Powercor
AUSTRALIA

AUGMENTATION

REGIONAL AND RURAL EQUITY

PAL BUS 3.09 – PUBLIC

2026–31 REGULATORY PROPOSAL

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1. Overview

We supply electricity to over 540,000 regional and rural customers, including over 28,000 regional and rural customers are supplied by Single Wire Earth Return (SWER) line networks that we operate and maintain. These customers and their communities support key industries that have long been critical to the Victorian economy, including major agriculture, manufacturing and tourism hubs.

The nature of the network that supports regional and customers, however, typically has limited capacity and relatively low reliability and power quality compared to urban networks. This network and corresponding customer experience is being challenged by the changing needs of regional and rural communities in a rapidly electrifying world.

Following significant community engagement, including that spanning multiple regulatory periods, we propose to begin an economic program to upgrade targeted sections of our SWER network. This would improve the ability of regional and rural customers to participate in the energy transition through an investment program that adds 4,800kVA of additional capacity for customers currently serviced by SWER networks. The upgrade program would include 606km of SWER to three-phase upgrades across 44 separate SWER networks and benefit 1,310 customers.

This option also places us in a better position at the end of the 2026–31 regulatory period regarding the overall volume of our end-of-life SWER assets, recognising that 7,000km (34 per cent) of our SWER conductor is in poorer condition today, with this increasing to almost 11,000km (50 per cent) by 2031.

At the same time, we are seeking to improve outcomes for worst-served customers on our network. This is again supported by strong customer and stakeholder support, noting the energy vulnerability of these customers will grow rapidly through the energy transition.

Specifically, we propose to install an additional four HV tie-lines to provide alternative supply pathways and commence the roll-out of 17 SAPS.

A summary of the investment required to deliver these outcomes is set out in table 3. Further detail on each specific investment is set out the corresponding business case in appendix A and B of this document.

TABLE 1 PREFERRED OPTION: REGIONAL AND RURAL SUPPLY ($M, 2026)

EXPENDITURE	FY27	FY28	FY29	FY30	FY31	TOTAL
Rural SWER upgrades	10.7	7.3	12.7	15.6	16.8	63.1
Worst-served customer supply	0.8	6.6	6.7	3.0	1.3	18.4
Total	**11.5**	**13.9**	**19.4**	**18.6**	**18.1**	**81.5**

2. Background

Our network delivers electricity to a 145,000km^2 area that includes communities from the western suburbs of Melbourne and through central and western Victoria to the South Australian and New South Wales borders. In total, more than 540,000 of our connections are for customers living and working in regional and rural areas.

Our electrification and CER integration strategy, included in part B of our regulatory proposal, sets out our approach to accommodating electrification through the 2026–31 regulatory period, including in these regional and rural areas. This business case is a core component of our strategy, covering the specific electrification needs of our regional and rural customers, particularly with respect to regional and rural equity for customers supplied by single wire earth return (SWER) assets, and those customers who experience lower standards of network reliability, who we refer to in this business case as 'worst-served customers'.

Separate business cases cover the general needs of our regional and rural customers, such as those regarding our overall replacement and augmentation programs.

2.1 Regional and rural engagement program

We have undertaken a comprehensive community engagement program to shape our 2026–31 regulatory proposal. Starting in late 2021 with our broad and wide engagement sessions, our customers and stakeholders helped us identify their key needs and preferences. Four key themes emerged from these sessions:

- affordability and equity
- reliability and resilience
- energy transformation
- customer experience.

We have explored these themes in greater detail since, understanding and testing these themes with our customers through face-to-face roundtables, quantitative research, online townhalls and in-depth interviews.

Our program included specific engagement sessions with regional and rural communities to hear about their unique circumstances and preferences, including two regional and rural summits in June 2023 at Creswick and in October 2024 at Bendigo. Participants included our customers such as farmers, local council representatives, community groups, business owners, and residents of regional and rural Victoria.

The summits provided a valuable opportunity to hear directly from regional energy users about the energy challenges they are facing and opportunities for the future in their towns and regions. Participants at our Bendigo summit also provided their views on our draft proposal.

The key themes that emerged from these forums included service levels, electrification, decarbonisation and equity.

Specific findings of our engagement program are discussed throughout this document, and independent reports on our two regional and rural summits are attached with our regulatory proposal.[1]

[1] PAL ATT SE.38 – Rural and Regional Summit: deep and narrow engagement – Jan 2025 – Public; and PAL ATT SE.39 – Rural and Regional Summit: test and validate engagement – Jan 2025 – Public.

We also engaged an independent Customer Advisory Panel (CAP) who we discussed regional and rural equity with. The CAP's insights and recommendations have informed development of this business case.

2.2 Regional and rural networks experience lower service levels

Regional and rural customers, and particularly customers on our SWER networks, experience poorer service levels, including lower reliability, more unstable power quality, lower capacity to export and less ability to electrify compared with urban customers. This is due to the various technical limitations of these networks, such as their lower performance capability and longer distances travelled.

Our SWER network

SWER lines are 12.7kV radial electrical lines that distribute electricity across long distances to customers. SWER lines are made up of a single conductor supported by single insulators on poles with wide spans between each pole.

SWER lines were rolled out across remote and sparsely populated rural areas of Victoria in the 1950s and 1960s to support the electrification of lighting and refrigeration of homes and small businesses in a cost-effective way. This distribution solution delivered electricity at much lower costs than equivalent lengths of three phase 22kV lines, however this came at the expense of lower capacity and ability to provide stable voltage levels than other types of high voltage (HV) lines.

Our network contains the vast majority of SWER lines in Victoria, with 21,300km of SWER lines in our network out of a total 27,700km in Victoria. Through these SWER networks, we supply over 28,000 customers primarily in Victoria's west, north-west and south-west regions.

Of these SWER customers, 8,300 are residential, 1,300 are commercial, 1,500 are industrial and 17,200 are agricultural. The contribution to our economy and society from these customers is significant.

2.2.1 Lower capacities

Customer access to network capacity is limited in SWER lines. Capacity per customer on SWER lines is around one third to half the amount that three-phase networks can support, with some of our lowest performing SWER lines only able to support thermal capacities of between 2–2.5kVA per customer. These capacity limitations are a result of SWER networks initially being designed to serve small loads (mostly lighting and refrigeration).

Use of galvanised steel conductor for SWER lines is extensive due to its low cost, however it is also a key limiting factor for SWER capacity. They have higher resistance than other conductors such as aluminium or copper, and therefore lower capacity to supply customer loads compared to other areas of the distribution network.

SWER networks are also costly to upgrade due to the large geographical spread of customers and long distances covered. Over time, this has resulted in limited investments in upgrading SWER network capacities.

2.2.2 Poor voltage performance

Voltage performance of SWER networks is less stable than other types of network, with large variations in voltage levels across the day and based on how far customers supply point is from the transformer. For example, voltage levels are managed at the transformer, so as customers close to the transformer use electricity the voltage level supplied to customers further away reduces. This creates instability in voltage levels across SWER assets and reduces power quality for our customers.

Voltage levels supplied to SWER customers typically become non-compliant well before capacity constraints are reached.[2]

Poor voltage performance can lead to overvoltage and undervoltage.[3] Overvoltage can restrict customers' ability to export electricity and undervoltage can restrict customers' ability to use electricity. Both overvoltage and undervoltage can cause general appliance malfunction and reduced lifespans, for example the inability to charge EVs.

Undervoltage is likely to be more impactful to customers than overvoltage because it can materially disrupt their lifestyles by damaging appliances, reducing the ability for customers to heat homes or charge their EVs.

2.2.3 Lower reliability

Reliability for customers on our rural networks is lower than those in urban networks due to greater exposure to extreme weather events and the radial structure of most rural networks.[4]

Extreme weather events such as storms, flood and bushfires are more likely to impact regional and rural networks as the networks traverse greater distances and are more exposed to vegetation and landscapes that are affected by these events.

Our maintenance teams often have to travel long distances to find and remediate issues on rural networks, which increases outage response times relative to urban areas and extends the negative impacts of power outages for customers.

The radial nature of many rural networks with no interconnection between other rural feeders also means we have no options to support supply for regional and rural customers with interconnected neighbouring feeders. Supply can only be restored when repairs are complete, resulting in longer outage times.

Table 1 below shows the reliability performance of our urban networks compared to rural networks.

TABLE 2 OUR RELIABILITY PERFORMANCE

FEEDER TYPE	MINUTES OFF SUPPLY PER ANNUM (SAIDI)	INTERRUPTIONS PER ANNUM (SAIFI)
Urban	71.1	0.9
Rural short	123.6	1.4
Rural long	302.7	3.2

However, even within our rural long feeder customer base there is a highly unequal distribution of reliability performance. As part of our worst served customer program we identified 28 areas across our network which experienced greater than 700 minutes off supply and eight outages per annum over the last five years. This analysis is further set out in our worst served customer program business case in Appendix B.

