of 49.27 years.

Evoenergy has been actively managing an aging pole population and mitigating risk through a targeted replacement program. These works have been driven by asset age profiles, condition assessments, and risks related to defects. There are currently around 800 poles that remain in service and are flagged for immediate replacement. Evoenergy has managed this risk through the current 2019–24 regulatory period through inspection and monitoring. However, the ongoing identification of additional defects and condemnations over time means that this high-risk population will continue to grow and place a higher risk on Evoenergy customers if they are not addressed at an appropriate rate through the 2024–29 regulatory period.

In addition to the 800 condemned poles, a further 5,800 poles have been classified as in poor condition, and a further 3000 poles will exceed the age of 55 by the end of the next regulatory period (2024–29). At around 50–60 years is the point at which typical screening tools and the Australian Energy Regulator (AER)'s repex modelling approach indicate a rapidly increasing need for replacement with a commensurate increase in the risk of failure for the remaining older assets. Considering these factors, it is clear that we need to continue to plan renewal investment over multiple regulatory control periods to uphold the health and safety of the distribution network and ensure that resourcing levels can be made available or delivery needs can be managed to address the expected peaks in pole replacement needs over the coming decades.

Alternatively, a more aggressive 'run to failure' strategy will place pressure on the plant, skills and equipment to respond to the more acute 'spikes' in replacement. This is particularly the case, given the much closer proximity of Evoenergy poles to customers and the limited number of lower risk rural service areas, when compared to all other Distribution Network Service Providers (DNSPs).

The consequence of not replacing high risk poles is a functional failure resulting in either pole collapse or excessive leaning, compromising electrical clearances and placing the public at risk. The public (including connected customers) and worker safety issues associated with potential functional failure remain a primary concern. More than 60 per cent of distribution poles are located within residential backyards, meaning that assets in poor condition are seen and perceived by customers to represent a greater and more immediate personal safety risk than equivalent poles otherwise installed on the street in other networks.

Furthermore, backyard reticulated poles that are in poor condition not only present risks to reliability, electricity supply and the environment. Failure to invest in replacement will expose Evoenergy to increased risk and maintenance costs to ensure pole serviceability due to the significant access constraints (compared to street reticulation networks) to maintain, monitor and inspect their condition over time.

In addition to replacing high-risk poles, Evoenergy will also undertake minor transmission hardware replacement and refurbishment tasks. These activities are related to transmission towers' structural refurbishment for galvanisation and paint treatment, removal of asbestos contaminated paint and the end of life of long rod polymeric insulator replacements. These activities enable Evoenergy's approach to managing the existing risks on the network whilst supporting an improved commercial outcome by extending the effective operating life of support structures.

The presence of asbestos contaminated paint on the transmission steel poses a significant health and safety risk and hinders maintenance activities on steel towers. The aging condition of the steel towers in the transmission network has led to the loss of anodic protection and ongoing deterioration of the steel elements. This compromises the structural integrity of the towers and increases the risk of cascaded failure in the transmission lines.

Evoenergy conducted a testing program on a random sample of in-service polymeric long rod insulators after experiencing a brittle failure on two transmission lines between 2017 and 2019. The testing program confirmed that the insulators require a replacement program due to deterioration caused by UV exposure and corona discharge. Evoenergy is considering including corona rings in the replacement program to prevent similar deterioration in this asset type.

The replacement of high-risk poles and the refurbishment of transmission hardware offer the highest return on investment for preventing failures and avoiding the need for whole-line replacements due to cascaded failures. Additionally, they contribute to efficient operation and increased reliability of the network.

1.1 Options analysis

The options considered to resolve this need are shown in Table 1 below.

Table 1 Options descriptions and recommendations

Option	Option name	Description	Recommendation
1	Historical replacement volumes	Proposed pole replacements in accordance with historical volumes.	**Not recommended.** Continuous use of degraded assets until functional failure does not mitigate increasing risk to public and worker safety, reliability and the environment. The historical replacement volumes are lower than is necessary to maintain risk levels on the network due to the increasing volume of older poles and significant volumes of condemned poles that need to be addressed.
2	Revised EN24 repex proposal	Implement a targeted replacement strategy to maintain the current risk profile and evaluate the remainder of the	**Recommended.** This option is considered the most prudent and efficient. It allows for the volume of condemned poles to be managed through the EN24 period (2024–29) while responding to

		higher risk poles for remedial action.	the AER's desire to reduce total repex in its draft determination. This represents a curtailed version of the original EN24 proposal, where Evoenergy has deferred some replacements and will manage the risk through maintenance and monitoring in favour of supporting price relief for its customers in the current inflationary environment.
3	Original EN24 repex proposal	Replacement of the highest high-risk based on condemnation forecasts.	**Not recommended.** Evoenergy's original program is strongly supported in the analysis as the option delivering the highest benefits. However, it has not been proposed in the revised proposal in order to implement strategic reduction of the program to reflect better the AER's draft decision outcome and other competing pressures (cost of living).

A cost benefit analysis (CBA) was completed for each of the options where the risk reduction, compared to Option 1, was used as the benefits achieved by each option.