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2 Voltage levels are compliant when they are between 216V and 253V more than 99 per cent of the time for each customer. We must maintain 95 per cent compliance over our customer base to be functionally compliant.

3 Overvoltage is voltage levels supplied to customers over 253V, undervoltage is voltage levels supplied to customers under 216V.

4 Radial networks have a single point of supply.

2.2.4 Export restrictions

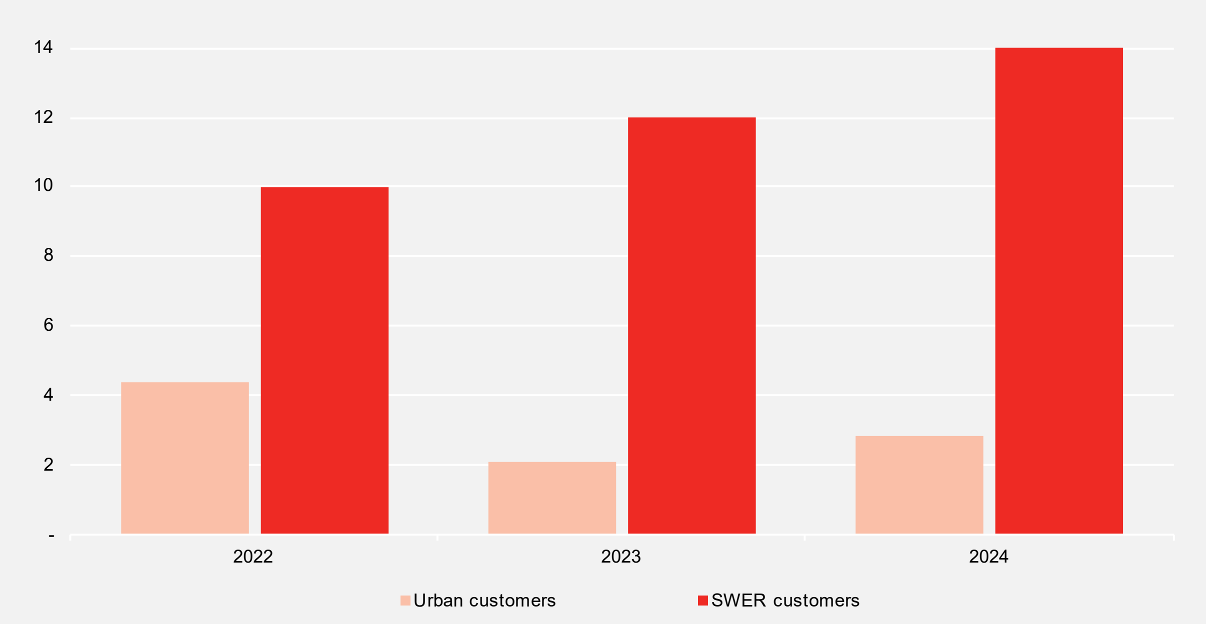
Regional and rural customers generally have lower ability to export solar than in urban areas. This is primarily a result of the lower network capacity and poorer voltage performance.

To date, approximately 335,000 of our residential and 30,000 of our non-residential customers have installed over 1.9GW of small-scale solar. The total capacity of these solar systems has doubled over the last five years. The average residential system size is currently 4.4kW, but continues to grow with new residential systems now averaging over 6kW.

Our network in general has limited capacity to facilitate more customer exports. At a network level, our short rural solar customers have on average used more than 80 per cent of the available intrinsic hosting capacity to support solar exports, while long rural solar customers have used over 90 per cent. Our ability to deliver export services for customers continues to reduce with each new solar connection.

From January 2022, we have connected over 110,000 solar customers, with over 3,500 of these in our SWER network. As shown in figure 1 below, the proportion of SWER customers receiving reduced or zero export limits is increasing.

FIGURE 1 CUSTOMERS RECEIVING REDUCED OR ZERO EXPORT LIMITS (%)



2.3 Commonwealth and Victorian Government initiatives

We have been participating with the Commonwealth and Victorian Governments' policy review to identify barriers for enabling electrification and renewable generation in regional and rural areas, and in particular on SWER networks, known as the Victorian network opportunities study.

We have been asked to provide feedback on the network investment process and to share draft regulatory proposals and network data with Governments as part of this study. The study is investigating the suite of technical, regulatory and commercial barriers to improving power supply in SWER-connected communities and outlines the opportunities available for improving supply on SWER networks. The results of this study are expected to inform both Commonwealth and Victorian network policy direction and future programs.

More broadly, the Commonwealth and Victorian Governments have plans and programs to support the uptake of rooftop solar and the electrification of homes, businesses and transport. The

Commonwealth has identified electrification as a key enabler for reaching Australia's emission reduction targets and expects it will provide a cost-efficient and effective pathway for decarbonising the nation.

Several other Commonwealth policies such as the national energy performance strategy and national electric vehicle strategy emphasise the importance of electrification improving EV accessibility in regional and remote areas, including rolling out EV charging infrastructure across regional Australia.

The Victorian Government also has electrification strategies outlined in its gas substitution roadmap that drive electrification of homes and businesses with goals to phase out new gas connections in residential and government buildings. In the transport sector, its zero-emissions vehicle roadmap includes a $19 million investment in the roll-out of EV charging infrastructure across regional Victoria.

2.3.1 Regulatory framework barriers

The existing regulatory framework justifies expenditure by assessing the value of energy at risk and comparing it against the cost of applicable upgrades to reducing the value of energy at risk. This approach has merit because it delivers efficient and economic upgrades for customers by prioritising dense areas with high amounts of electricity usage.

However, this approach does not recognise the impact of increasing customer reliance on electricity in an electrified future, particularly for customers outside dense urban areas. The regulatory framework is incomplete because there is no guidance on minimum service standards to support fully electrified homes. Without this guidance, equity is not adequately considered in the regulatory framework.

3. Identified need

Customers at our regional and rural summits emphasised that improving reliability, capacity and power quality is critical to the survival and growth of regional and rural communities. Addressing these issues was perceived by our customers as enabling communities to participate in the energy transition.

Customers serviced by our lower capacity networks, however, will have limited ability to participate in the energy transition due to our networks lower propensity to support electrification and their provision of less stable power quality, alongside reduced ability to export. Customers will be unable to realise the benefits of electrification and the inequity gap in service levels between regional and urban customers will continue to widen.

While pragmatic regarding the fact that service level differences between higher and lower density areas will continue to some extent, increasing inequity gaps between regional and urban customers were clearly viewed as not acceptable to our customers.

Due to the inability of SWER customers to electrify their use of other fuel sources, the decarbonisation of regional and rural communities will also lag behind urban communities. This will hinder the achievement of Government-mandated emissions reduction targets.

Further, our SWER network is predominately aged between 55 to 70 years old, with the condition of these assets forecast to deteriorate materially over the following decades. All else equal, this will lead to an increase in asset failures over time and a reduction in reliability.

Given the above, the identified need is to ensure that our network is fit-for-purpose in an electrified future and ensure that regional and rural communities are not left behind in the energy transition.

3.1 Our stakeholders expect a fair and just energy transition

A key finding of our engagement was that our stakeholders believed that the energy transition should be fair and just for all customers. This sentiment was expressed by our regional and rural communities, but also shared by our customers in urban areas as well.

Key perspectives shared by our customers were that SWER networks will limit the benefits of electrification and increase inequities in service levels between urban and regional areas. This was viewed by customers as alarming in an electrified future, where customers feared for their communities' ability to participate in the energy transition.

3.1.1 SWER networks will limit the benefits of electrification in regional communities

As outlined throughout section 2, SWER lines have several limitations compared with other types of networks, including lower capacity provisions and less stable power quality. These limitations will increasingly hinder customer ambitions to electrify and decarbonise their energy usage as available capacity becomes exhausted.

This means that communities served by SWER networks will be limited in their ability to support electrification and decarbonisation of regional and rural Victorian communities, impacting customers' ability to participate in the energy transition and benefit from efficient electric technologies.

Our customers, however, expect to be able to access the benefits of electrification and participate in the energy transition, including the use of more productive technologies, adoption of renewable generation, improved energy efficiency and ability to decarbonise.

With SWER networks only able to support thermal capacities of between one third to half the amount of capacity that three-phase networks can support, our ability to deliver electrification opportunities for

SWER customers will reduce over time as existing capacity becomes utilised, leaving many customers unable to electrify.

Customers are already experiencing material issues on SWER networks today. Figure 2 describes a recent case study of a SWER customer complaining to us about poor service quality.