1.2 Recommendation

As per Table 2, the recommended option is Option 2—a targeted, proactive replacement of the most critical condition wood poles for the 2024–29 regulatory period. It is essential that this program commences, as proposed, to manage the associated risk and ensure the continued safety and reliability of Evoenergy's network.

In total, we expect to spend $32.1 million ($2023/24, excluding corporate overheads)[1] to complete the following works:

- 1,550 distribution timber pole replacements ($27.45 million);
- 50 transmission pole replacements ($1.85 million);
- 200 timber pole reinforcements ($0.65 million); and
- 171 Transmission hardware refurbishment and replacements ($2.1 million).

The recommended option is aligned with Evoenergy's current strategy and asset objectives but also includes a curtailment from our original EN24 proposal to respond to customers and the AER's price impact concerns in the current economic environment. Despite the additional benefits offered by the higher expenditure in Option 3, we have determined that associated risk can be managed adequately through Option 2.

This strategy looks to optimise costs and manage the risk presented through considered capex and opex trade-offs, with a view to lower the total cost of ownership with minimal impact on risk. It also aligns with our customer expectations and Evoenergy's broader duty of care to maintain the safety, reliability and security of their network. Despite the additional benefits offered by Option 3, we can manage the associated risk.

[1] Note, all $ in this appendix are reported on this basis, unless otherwise specified.

Note that all costs and benefit values have been discounted to present values (PV), using the average real vanilla Weighted Average Cost of Capital (WACC) over the 2024–29 regulatory period of 3.13 per cent as the discount rate, as per Evoenergy's proposed Post Tax Revenue Model. The present value of costs and benefits have also been calculated on a 10 year basis, while the capex value is for the 2024–29 regulatory period.

Table 2 Comparison of poles investment options

Comparison criteria	Option 1	Option 2	Option 3
PV cost ($ m, 2023/24)	$25.8	**$30.6**	$40.2
PV benefits ($ m, 2023/24)	$40.6	**$52.5**	$67.7
Benefit Cost Ratio (ratio)	1.57	**1.72**	1.69
NPV ($ m, Real 2023/24)	$14.8	**$21.9**	$27.5
Capex ($ m, 2023/24)	**$25.8**	**$32.1**	**$44.0**

2. Identified need

This section provides the background and context to this business case by identifying the issues that pose the highest risk to the pole network and Evoenergy's customers and describes the current mitigation program.

2.1 Age based screening

Evoenergy has approximately 49,127 poles on the distribution and transmission network, of which 26,623 are timber poles. The focus of the EN24 repex program will be replacing the highest risk timber poles. Given age provides a reasonable lead indicator for condition, noting that the relationship between age and asset performance will continue to be monitored and further calibrated with asset condition through the 2024–29 regulatory period to assess whether a future step change in replacement expenditure is required.

For each asset class, we have considered:

1. the mean replacement age and proportion of the assets approaching the end of life; and
2. the percentage of replacement volumes required to maintain the average replacement life.

The average age of timber poles within the modelled portion of this asset class is 49.27 years. Timber poles represent the largest portion of this asset class, both in population and expenditure. With a population of nearly 27,000 poles, we would need to replace 2.3 per cent of our assets per year (614 poles per year) to maintain the current average age.

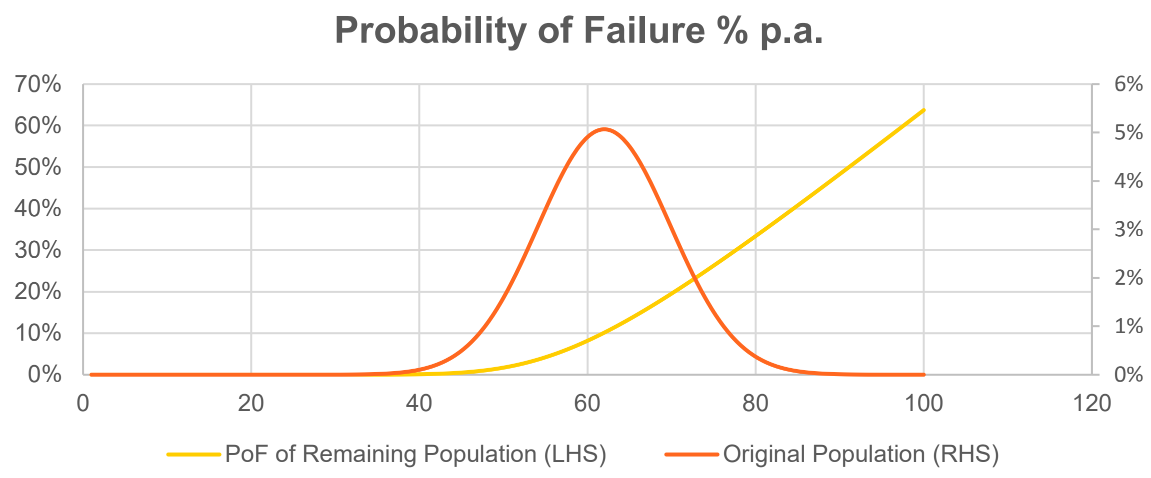
Despite the increasing age profile, our condition-based management approach supports a level of investment that is lower than the age-based 'constant time-based deterioration risk' forecast would suggest. This results from the field inspection and condition reporting of the actual assets in service.