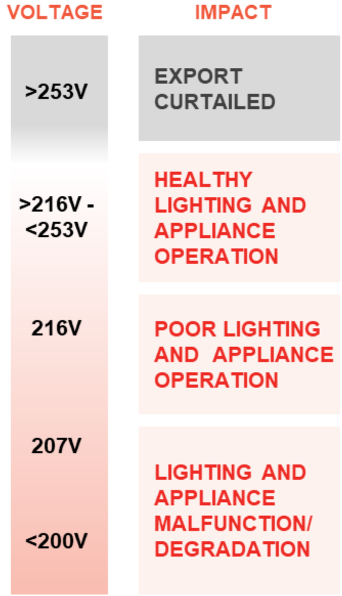
FIGURE 2 CASE STUDY: SWER CUSTOMER EXPERIENCING DAILY DISRUPTIONS

A customer in Evanstown complained to us that they were experiencing daily issues with their fridge, freezer, hot water and lighting that were more pronounced in summer and winter.

The customer shared that these issues routinely disrupted their day-to-day activities, particularly during hot days through summer and cold days through winter.

We found that fluctuating voltage levels that were caused by voltage instability on the SWER network supplying this customer were causing their issues. Voltage levels supplied to this customer both exceeded 253V and dropped below 216V

This customer experienced these issues with only four customers supplied by the SWER network.



Customers have intentions to access the benefits of electrification and participate in the energy transition

Customer uptake of renewable electric technologies such as rooftop solar and EVs continues to grow, with 23 per cent of residential and almost 60 per cent of small and medium business customers surveyed across our network either have an EV or are interested in purchasing one within the next five years.

Regional and rural customers across our network are attracted to accessing the benefits of electrification, which include:

- access to better and more productive electrified technologies, such as EVs, air conditioners, automated agricultural machinery and renewable energy technologies
- more efficient and lower cost energy usage, with electrified appliances typically using less energy than carbon-based fuels
- the ability to decarbonise energy usage in their communities and contribute towards the achievement of net-zero targets
- the ability to participate in the energy transition and take advantage of opportunities to automate home appliances and take advantage of time-of-use tariffs
- supporting growth and economic opportunities within regional and rural areas to attract businesses, stimulate growth, create employment opportunities and improve the livelihoods of their communities.

We heard consistently through our engagement that customers have intentions to electrify their homes, businesses and machinery to access these benefits:[5]

> *"From our perspective, one of the biggest priorities is increased electrification – so moving away from gas, particularly for heating…"*
>
> *Commercial and industrial customer with sites across regional Victoria (2023)*

SWER networks do not have sufficient capacity to support electrification and the adoption of renewable technologies

Despite customer expectations to electrify, regional and rural stakeholders feel the SWER networks' ability to support renewable and electrified technologies is restricting customer choice and impacting their ability to adopt electrified technologies and participate in the energy transition.

Increasing numbers of SWER customers are ineligible to export solar PV to the network due to network constraints, with customer concerns validated given export curtailment has been trending upwards (as shown previously in figure 1).

Insufficient electrical capacity in SWER networks is also preventing business customers from installing the required infrastructure to charge or use electric equipment, putting them at an economic disadvantage relative to customers with three-phase electricity supply. Stakeholders believed that the limited capacity of SWER networks was restricting business growth, particularly in the dairy and food manufacturing industries:[6]

> *"It baffles me, I can't have the option of three-phase power, but I am providing food for the nation."*
>
> *Powercor customer (2023)*
>
> *"It's a 'basic service' inequity when a man in the city can subdivide a block and get three-phase for 'tinkering in his shed', when genuine businesses which are the fabric of the community, and employing so many, can't get it."*
>
> *Powercor customer (2023)*

Stable power quality is a priority for regional and rural businesses

Power quality emerged as a key priority for our customers, particularly for commercial and industrial customers. Poor power quality supplied to these customers can lead to momentary outages, impacting business operations, equipment performance, and overall productivity. While a momentary outage might be a minor disruption for the majority of customers, it is a major disruption for commercial and industrial customers that can have material financial impacts.

Dairy and other agricultural or manufacturing production processes are particularly sensitive to power quality disruptions. Even momentary interruptions can cause production delays, spoilt product and lengthy clean up processes. Poor power quality can also seriously impact animal welfare.

During an exercise that gave commercial and industrial customers a notional $100 to spend to improve service levels, customers on average allocated $42 towards improving power quality, the most of any option. Commercial and industrial customers considered that the importance of power quality was growing.

These findings were supported by on-site visits with commercial and industrial customers in the greater Shepparton region, where we visited 17 businesses to challenge these findings with on-site

5 PAL ATT SE.13 – Forethought - Economic Growth Engagement, p. 22
6 PAL ATT SE.38 – Forethought - Rural and Regional Summit: deep and narrow engagement, p. 17

feedback. Customers emphasised that adequate power quality was critical to supporting stable operation of their businesses as they shared their experiences with power quality disruptions:[7]

Case study: dairy farming and food processing

Multiple dairy farmers located in regional Victoria detailed their heavy reliance on electrically powered equipment for milking, refrigeration, and environmental control within their operation. Voltage sags and surges can disrupt sensitive milking machinery, potentially harming the animals if interruptions cause extended outages and compromising the quality of milk production. Furthermore, power interruptions can lead to the spoilage of stored dairy products in refrigeration units, resulting in financial losses.

To mitigate these issues, some customers invested in backup power solutions, such as generators or uninterruptible power supply (UPS) systems, to support continuous operation during outages. They believed they need to work closely with their electricity distributor in the future to address power quality concerns and develop strategies for maintaining the reliability of their dairy farm's power supply.

However, these measures come at significant cost. These costs are perceived as a substantial barrier for large farms and often not feasible for small farms to fund.

Similar examples existed from dairy processing facilities facing significant challenges due to power quality issues. These facilities require various electrically powered machinery for pasteurisation, packaging, and refrigeration.

Voltage excursions and outages can lead to substantial product spoilage, financial losses, and regulatory compliance concerns, especially when precise temperature control is essential. Power interruptions during the cheese-making process, for example, can force the disposal of product with losses ranging up to $25,000.

3.1.2 Increasing regional and rural inequities are not acceptable to our customers

Our inaugural regional and rural Summit held in Creswick in 2023 found that our customers were keenly aware of the existing disparity in service levels between urban and regional areas, and recognised the negative impact this had on their communities. Customers emphasised the significance of a reliable electricity network as the foundation for the well-being and development of regional and rural areas.

Attendees at the Creswick regional and rural summit recognised that while there may be prevailing circumstances for current disparities in service levels between urban and regional areas, growing service level disparities in an electrified future were unacceptable. As general reliance on electrified technologies grows over time with the adoption of electric homes, vehicles and machinery, participants felt they were at risk of being left behind without intervention. This was an unacceptable outcome to our stakeholders.

Improving regional and rural equity, therefore emerged as one of the most important topics for participants throughout the development of our regulatory proposal. Inequitable electricity supply outcomes were impacting communities’ ability to attract workforces, grow businesses and participate in the energy transition. Improving equity was considered to be an outcome of improving network reliability, capacity and power quality.

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7 PAL ATT SE.13 – Forethought - Economic Growth Engagement, p. 10

3.1.3 SWER networks hinder the achievement of Government-mandated emissions targets

The federal and Victorian Governments have both mandated net-zero targets that set out dates for achieving net-zero. Achieving net-zero will help prevent the worst impacts of climate change and will also deliver several other benefits, including the creation of jobs and new industries.

The federal Government has legislated net-zero by 2050, supported by near-term targets of a 43 per cent reduction below 2005 levels by 2030.

The Victorian Government has committed to achieving net-zero by 2045 and has a legislated net-zero emissions target of 2050. It has also set interim emissions reduction targets of 45–50 per cent by 2030 and 75–80 per cent by 2035, which are required under the *Climate Change Act (2017)*. The achievement of these targets relies on significant decarbonisation efforts by electricity consumers.

Electrification will be a key contributor to decarbonisation. The Victorian Government's Gas Substitution Roadmap outlines its plan to transition away from fossil fuel gas use towards zero emissions alternatives. The electrification of gas is set to add significant new loads to our network that will be required to support electrification and decarbonisation.

As outlined previously, SWER networks do not have the capacity to support customers to fully decarbonise their emissions profiles in a net-zero future. The inability for SWER customers to electrify would impact the ability for regional and rural Victorians to contribute towards achieving mandated emissions reduction targets.

Our regional and rural customers expressed concerns over the absence of a clear and cohesive strategy to help regional and rural areas achieve net-zero emissions, indicating that the current plans did not sufficiently consider their unique challenges and contributions to the energy transition.