The age profile for this asset class shows approximately 15.3 per cent of timber poles already above the 53 year mean replacement age, increasing to 33.8 per cent at the end of the 2024–29 regulatory period without replacement. Despite this, the forecast average annual failures remain less than 1 per cent of the population per year, allowing to prudently reprioritise some of these replacements where condition issues can be managed with more frequent inspection and maintenance practices in the short term—particularly in locations that are not subject to the higher risk-cost exposure inherent to backyard reticulated network locations.

It is also noted that at the end of the 2024–29 regulatory period, 2173 (4.42 per cent) timber poles will exceed 80 years old, requiring significant investment to manage as they enter the final stages of their remaining useful life.

Figure 1 below shows the assumed probability of failure (PoF) by year peaks at around 5 per cent p.a. for a population with a mean life of 62 years and a standard deviation of 7.87 years (the square root of the mean, in accordance with the AER's default Repex Model assumptions). It also shows the annual PoF for the remaining population in each year when the percentage is rebased to reflect the size of the remaining population (instead of the initial population). In this case, the PoF at the average age of 62 years in the proposed pole replacement program is around 10 per cent per annum and increases rapidly to around 35 per cent per annum for 80 year old poles.

Figure 1 Probability of failure for surviving older poles



Evoenergy notes that the example above is illustrative only but is consistent with reasonable regulatory forecasting methodologies that are embedded in the AER Repex Model.

Given the age profile and spread of aged poles in Evoenergy's population—including poles that have been in service for 96 years—the analysis is not particularly sensitive to the shape of the failure distribution (e.g. Normal, Weibull, Left/Right Skewed or Multimodal) or its spread over time (i.e. wider standard deviation) provided that it can be agreed that typical pole life falls in the range of 50–80 years.

This supports the view that we have been able to successfully manage our pole population in a manner based on condition drivers in a way that maintains reliability and continuity of supply and manages the safety risks posed by our assets. We have a documented history of managing this risk with routine inspections that allow for the timely treatment of defects before asset failure or condemnation.

This information reinforces the favourable customer outcomes from the recent historical management of this asset class, with the population including significant volumes of aged assets that remain in service. The pole age profile of timber poles is presented in Figure 2 and Figure 4.

Distribution network

The timber pole age profile and corresponding condition health index have been presented in Figure 2 and Figure 3.

Figure 2 Distribution pole age profile by asset type

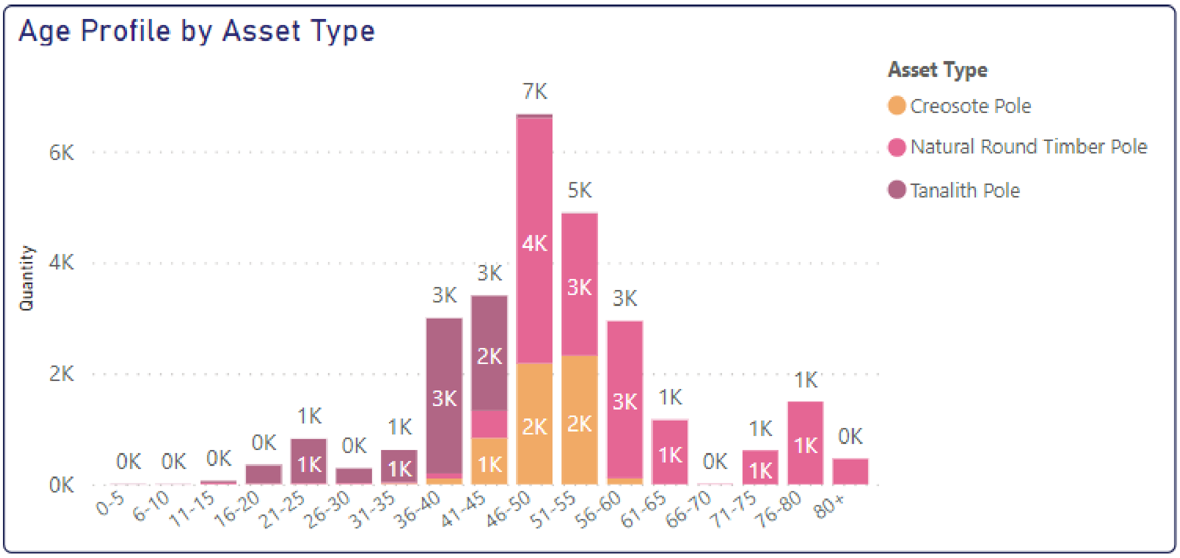
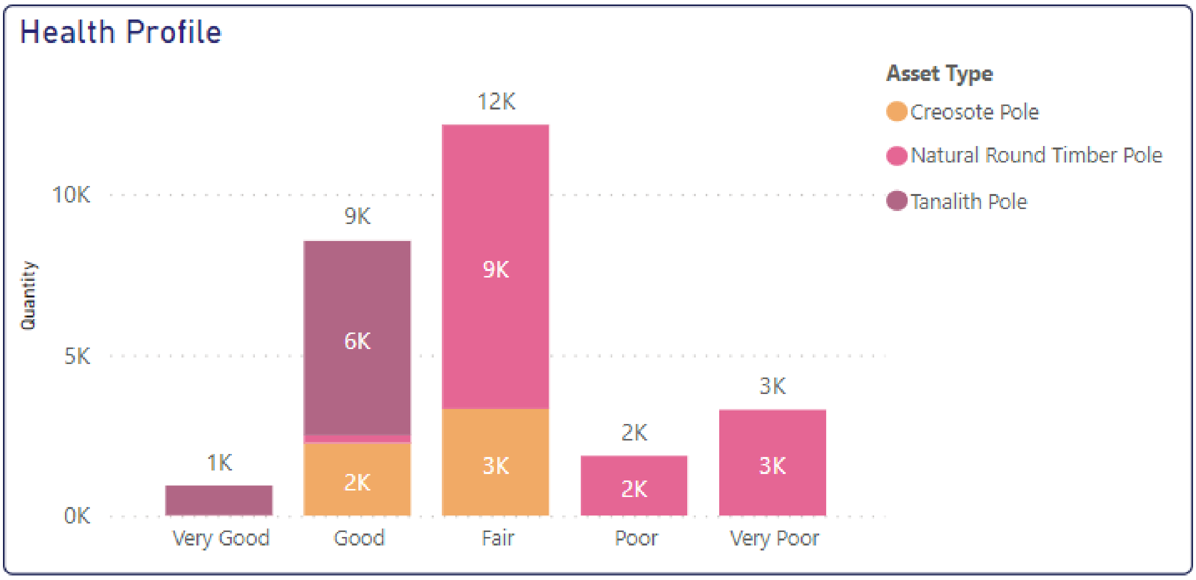


Figure 3 Distribution pole health profile by asset type



Transmission network

The timber pole age profile and corresponding condition health index have been presented in Figure 4 and Figure 5.

Figure 4 Transmission pole age profile by asset type

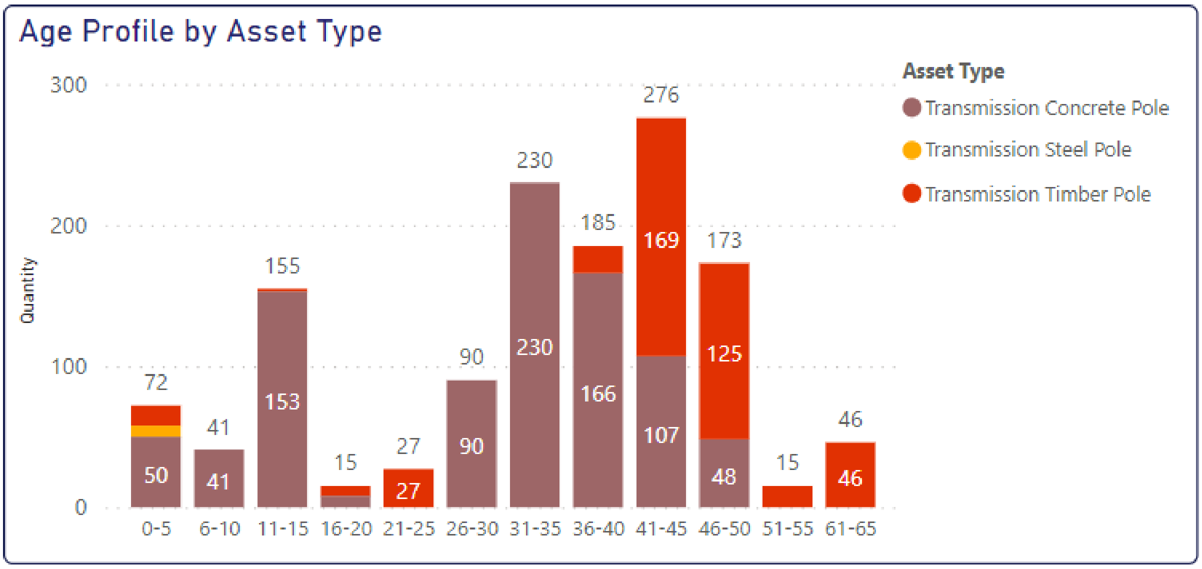
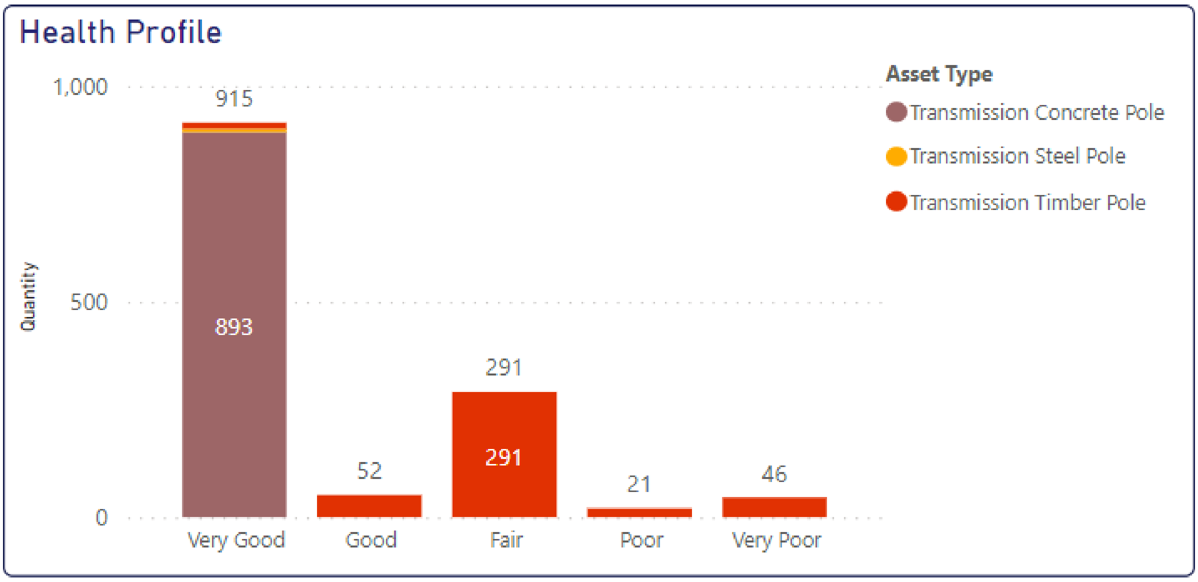