Consistency with the National Electricity Objective

Our delivery of services for all of our customers must align with the National Electricity Objective (NEO). The is defined as follows:

> *to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:*
>
> *a) price, quality, safety, reliability and security of supply of electricity; and*
>
> *b) the reliability, safety and security of the national electricity system; and*
>
> *c) the achievement of targets set by a participating jurisdiction—*
>
> *i) for reducing Australia's greenhouse gas emissions; or*
>
> *ii) that are likely to contribute to reducing Australia's greenhouse gas emissions.*

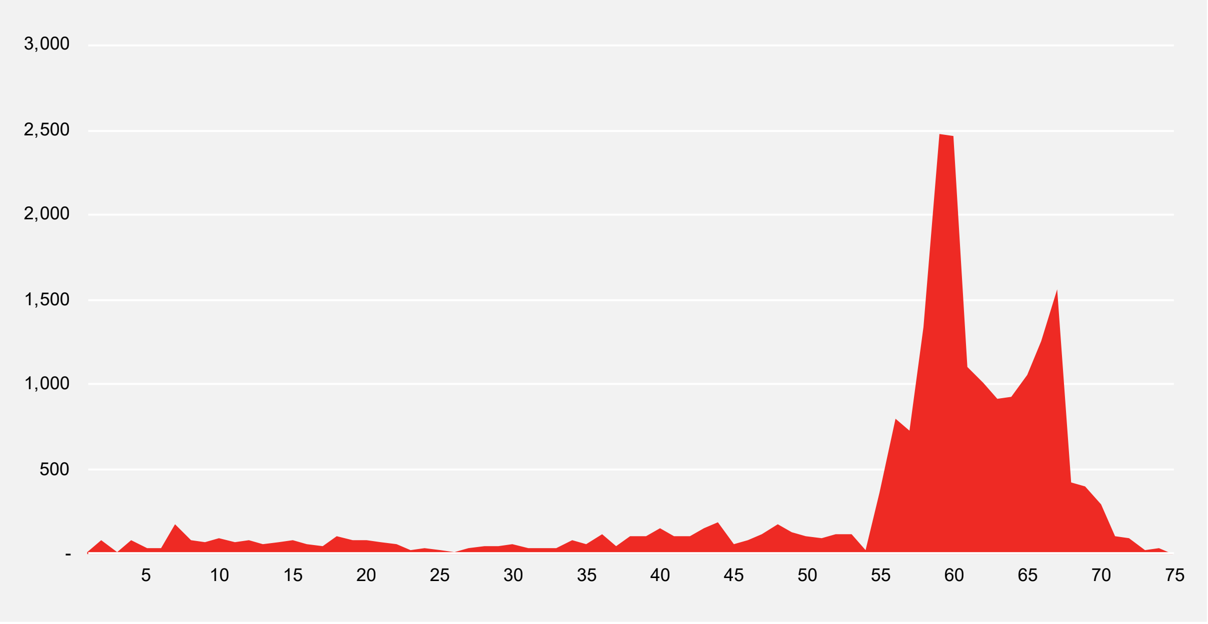
Our stakeholders do not believe that SWER networks will deliver electricity at a suitable quality or reliability level that would be expected from our customers in an electrified future.

Additionally, the NEO sets out that we must consider the achievement of Government emissions reduction and net-zero targets when planning network investments. The current capabilities of our SWER network will not support broad electrification of SWER-connected customers, which will impact our ability to support the achievement of long-term Government emissions reduction targets.

3.2 Strategically planning for aging SWER assets is prudent

At the same time as our customers have raised concerns about the ongoing limitations our SWER network, the conductor itself is approaching the end of its expected service life.[8] For example, as shown in figure 3, the majority of our 21,300km of SWER conductors is aged between 55 and 70 years old.

FIGURE 3 AGE OF OUR SWER ASSETS (KMS)



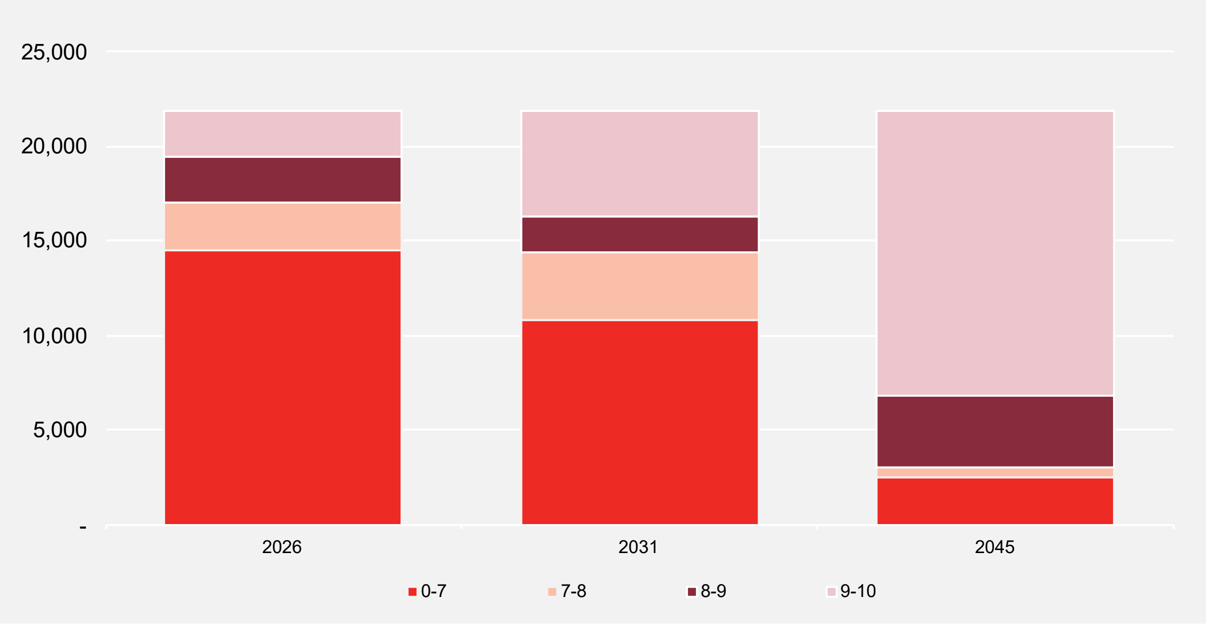
As our assets continue to age and their condition deteriorates over time, we will need to increasingly expand our reactive repair and replacement program to manage the performance of our SWER assets. To forecast condition, we use a probabilistic risk management approach, expressed through a representative 'health index'.

The health index considers condition data, environmental factors and operating factors. Each asset's condition is rated between zero and 10, where zero represents new assets with low probability of failure and 10 is applied to aging assets with high probability of failure. Asset replacement or retirement is generally considered a priority when an asset is rated seven or above, signalling it is close to end of life.

Figure 4 shows the current and forecast health index rating of our SWER networks. Over 7,000km (34 per cent) of our SWER conductor has a health index rating of seven or more today, with this increasing to almost 20,000km (89 per cent) by 2045.

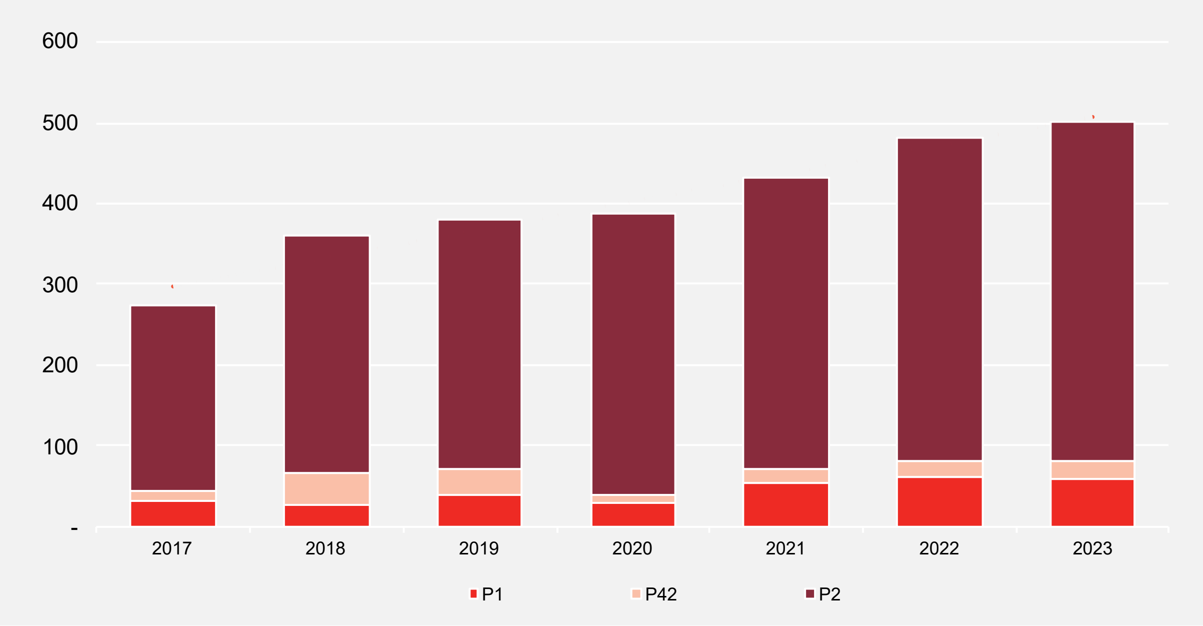
[8] Over 93 per cent of our SWER network comprises steel conductor, with the remainder being aluminium conductor steel reinforced (ACSR). These conductor types have an expected service life of 70 and 65 years respectively.