Figure 5 Transmission pole health profile by asset type



2.2 Condition based assessment

Evoenergy considers two kinds of failures as part of its asset management and replacement strategy:

1. **Functional failure**: the inability of an asset to fulfil one or more intended functions leading to reactive replacement or repair.
2. **Conditional failure**: the inability of an asset to meet desired performance criteria, which indicates pending functional failure.

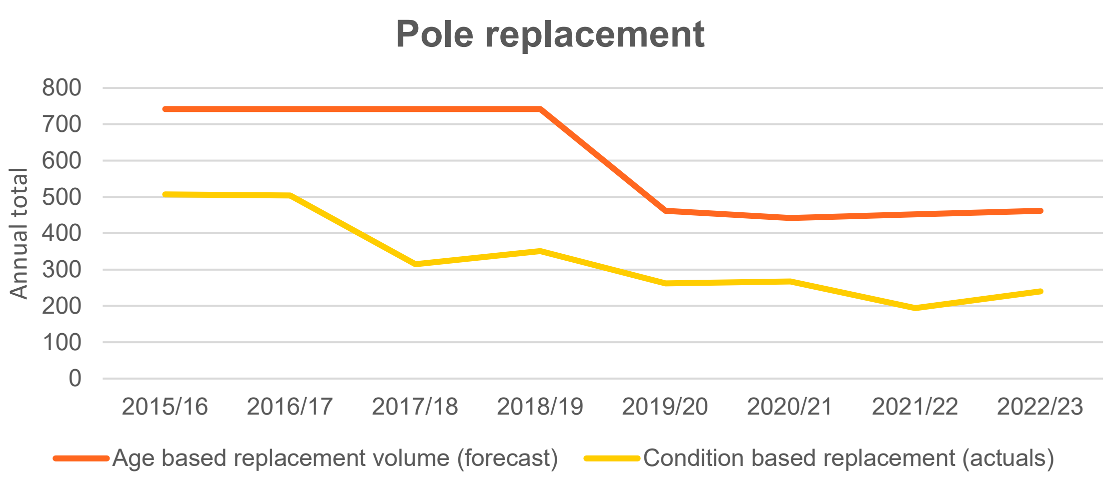
Assets are replaced to mitigate risk and provide benefits to customers. To avoid the risk of functional failure, assets are repaired before functional failures occur and are based on an assessment of asset age and engineering condition assessments.

Noting the AER's review, as well as the extent that outputs of PowerPlan are primarily driven by asset age profiles, not yet fully calibrated to field experience and condition assessment, we recognise this as a limitation and have implemented a 'hybrid approach' to develop the repex forecast involving the PowerPlan output. Replacement forecasts have been validated using condition-based assessments to refine the program downwards and ensure that the risk on the Evoenergy network could be managed over the next 2024–29 regulatory period without placing undue cost pressure on customers.

When a pole is approaching functional failure, Evoenergy uses condition information from inspections and customer feedback against established criteria to define the point of conditional failure. The criteria relates to the 'residual strength' of the pole as well as measurement or assessment of wood quality. These factors ultimately determine whether the pole needs to be managed, reinforced, or replaced (either immediately or within a prioritised rectification program).

Based on these engineering condition assessments, over 800 in-service poles have been flagged for immediate replacement due to reductions in residual strength. Furthermore, based on analysis of historical pole condemnation data, it is anticipated that an additional 1,250 poles (2,050 total poles) will reach the end of life within the 2024–29 regulatory period. Figure 6 highlights this methodology and our refinement of the repex forecast from the age-based PowerPlan outputs to the hybrid approach.

Figure 6 Forecast and actual pole replacement volumes



We are aware of the challenges with the current approach and have commenced a business initiative prior to receiving the AER's Draft Decision. This aims to increase the maturity of our asset data systems and make associated planning processes more transparent through the calibration of PowerPlan to field data and moving to a more consistent and integrated approach for longer term regulatory forecasting to align with AER expectations. Refer to Appendix 1.14 Network Reliability Strategy of Evoenergy's original Regulatory Proposal (January 2023) for a detailed review of our network reliability strategy and objectives.

3. Business cases and economic justification

This section describes the options that were considered to address the increased risk arising from aging timber poles. These options are assessed based on their ability to address the identified needs, prudency and efficiency, and technical feasibility.

The selected option represents the program with the highest (positive) net present value (NPV) and a BCR greater than one for customers and is, therefore, economically efficient.

3.1 Cost benefit analysis

A CBA is conducted to quantify and compare the economic benefits of different investment options. In this case, the benefits are the reduced exposure to potential risks that arise from pole replacement that otherwise may accrue to either Evoenergy (e.g. reliability penalties under the Service Target Performance Incentive Scheme (STPIS)), customers or the community (e.g. bushfire risk) more broadly as a result of the failure of an Evoenergy asset.

When performing CBA, customer benefits are reflected as avoided costs and risks from undertaking asset replacement. The customer benefits associated with replacing assets are calculated based on factors including the risk categories shown below:

Table 3 Risk categories and descriptions

Risk Category	Description
Bushfires	Costs associated with damage from fire to the natural environment caused by failed electrical conductors or equipment.
Public safety	Harm to the public due to falling poles or contact with degraded or fallen live electrical equipment.
Worker safety	Harm to maintenance workers due to falling poles or contact with degraded or fallen live electrical equipment.
Outage	Costs associated from interruptions to electricity supply can affect single customers, businesses and whole communities.
Financial	Expected costs to repair or replace the failed asset.
Environment	Failure effects costs to the environment because of falling poles.

Risk mitigation

This section describes the various options that were analysed to address the increasing risk associated with distribution and transmission pole populations to identify the recommended option out of the three evaluated. The options are analysed based on an ability to address the identified needs, prudency and efficiency, and commercial and technical feasibility to achieve the optimal balance between long term asset risk and short-term asset performance.

For the undertaken CBA, risk before investment (inherent risks) and after investment (residual risk) are considered as part of our network planning process and investment decisions, to assess network performance and capacity against future network needs. Additionally, a series of network and non-network options were considered as part of our investment decision making to meet the required performance targets.

As evidenced in our annual planning reports, infrastructure spending decisions are considered based on the condition and performance requirement for the asset, as well as minimum capacity thresholds to serve the expected demand requirements. The need for pole reinforcement or replacement is driven by the risks that result from a functional failure.

When calculating a risk magnitude, the customer benefits are reflected as costs and risks avoided from undertaking asset replacement. We have considered and quantified the key consequences that can result from pole functional failure, including harm to the public and workers, loss of supply, and damage to the environment (as described in Table 3). We have taken a conservative approach to assessing the risk profile of the pole population for each option, using a pole population age of 60 with the corresponding probability of failure at 2.48 per cent.

- Option 1: Historical repex replacement volume;
- Option 2: Revised EN24 replacement volume; and
- Option 3: Original EN24 replacement volume.

A comparison of the three identified credible options and the issues they address in section 2 is depicted in Table 4 below. Note that capex figures are direct costs and exclude corporate overheads.

Table 4 Comparison of options

Assessment metrics	Option 1	Option 2	Option 3
NPV ($ m, 2023/24)	$14.8	**$21.9**	$27.5
BCR (ratio)	1.57	**1.72**	1.69
Capex ($ m, 2023/24)	$25.8	**$32.1**	$44.0
Meets customer expectations	◑	◕	◑
Aligns with asset objectives	◑	●	●
Technical feasibility	◑	◕	●
Deliverability	●	●	●
Preferred	No	Yes	No

● Fully addresses the issue. ◕ Adequately addresses the issue. ◑ Partially addresses the issue. ○ Does not address the issue.

Option 1 – Historical replacement volume

This option proposes to replace and reinforce poles in accordance with recent historical values, that is, current period spending. It is proposed that the additional risk associated with this strategy will be managed through treatments such as repair and reinforcement. In total, this strategy proposes to replace 1,200 distribution poles and 55 Transmission poles, which have been identified as high-risk, with a further 210 pole reinforcements forecasted within the 2024–29 regulatory control period.

This approach will result in $40.6 million of projected benefits with a real cost of $25.8 million. However, an additional inspection and maintenance requirement is required, with an incremental OPEX cost of approximately $1.36 million (real $2021/22) over the 2024–29 regulatory period. This cost has been driven based on a unit cost of $3,337 required for pole top inspections due to the scaffolding requirements associated with damaged or poorly conditionally deteriorated poles. Furthermore, additional network risk costs associated with the approximately 800 critical risk poles (compared to Option 3) remaining on the network are equivalent to $4.11 million per year.

Alignment with Evoenergy's asset management objectives is a concern due to the location and access constraints as described above. Furthermore, this replacement strategy has the lowest NPV and BCR compared to the other two options and, therefore, was deemed not preferred.

Option 2 – Revised EN24 proposal

This option represents the downward curtailment of the original Evoenergy EN24 proposal to respond to the AER's draft decision and further manage the trade-off between asset risk, operational cost and capex in response to customer price pressures in the current inflationary environment. Essentially, we will continue to manage a higher volume of poles with elevated failure probability in the medium term to help mitigate pricing pressure on customers.