FIGURE 4 CURRENT AND FORECAST HEALTH INDEX: SWER ASSETS (KM)



The health index of our SWER assets aligns with our observed defects experience in our HV and SWER conductors over the last few years. As shown in figure 5, we experienced almost twice as many HV defects in 2023 compared to 2017, with defects increasing year on year.[9] Given the health index of our SWER assets continues to deteriorate, we expect to see growing defects in the future.

FIGURE 5 HIGH-PRIORITY DEFECTS: HV CONDUCTOR (INCLUDING SWER)



Our typical approach to managing assets with high health index ratings is like-for-like replacement. However, given changing customer needs and expectations, ongoing electrification, and an accelerating energy transition, it is prudent to consider now whether our SWER networks will remain fit for purpose in an electrified future and develop a plan to address these issues.

[9] P1, P42 and P2 represent the timeframes associated with rectifying observed defects. P1 defects must be made safe within 24 hours, and P42 and P2 defects must be addressed with 42 days and 32 weeks respectively.

4. Options considered

Our first step in formulating options for meeting the identified—to ensure that our network is fit-for-purpose in an electrified future such that regional and rural communities are not left behind in the energy transition—was to develop a long-term roadmap for regional and rural supply.[10] The development of this roadmap was in direct response to, and informed by, stakeholder feedback.

This approach was intended to ensure that our proposed solutions not only meet technical and economic requirements, but also align with the expectations and needs of the communities we supply.

Long-term strategic plan for SWER upgrades

While customers throughout our engagement favoured immediate action compared to inaction, there were calls to consider strategic challenges with a longer-term view, recognising the scale of the challenge is a multi-period issue.

Participants at our Creswick summit unanimously called on us to shift our thinking from the immediate regulatory period towards a longer-term view of addressing future challenges. Customers strongly believed that a longer-term view was the only way to ensure that the inequity gap between regional and urban communities would not widen further through the energy transition and their communities would not be left behind. These views aligned with findings from our early engagement program that regional and rural customer perceived their energy outcomes had been historically neglected due to an incomplete regulatory framework.

4.1 Rural and regional network roadmap

In 2024, we engaged an independent technical advisor to develop a regional and rural roadmap (in collaboration with AusNet Services, who face similar challenges with their regional and rural customers) that identifies a series of long-term strategies and short-term recommendations to bridge regional and rural equity gaps over time.

One of the key strategies outlined in this roadmap is to prioritise SWER network upgrades, including replacing SWER lines with multi-phase lines and upgrading transformers if increased demand can be met without line upgrade.

A further recommendation was to identify remote customers suited to stand-alone power systems (SAPS) as part of improving outcomes for worst-served customers.

Both of these recommendations are explored in the respective business case in appendix A and B.

The roadmap also suggested implementing short-term strategies for immediate capacity enhancements. We have thus incorporated smaller upgrades and ad-hoc maintenance in our analysis. However, these measures alone are unlikely to meet the long-term needs of regional and rural communities.

4.2 Customers support an ambitious investment program

A key feature in the development of our draft and regulatory proposals was testing and challenging the extent to which our proposed investment met the needs and expectations of our customers and stakeholders. For our regional and rural program, the testing of options was undertaken through two key initiatives—our trade-off forums and our second regional summit.

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10 IAEngg, Powercor and AusNet Services, Regional and rural network roadmap (2024)

4.2.1 Customer trade-off evaluations

In 2024, we conducted research to understand residential and small-medium business customers' willingness to pay for discretionary service initiatives. The study involved over 500 residential and small-medium business customers.

As part of these evaluations, we presented customers a package of initiatives to support regional and rural supply upgrades to enable further growth opportunities in regional communities. We also presented a package to reduce the annual minutes off supply for worst served customers through targeted network investments.

At our trade-off forums, 74 per cent of all customers supported either a $50 million program (with residential bill impacts of $0.61 per annum) or a larger $70 million program (with residential bill impacts of $0.85 per annum) to improve regional and rural customer outcomes. Additionally, 78 per cent of all customers supported either a $12 million program (with residential bill impacts of $0.15 per annum) or a larger $20 million program (with residential bill impacts of $0.24 per annum) to reduce the annual minutes off supply for worst served customers.

Although stakeholders expressed a high level of support for this proposal, there were also concerns about its limited scope. Stakeholders felt that investing $50 million, representing only two per cent of our overall budget, was insufficient given the magnitude of these issues for rural communities. That is, stakeholders felt that more investment was required if regional and rural communities were to have access to energy that supports their growing needs.

Stakeholders acknowledged the difficulty of balancing cost considerations with necessary infrastructure investments, however, there was general agreement that improving supply reliability was critical, especially in regions dependent on agriculture. Customers wanted us to proactively invest in SWER upgrades and expressed a general willingness to pay more now (in the forthcoming regulatory period period) than delay investment.

4.2.2 Regional and rural summit: Bendigo

Following the publication of our draft proposal, which included $45 million to upgrade supply for a limited set of SWER customers, we hosted our second regional and rural summit in partnership with Farmers for Climate Action.

We sought direct views on our proposed $45m investment to upgrade sections of our SWER network to three-phase power and there was an overarching view that this amount was grossly insufficient. Customers emphasised that we had not been ambitious enough to materially address the needs of their communities and reiterated their frustration at perceived growing inequity of service outcomes between urban and regional customers.

During a series of roundtables, our customers affirmed support for investment to manage increasing load across our network, primarily driven by greater EV uptake.[11] There was broad agreement between customers that additional investment is necessary to maintain reliability of supply as the energy transition accelerates. Customers emphasised the benefits of ensuring the sustainability of solutions, while avoiding temporary fixes.

Upgrading SWER lines emerged as a clear priority, with many advocating for greater investment than the $45 million currently allocated to improve service for over 3,000 customers. Feedback reflected the key values that underpinned all discussions, namely that all energy customers deserve reliable access, infrastructure should support clean energy like EVs and solar panels, and the energy shift should not leave host communities in energy poverty.

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[11] PAL ATT SE.25 – Forethought - Test and Validate: Commercial & Industrial Customers Report, p. 31

We also sought customer's views on improving regional and rural customer's service levels. While customers were hesitant to support a minimum service level across the network, they were strongly support on moving the service level of worst served customers closer to the network's median standard of supply.

Further detail on customer feedback from our Bendigo regional and rural summit can be found in our regional and rural summit report.[12]

4.2.3 Test and validate roundtables

We sought to understand support for regional and rural equity upgrades with our broader customer base through our test and validate roundtables, which included urban customers. Participants at our test and validate roundtables recognised that more investment was required, despite regulatory limitations.

Generally, participants broadly recognised regional challenges and the intent to invest in strengthening the network. Participants stressed that improving regional and rural reliability would require not only technical upgrades but also a shift in planning and policy to recognise the distinctive requirements of regional and rural areas. Frustration was raised in the regulatory framework that has resulted in poor service levels being experienced, and inability to service the growing energy needs of regional and rural customers.

Participants appreciated our commitment to addressing the underinvestment in rural infrastructure. There was strong support for upgrading SWER lines to three-phase but concerns were raised about the limited scope of the initiative. Customers perceived that $45m, representing less than 2 per cent of our overall capex proposal, was insufficient to address one of the most critical issues for rural communities.

Agricultural regions, particularly those that are heavily reliant on reliable electricity for farming operations, were identified as most at risk from inadequate power infrastructure. Participants expressed concern that unreliable power supplies are harming local business competitiveness as well as the ability of farmers to feed the nation and export, which all provide economic benefits to Victoria and Australia. For every dollar spent within the region, there was said to be a $5 return; noting the strong economic backing for investing in regional and rural Victoria.[13]

> *""If farmers have to throw out food or it costs more to produce, prices go up for Australians to eat."*
>
> *Powercor participant*

Further detail on customer feedback to our draft proposal can be found in our test and validate roundtable report.[14]

4.2.4 Customer Advisory Panel feedback

We also presented our draft proposal to the Customer Advisory Panel (CAP). In response, they also expressed concern about the limited scale of our proposal and questioned whether it was sufficiently ambitious given the scale of the challenges ahead, particularly in terms of starting to tackle the lower levels of service experienced by rural customers.[15]

Similarly, the Victorian Department of Energy, Environment and Climate Action expressed concern about the limited investment and supported further investment to enable electrification in regional and rural communities.

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12 PAL ATT SE.38 – Rural and Regional Summit: deep and narrow engagement – Jan2025 – Public
13 PAL ATT SE.28 – Test and Validate: Roundtables – Jan2025 – Public
14 PAL ATT SE.39 – Rural and Regional Summit: test and validate engagement – Jan2025 – Public
15 PAL ATT SE.30 – CAP – Report on Draft Proposals – Nov2024 – Public

4.3 Preferred option

The scale and scope of the energy transition is fundamentally changing the nature of our electricity network, and the service levels expected by our customers. The successful transformation of our economy toward net-zero requires all parties to play their role—incumbent in this is that no customer or customer group is left behind.