This option proposes a targeted replacement program focusing on the highest risk poles and transmission hardware to maintain system safety and reliability in a prudent and cost-effective manner. A risk-based prioritisation of distribution poles has been performed, considering asset age and condition to inform the replacement program. This option proposes to maintain the current risk profile of the pole network, replacing 1,550 distribution poles, 50 transmission poles and 171 transmission hardware refurbishments and replacements during the 2024–29 regulatory period, with a further 200 pole reinforcements forecast.

This approach will result in $52.5 million of projected benefits with a real cost of $30.6 million (present value). However, an additional inspection and maintenance requirement is required, with an incremental opex cost of approximately $0.77 million (real 2021/22) over the 2024–29 regulatory period. This cost has been driven based on a unit cost of $3,337 required for pole top maintenance due to the scaffolding requirements associated with damaged or poorly conditionally deteriorated poles. Furthermore, additional network risk costs associated with the approximately 450 critical risk poles (compared to Option 3) remaining on the network are equivalent to $2.31 million per year.

Option 2 has a higher benefit cost ratio than Option 3 and has a much lower capex requirement. It has been determined that the inherent risk profile associated with the remaining poor condition poles not replaced as part of this program can be managed through maintenance and reactive replacement.

As a result, the proposed program will address the identified need by progressively replacing the highest risk, most deteriorated poles assets, which has been demonstrated to be technically feasible and aligns with our asset management objectives.

Deliverability of Option 2 is another key consideration. Given the unique topology of the network and the location of the majority of high-risk distribution poles in backyards, this option is preferred from a long-term planning and network maintenance perspective.

Option 3 – Original EN24 proposal

This option reflects Evoenergy's original EN24 proposal. Under this option replacement program focuses on the highest risk poles to maintain system safety and reliability in a prudent and cost-effective manner.

A risk-based prioritisation of distribution poles has been performed, considering asset age and known condition to inform the replacement program. At present, over 6,500 timber poles are older than their typical lives of 55 years, with a further 3,000 forecast to reach this milestone by the end of the next regulatory period.

The replacement of all these poles will lead to an unacceptable increase in expenditure and is not considered efficient and prudent. Instead, this option proposed to replace the highest risk 2,000 poles, 150 transmission poles and reinforce 210 timber poles over the next regulatory control period. This results in an estimated replacement capex of $44.0 million.

The quantum of poles has been built based on current condemned pole levels, as well as historical replacement volumes. Furthermore, pole reinforcement is not considered, as the older poles targeted in this program have already been reinforced to extend their effective operating life.

Despite the higher capex requirements, Option 3 has a more favourable NPV value of the options due to the risk reduction offsetting the continued management of the identified high-risk poles. The deliverability of this option is also a consideration, as most of the high-risk poles are in backyards.

Despite this, the proposed program (Option 2) can address the identified need by progressively replacing the highest risk poles and managing the residual population and is the preferred option.

3.2 Unit cost review

The expenditure for Option 2 has been calculated based on unit rates derived from the recent pole replacement works undertaken during the current regulatory period. This captures the cost challenges for work on the Canberra network due to the access constraints to assets in backyards, additional plant and equipment for new pole installation compared to other DNSPs, and the longer expected life and capex-opex trade-off for the reduced inspection and maintenance requirements for the concrete, steel, and composite pole assets that are not captured in other DNSPs like-for-like wood pole repex costs.

Canberra has a unique network topology with specific access, constructability, and maintenance requirements (as described above). Wood poles have been used to support overhead conductors since the original implementation of Evoenergy's network and remain the primary pole type in service today. Steel tower poles have been introduced relatively recently and are primarily used for transmission lines.

We generally replace poles in a like-for-like approach. However, due to the unique challenges associated with our network and regulatory and work health and safety (WHS) constraints, wood poles are now being replaced with concrete, fiberglass and composite construction poles. This is due to the reduced maintenance and refurbishment requirements over their operating life.

The cost to replace wood poles in the network is typically higher per unit than other DNSPs, as our poles are generally installed in backyards and have more onerous requirements for planning, access, construction, and maintenance activities.

These factors have not only increased the cost of replacing poles, but, in particular, have forced Evoenergy into the position where a replacement of a nailed or Copper Chrome Arsenate (CCA) pole is economically preferred to the replacement of a crossarm due to the high access costs associated with planned and reactive maintenance.

Other considerations impacting Evoenergy's unit cost:

- CCA/treated poles can no longer be cut in a public space and require cranes to physically remove the pole. The pole must be transported wholly back to a controlled environment to cut.
- Nailed Timber poles cannot be accessed with a ladder, requiring an elevated work platform or scaffold to change a service line/crossarm/neutral.
- If poles on either side of a pole replacement are nailed, they must be supported by machinery or a crane.
- Scaffold supplier costs have escalated from approximately $1,800 to $3,800 per pole over the 2024–29 regulatory period.