Consistent with this, and the strength of the near-unanimous support from all customer and stakeholders, our preferred option is start transitioning areas of our SWER network to higher capacity supply. Based on our sophisticated constraint modelling, we propose to upgrade 601km of SWER in the 2026–31 regulatory period, benefiting around 1,178 regional and rural customers.

Additionally, we propose targeted improvements to service levels for worst-served customers. This includes an additional four HV tie-lines and 17 SAPS.

These proposed investments are summarised in table 3. Given that our existing SWER network is approaching the end of its expected service life, and the extent of electrification forecast in the future, we consider these investments to be 'least regrets'.

TABLE 3 PREFERRED OPTION: REGIONAL AND RURAL EQUITY ($M, 2026)

EXPENDITURE	FY27	FY28	FY29	FY30	FY31	TOTAL
SWER upgrades	10.7	7.3	12.7	15.6	16.8	63.1
Worst-served customer supply	0.8	6.6	6.7	3.0	1.3	18.4
Total	**11.5**	**13.9**	**19.4**	**18.6**	**18.1**	**81.5**

Further detail on each specific investment is set out the corresponding business case in appendix A and B below.

A

REGIONAL AND RURAL SUPPLY UPGRADES

A Regional and rural supply upgrades

Over 28,000 regional and rural customers are supplied by the SWER line networks that we operate and maintain. Our SWER line networks were installed in the 1950s and 1960s to electrify the regions and deliver basic electricity services for regional and rural customers at a relatively low cost, predominately to power lighting and refrigeration.

Customer expectations from their electricity service have moved past lights and refrigeration towards the full electrification of homes, transport and businesses.

Regional and rural customers on SWER line networks currently experience lower service levels when compared to urban networks. SWER customers have lower capacity to electrify, poorer voltage performance, lower reliability and more export restrictions. Service level inequities are expected to widen through the energy transition as more customers electrify.

Our stakeholders expect a fair and just energy transition where increasing service level inequities are unacceptable.

A.1 Identified need

As discussed in section 3.2 above, the identified need is to ensure that our network is fit-for-purpose in an electrified future and ensures that regional and rural communities are not left behind in the energy transition.

Our SWER networks are approaching the end of their technical lifespan, with the majority of our 21,300km of SWER conductors aged between 55 and 70 years old. As our SWER networks approach their end-of-life stage, it is prudent to develop a plan to manage the population of our SWER networks while considering whether SWER networks will remain fit for purpose in an electrified future.

A.2 Options considered

Our typical asset management approach when assets have reached their end of life is to replace them with like-for-like assets.[16] However, we must also assess the viability of our SWER networks in an electrified future.

This business case identifies SWER networks that are viable to upgrade over the 2026–31 regulatory period. Viable SWER network upgrades have been identified using the holistic forecasting capabilities of our Energy Workbench tool, which forecasts thermal and voltage constraints across our entire network for every 30-minute period. The Energy Workbench tool considers time-series energy at risk from both thermal and voltage constraints, the expected customer benefits of network upgrades and the cost of SWER upgrades. Further information about our forecasting tool and methodology can be found in our customer electrification forecasting methodology.[17]

Our benefits modelling also considers, for example, avoided failure and bushfire reduction risks.

The set of economically viable upgrades have then been considered in multiple options that primarily vary based on the speed and extent to which we could upgrade our SWER networks over the 2026–31 regulatory period. A summary of these options is shown below in table 4.

16 Our asset class overview for overhead conductor (PAL BUS 4.03) separately assesses the economic viability of SWER network replacement on a like-for-like basis. Any overlaps have been excluded from our overhead conductor replacement business case to avoid double-counting.

17 PAL ATT 2.01 – Customer electrification forecasting methodology – Jan 2025 – Public

Further information on our economic assessment of SWER upgrades can be found in our attached cost benefit modelling, with a full description of the methodology underpinning our cost benefit analysis in our attached customer electrification forecasting methodology.[18]

TABLE 4 ECONOMIC SUMMARY OF OPTIONS ($M, 2026)

OPTION	PV COSTS	PV BENEFITS	NET BENEFITS
Base case: maintain status quo	-	-	-
Limited SWER upgrades program	-40.4	554.3	513.9
Economic SWER upgrades program	-57.3	599.9	542.5
Accelerated SWER upgrades program	-109.9	646.7	536.7

A further summary of the investment program and the customer benefits of each option is described below in table 5.

TABLE 5 INVESTMENT PROGRAM AND CUSTOMER BENEFITS SUMMARY OF OPTIONS

OPTION	SWER UPGRADED (KM)	ADDED CAPACITY (KVA)	LINES UPGRADED	CUSTOMERS WHO BENEFIT
Status quo	-	-	-	-
Limited SWER upgrades	422	3,458	33	971
Economic SWER upgrades	606	4,800	44	1,310
Accelerated SWER upgrades	1,160	7,353	79	2,117

Each option is described in further detail below, including our stakeholder perspectives and preferences shared through our engagement program.

A.2.1 Option one: maintain status quo

This option would maintain the status quo approach of relying on existing asset management practices such as maintenance and scheduled replacement. No consideration would be given to upgrading SWER networks and no capital expenditure to upgrade SWER networks would be proposed.

This option would minimise the ability of regional and rural customers to participate in the energy transition through a lack of available capacity to electrify homes, businesses and transport. It would lead to widening inequity gaps between urban and regional customers over time as the energy transition continued to prioritise urban customers.

[18] PAL MOD 3.30 – Regional and rural SWER upgrades – Jan 2025 – Public; and PAL ATT 2.01 – Customer electrification forecasting methodology – Jan 2025 – Public

Regional and rural SWER customers would see lower electrification rates, lower ability to share renewable energy resources and reduced social and economic opportunities. The inability for SWER customers to electrify would also impact the ability for regional and rural Victorians to contribute towards achieving mandated Government emissions reduction targets.

Our customers, however, expect to be able to access the benefits of electrification and participate in the energy transition, including the use of more productive technologies, adoption of renewable generation, improved energy efficiency, improved power quality and ability to decarbonise.

This option would also not begin to address the significant volume of SWER lines that are approaching end-of-life (i.e. it would continue to 'kick the can down the road').

This option, therefore, does not address the identified need.

A.2.2 Option two: limited SWER upgrades program

This option would pursue SWER to three-phase upgrades at high-value sites across our network, consistent with the proposed $45 million of capital expenditure outlined in our draft proposal.

High-value sites would be targeted based on site-level economic assessments of the net benefits and costs of upgrading SWER networks to three-phase networks. Sites with the highest net benefits would be upgraded first, targeting a total program of $45 million. This option does not target all sites that have positive net economic benefits.

In total, this program would add 3,458kVA of additional capacity for customers currently serviced by SWER networks. The upgrade program would include 422km of SWER to three-phase upgrades across 33 separate SWER networks, with 971 regional and rural customers benefitting from these upgrades (including 443 customers that would have their voltage performance improved from non-compliant levels to compliant levels).

This option would improve the ability of regional and rural customers to participate in the energy transition through greater ability to electrify, better power quality, reduced bushfire risk and improved reliability. Customers would be readily able to contribute to net-zero targets, have the ability to expand their businesses and have enhanced options to share renewable electricity through their communities.

While this option would improve customer outcomes, it would only lead to the upgrade of less than two per cent of existing SWER networks by 2031.

We tested this option with customers during our 'test and validate' engagement, in particular through our regional and rural forum held in Bendigo. Customers who attended this forum broadly acknowledged the critical need for investment, with most participants expressing strong support for increasing investments.

Most participants, however, questioned the sufficiency of the proposed $45m investment and advocated for a more ambitious commitment. Participants felt that the proposal would take an excessively long time to replace SWER lines and may not address the needs of the region. The overarching sentiment of forum participants reflected a need for a more ambitious and future-focused approach to better algin with community and economic needs.[19]

> *"The $45 million investment is a drop in the ocean. It's not enough to make a real impact"*
>
> *Powercor customer, Rural and Regional Summit*

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[19] Forethought, Rural and Regional Summit Report, 2024, p. 23

Customers who attended our test and validate roundtables, including urban customers, shared similar sentiments that our draft proposal investment program was insufficient to materially address regional and rural issues. Further detail on customer feedback can be found in section 4.2.

While this option would begin to limit the widening inequity gaps between urban and regional customers, this option does not meet customer expectations for our SWER networks in an electrified future.

The present value of the costs and benefits of this expenditure are summarised in table 6 below.

TABLE 6 OPTION TWO: BENEFITS ASSESSMENT SUMMARY ($M, 2026)

DESCRIPTION	PV COSTS	PV BENEFITS	NET BENEFITS
Limited SWER upgrades program	-40.4	554.3	513.9

A.2.3 Option three: economic SWER upgrades

This option would pursue more SWER to three-phase upgrades at high-value sites across our network than we proposed in our draft proposal, making up a $63 million investment program.

High-value sites would again be targeted based on site-level economic assessments of the net benefits and costs of upgrading SWER networks to three-phase networks. However in contrast to option two, this option would upgrade all sites with positive net benefits that are economic to upgrade. through the 2026–31 regulatory period.

This option would improve the ability of regional and rural customers to participate in the energy transition through an investment program that would add 4,800kVA of additional capacity for customers currently serviced by SWER networks. The upgrade program would include 606km of SWER to three-phase upgrades across 44 separate SWER networks.

1,310 customers would benefit from these upgrades, including 577 customers that would have their voltage performance improved to compliant levels.

This option also places us in a better position at the end of the 2026–31 regulatory period regarding the overall volume of our end-of-life SWER assets.

Given stakeholder feedback in response to our draft proposal (including from the CAP) was that the proposal did not go far enough, this option better meets the broad expectations of our customers and stakeholders.

The present value of the costs and benefits of this expenditure is summarised in table 7 below.

TABLE 7 OPTION THREE: BENEFITS ASSESSMENT SUMMARY ($M, 2026)

DESCRIPTION	PV COSTS	PV BENEFITS	NET BENEFITS
Economic SWER upgrades program	-57.3	599.9	542.5

A.2.4 Option four: accelerated SWER upgrades

This option would accelerate our SWER upgrades program further than what was considered in our draft proposal, placing more weight on equitable regional and rural outcomes over the efficiency of network investments. This option would go beyond the modelled economic sites and invest $110 million over the 2026–31 regulatory period.

This option would fast-track the improvement of regional and rural customers’ ability to participate in the energy transition, adding 7,353kVA of additional capacity for customers currently serviced by SWER networks. The upgrade program would include 1,160km of SWER to three-phase upgrades across 79 separate SWER networks. 2,117 customers would benefit from these upgrades, including 654 customers that would have their voltage performance improved to compliant levels.

It is likely this option would better meet the expectations of our customers and place us in a stronger position at the end of the 2026–31 regulatory period to consider and act on longer-term SWER challenges. Acting on longer-term objectives to upgrade SWER was an important principle shared by our customers and stakeholders.

However, this option is a material increase in expenditure relative to our draft proposal. Noting some of our customers demonstrated support for our draft proposal investment program of $45 million, viewing it as a ‘test case’ and emphasising the importance of evaluating outcomes before committing further investments.

The present value of the costs and benefits of this expenditure are summarised in table 8 below.

TABLE 8 OPTION FOUR: BENEFITS ASSESSMENT SUMMARY ($M, 2026)

DESCRIPTION	PV COSTS	PV BENEFITS	NET BENEFITS
Accelerated SWER upgrades program	-109.9	646.7	536.7

A.3 Preferred option

The preferred option for the 2026–31 regulatory period is option three, delivering an economic SWER upgrades program. We consider that option three balances customer outcomes, stakeholder expectations, long-term drivers and costs, while placing enhanced importance on the role of equitable outcomes. We consider that option three is the preferred option for the following reasons:

- relative to maintaining the status quo and our draft proposal investment program, it delivers more benefits for customers including improved voltage performance, improved capacity to electrify and connect renewable technologies, avoided failure risk and reduced bushfire risk
- responses to our draft proposal indicated that our investment program did not go far enough. We are confident that stakeholders will consider option three an improvement relative to both the status quo and our draft proposal and are likely to support it
- it is the option that maximises net economic benefits for customers, and considers the AER value of customer reliability to value forecast constraints
- it is a no-regrets investment program because it places us in a reasonable position at the end of the 2026–31 regulatory period to expand on the delivery of future regional and rural objectives. Learnings from this program can be used to enhance the effectiveness and scope of future programs.

A summary of the capital expenditure required to deliver option three is shown in table 9 below.

TABLE 9 EXPENDITURE FORECAST FOR ECONOMIC SWER UPGRADES ($M, 2026)

DESCRIPTION	FY27	FY28	FY29	FY30	FY31	TOTAL
Economic SWER upgrades program	10.7	7.3	12.7	15.6	16.8	63.1

B

IMPROVING OUTCOMES FOR WORST-SERVED CUSTOMERS

B Improving outcomes for worst served customers

Our proposed worst served customer program seeks to ensure that customers currently experiencing significantly poorer service standards are not left further behind through the energy transition, particularly as the electrification of our homes and lifestyles increases their reliance on electricity. The program is driven by both customer support and outcomes from recent Victorian Government reviews into electricity supply.

B.1 Our customers are more dependent on a safe, reliable and resilient electricity supply than ever before

The way our customers are using electricity is rapidly changing. With growing electrification, continued uptake of CER and increasing frequency and severity of extreme weather, we are more dependent on a safe, reliable and resilient electricity supply than ever before.

Collectively, the extent of electrification and growth is forecast to increase consumption by 35 per cent by 2031. Peak demand will also increase by 29 per cent, and transform many areas of our network to winter peaking.

This scale of electrification has driven the need to consider the implications for worst-served customers now, as the impacts of poorer service levels will become more acute.

B.1.1 Recent Victorian government reviews

Following extreme storm events in 2021, the Victorian Government undertook the Electricity Distribution Network Resilience Review.[20] After consulting broadly with local communities and stakeholders impacted by these extreme event, the expert panel found loss of power caused 'considerable distress' and devastating consequences on peoples lives.[21] Customers told the panel of their reliance on power in all aspects of their lives including food, water, access to funds, caring for themselves and their family and their ability to work and communicate. The panel highlighted the significant risk vulnerable and life support customers are exposed to during prolonged outages.[22]

This review has since been followed by a Network Outage Review into the more recent February 2024 storm event.[23] The review concluded that distribution businesses should proactively address worst performing feeders to reduce the number and impact of outages.[24] It also emphasised the importance of alternative solutions on the ground, such as community hubs and alternative generation to support communities.[25]

These reviews make it clear that further work needs to be undertaken by distribution businesses to improve the reliability of supply for some of our worst served customers.

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[20] More information can be found at: https://www.energy.vic.gov.au/about-energy/legislation/regulatory-reviews/electricity-distribution-network-resilience-review

[21] DEECA, Electricity Distribution Network Resilience Review, Final recommendations report, pp. 4–5

[22] DEECA, Electricity Distribution Network Resilience Review, Final recommendations report, p. 9

[23] More information can be found at: https://www.energy.vic.gov.au/about-energy/safety/network-outage-review

[24] DEECA, Network Outage Review, Final report, pp. 7-12

[25] DEECA, Network Outage Review, Final report, pp. 26-27

B.1.2 Customer's support improving supply for worst served customers

In 2024, we conducted research to understand residential and small-medium business customers' willingness to pay for discretionary service initiatives. The study involved over 500 residential and small-medium business customers.

As part of these evaluations, presented a package to reduce the annual minutes off supply for worst served customers through targeted network investments. 78 per cent of all customers supported either a $12 million program (with residential bill impacts of $0.15 per annum) or a larger $20 million program (with residential bill impacts of $0.24 per annum).

As part of our stakeholder engagement program, we have also sought to better understand what our customer expectations of us were in an electrified future. This included a focus on our regional and rural customers—who represent over 60 per cent of our customer base—with two regional and rural summits held in Creswick (2023) and Bendigo (2024).

Through this engagement, our customers expressed concern about the inequity gap between the service levels of urban and regional and rural customers. While our customers and stakeholders understand that parity in service levels is not realistic, they have repeatedly highlighted that without action, the gap in service levels will continue to widen.

B.2 Our approach

Customers throughout our engagement program expressed a strong desire to provide equal access to reliable energy for all customers, noting that reliable energy is crucial for safety and communication particularly in remote areas.

In recognition of this feedback, we identified 28 broad areas across our network that have experienced relatively poorer service levels—specifically, 700 minutes off supply and eight or more outages per annum. 700 minutes off supply is more than double that of the average rural long feeder customer.

We considered potential solutions for each of these areas that could address the current reliability outcomes, and assessed each for technical and commercial viability. In addition to this analysis, we also considered sections of our SWER network that could be replaced with stand alone power systems (SAPS) to address reliability outcomes for select customers.

B.2.1 Developed projects and programs using credible solutions and cost-benefit analysis to meet the identified need

We undertook the following steps to identify and assess options for our proposed worst served customer program. These included:

- identified areas of our network that are worst-served
- shortlisted technically and commercially credible solutions to address the identified need
- undertook cost-benefit analysis to identify the preferred solution (relative to our base case).

Figure 6 below summarises the outcomes of our area analysis, with proposed options set out thereafter (noting we are not seeking to intervene at all of these locations). We have considered how undergrounding, HV tie lines and microgrids may be utilised to improve reliability in the identified areas.