The 2024–29 regulatory period summary forecast for this program is shown in Table 5. The costs shown are real costs (including overheads) and form part of the overall investment being proposed for the replacement of poles. Refer to Evoenergy Regulatory Information Notice (RIN) data for details on the overall investment proposed for this asset category. Note that based on our pole population data, 60 per cent of the proposed replacement volume has been modelled to require backyard access.

Table 5 2024–29 pole summary forecast (Option 2)

Direct Costs ($ 2023/24)	2024/25	2025/26	2026/27	2027/28	2028/29
Replacement of distribution poles					
Volume of replacement	300	300	310	320	320
Unit cost (public access)	$16,411	$16,411	$16,411	$16,411	$16,411
Unit cost (backyard access)	$18,576	$18,576	$18,576	$18,576	$18,576
Total Costs ($ m)	**$5.31**	**$5.31**	**$5.49**	**$5.66**	**$5.66**
Replacement of transmission poles					
Volume of replacement	5	10	10	15	10
Unit cost	$37,058	$37,057	$37,057	$37,058	$37,057

Total costs ($ m)	**$0.19**	**$0.37**	**$0.37**	**$0.56**	**$0.56**
Reinforcement of distribution poles					
Volume of replacement	40	40	40	40	40
Unit cost	$3,255	$3,255	$3,255	$3,255	$3,255
Total costs ($ m)	**$0.13**	**$0.13**	**$0.13**	**$0.13**	**$0.13**
Replacement of transmission insulators					
Volume of replacement	12	16	16	17	20
Unit cost	$10,191	$10,191	$10,191	$10,191	$10,191
Total costs ($ m)	**$0.12**	**$0.16**	**$0.16**	**$0.17**	**$0.2**
Refurbishment of tower structures					
Volume of Replacement	20	15	20	15	20
Unit cost	$14,543	$14,543	$14,543	$14,543	$15,543
Total costs ($ million)	**$0.29**	**$0.21**	**$0.29**	**$0.21**	**$0.29**

Timber poles vs composite poles

Natural round timber poles were the first pole type to support the overhead distribution network. Timber poles remain the most common pole currently installed in the ACT. However, due to WHS protocols, Evoenergy no longer installs timber power poles that contain CCA or creosote, as this treatment makes the timber hazardous to humans when handled. Creosote and arsenic (arsenate) are listed within the *Work Health Safety and Regulation (2011) ACT* as hazardous chemicals requiring health monitoring.

As a result, when timber poles reach the end of their service life, they are replaced with either composite or concrete poles. Below is a comparison of the two poles' different pole materials. '✓' represents a comparatively better performance, while an 'X' represents a worse performance. As can be seen from Table 6 below, composite poles perform better against concrete poles in several assessment categories and are the preferred option when replacing timber poles. Note the costs presented below are for backyard access rates and are expressed as direct costs (excluding corporate overheads).

Composite poles can also be assembled in segments and do not require cranes to construct, enabling the installation of poles in backyard locations where it is not possible to access with plant.

Table 6 Comparison of installed pole types on Evoenergy's network

Comparison criteria	Composite poles	Concrete poles	Timber poles
Life expectancy	70–80 years	70–80 years	50–80 years
Unit cost	$2,697	$1,611	-
Installation cost	$15,879	$25,075	-
Transportation	✓	X	N/A – not used due to WH&S risks and access costs for regular inspection.
Carbon footprint	✓	X	
Environmental impacts	✓	X	
Constructability	✓	X	
Earthing	✓	X	

4. Recommendation

Evoenergy notes that the more favourable present value for Option 3 (Evoenergy's original EN24 proposal) delivers a higher level of risk reduction and the highest present value compared to Option 1, but it also involves a higher value of capex to be invested— with an upward impact on customer prices at a time of inflationary stress on households.

For that reason, the curtailed Option 2 (Evoenergy EN24 revised proposal) is the preferred option for pole replacement capex. It represents a moderate increase over the AER's draft decision allowance but delivers a stronger present value and benefit-cost ratio when compared to continuing at historical levels of expenditure.

From a broader repex perspective, this business case contributes to a higher total repex allowance than has been allowed for in the AER's draft determination—but still represents a significant reduction on the program that was included in the original EN24 proposal.

Assessment metrics	Option 1	Option 2	Option 3
NPV ($ m, 2023/24)	$14.8	**$21.9**	$27.5
BCR (ratio)	1.57	**1.72**	1.69
Capex ($ m, 2023/24)	$25.8	**$32.1**	$44.0
Meets customer expectations	◐	◕	◐
Aligns with asset objectives	◐	●	●
Technical feasibility	◐	◕	●
Deliverability	●	●	●
Preferred	No	Yes	No

● Fully addresses the issue. ◕ Adequately addresses the issue. ◐ Partially addresses the issue. ○ Does not address the issue.

Abbreviations

Abbreviation	Meaning
AER	Australian Energy Regulator
BCR	Benefit Cost Ratio
CBA	Cost Benefit Analysis
CCA	Copper Chrome Arsenate
DC	Direct Current
DNSP	Distribution Network Service Provider
NPV	Net Present Value
OT	Operating Technology
PoF	Probability of Failure
PV	Present Value
RIN	Regulatory Information Notice
WACC	Weighted Average Cost of Capital
WHS	Workplace Health and Safety