For a solution to be successful it needs to be both technically and commercially viable. For example, while undergrounding would likely improve reliability in most identified areas, the costs associated with undergrounding significant lengths of feeder lines makes this option commercially infeasible.

Based on our analysis across these areas, there are limited opportunities for us to make large scale changes to address the poorer service levels experienced in these areas. This is mostly due to the lower density of customers located in these areas. However, we have identified four areas where HV feeder ties can be installed to address reliability issues. This includes the areas of Bungal, Gordon and Mount Egerton; Trentham; Rokewood, Dereel and Corindhap; and Peterborough and Niranda South.

FIGURE 6 POTENTIAL INFRASTRUCTURE SOLUTIONS IN OUR WORST SERVED AREAS

			FIXED RESILIENCE/RELIABILITY INFRASTRUCTURE			
FEEDER	# CUSTOMERS	AREAS - TOWNS	UNDER-GROUNDING	HIGH VOLTAGE TIES	MICROGRID - BATTERY	MICROGRID - DIESEL
BAN003	4,008	Bungal, Gordon & Mt Egerton areas	✓ (yellow)	✓ (green)	✗	✗
WND024	1,039	Trentham town	✓ (yellow)	✓ (green)	✓ (yellow)	✓ (yellow)
BAN008	3,306	Daylesford, Hepburn towns	✓ (yellow)	✗	✓ (yellow)	✓ (yellow)
CLC003	2,036	Gellibrand, Beech Forest, Lavers Hill, Horden Value, Glenaire & Johanna areas	✓ (yellow)	✗	✗	✗
WND013	747	Pyalong town and area	✓ (yellow)	✗	✓ (yellow)	✓ (yellow)
GSB014	670	Mt Macedon area	✓ (yellow)	✗	✗	✗
BAS022	418	Elaine area	✓ (yellow)	✓ (yellow)	✗	✗
GHP011	203	Meredith town	✓ (yellow)	✓ (yellow)	✓ (yellow)	✓ (yellow)
CLC006 & BAS022	351	Rokewood, Dereel & Corindhap areas	✓ (yellow)	✓ (green)	✗	✗
BET005	341	Lake Eppalock area	✓ (yellow)	✗	✗	✗
CDN002	328	Carpendiet, Pomberneit & Stoneyford	✓ (yellow)	✓ (yellow)	✗	✗
WND012	322	Kerrie, Romsey	✓ (yellow)	✗	✗	✗
TRG024 & WBL012	489	Peterborough and Nirranda South area	✓ (yellow)	✓ (green)	✗	✗
CHM011	285	Apsley, Bringalbert, Langkoop & Poolajelo	✓ (yellow)	✗	✗	✗
GSB011	267	Bullengarook area	✓ (yellow)	✗	✗	✗
BAS011	262	Ballyrogan, Buangor, Burrumbeet, Beaufort, Stockyard Hill & Stoneleigh	✓ (yellow)	✗	✗	✗
FNS022	260	Little River area	✓ (yellow)	✗	✗	✗
STL005	251	Halls Gap township	✓ (yellow)	✗	✓ (yellow)	✓ (yellow)
CDN001	221	Chapple Vale, Cooriemungle, Simpson	✓ (yellow)	✗	✗	✗
CLC013	215	Wye River township	✓ (yellow)	✗	✓ (yellow)	✓ (yellow)
DDL012	214	Point Lonsdale	✓ (yellow)	✗	✗	✗
WPD022	186	Breamlea	✓ (yellow)	✗	✗	✗
BAN009	181	Ullina, Newlyn & Newlyn North areas	✓ (yellow)	✗	✗	✗
ART033	175	Carramballac, Langi Logan, Mafeking and Willaura areas	✓ (yellow)	✗	✗	✗
GHP022	173	Anakie	✓ (yellow)	✗	✗	✗

✓ (green) Technically and commercially viable ✓ (yellow) Technically viable but commercially not viable ✗ Technically and commercially not viable

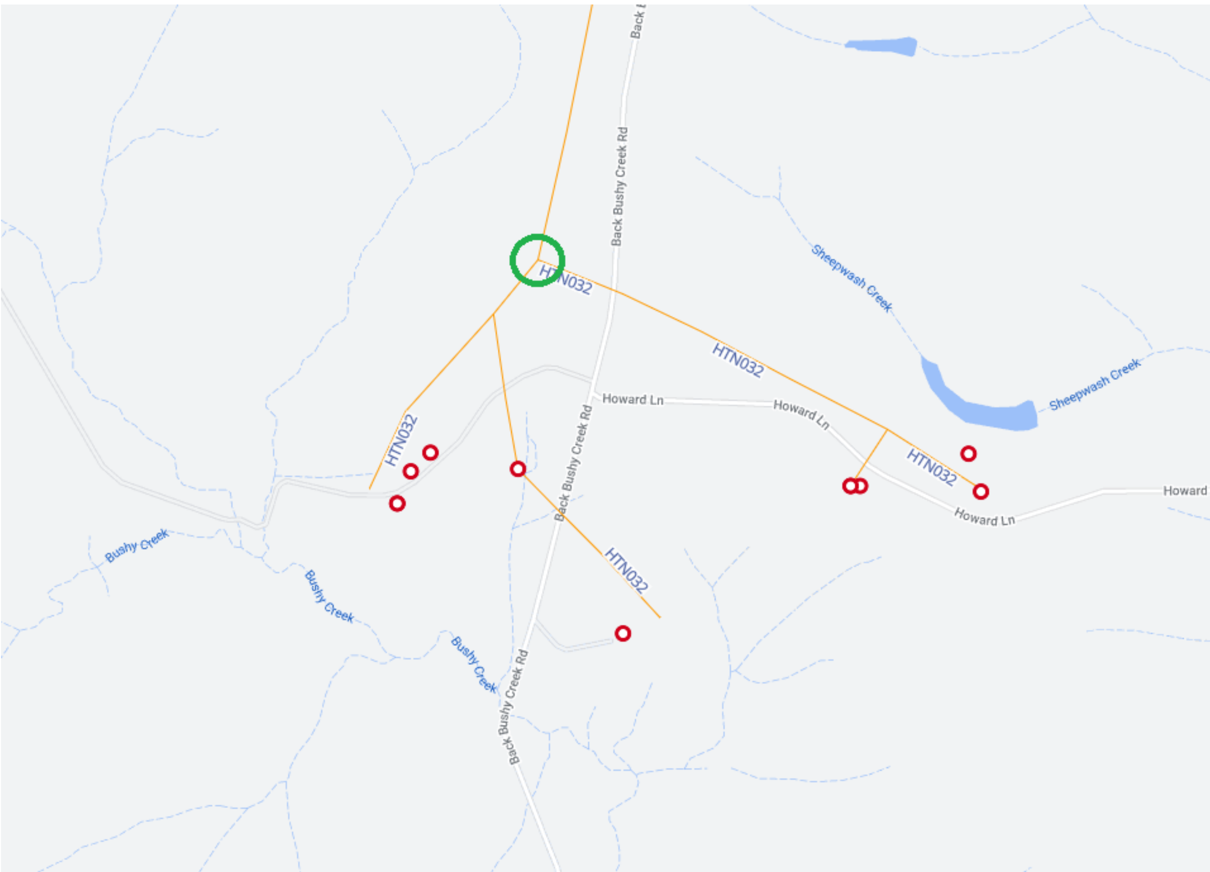
Stand alone power systems

In addition to this area analysis, we also conducted analysis across our SWER lines to identify where stand-alone power systems (SAPS) may be able to improve reliability for isolated customers.

The selection criteria was based on a nodal analysis which considered the benefits and costs of installing SAPS and retiring overhead lines for all customers downstream of a ‘node’ in the SWER network. This methodology was chosen because many of the SAPS benefits are due to the retirement of lines, which can only occur if all the customers downstream of a node are disconnected from the electricity grid.

Nodes which were selected typically had a combination of high bushfire risk, high vegetation management costs, and long lengths of overhead lines supplying few customers and poor reliability.

FIGURE 7 EXAMPLE NODE (GREEN CIRCLE) AND CUSTOMERS DOWNSTREAM



The nodal analysis, identified 44 nodes with 71 SAPS which were economically viable. However, since SAPS are relatively new in Victoria, we are only proposing to install 17 SAPS in the next regulatory period. We expect to expand the SAPS portfolio in the following regulatory period once we have a demonstrated track record of integrating these into our systems, to provide customers greater confidence on service level outcomes associated with this approach.[26]

26 For further details see PAL ATT 3.07 – SAPS methodology – Jan 2025 – Public. Economically viable nodes identified in the methodology document are greater than those proposed in this business case. This is due to the addition of IT expenditure required to monitor and operate the SAPS (which was not included in the original methodology, but is considered in our analysis). Inclusion of this expenditure has reduced the number of economically viable SAPS.

B.2.2 In considering worst served customer investments we have included values related to network resilience and worst served customers

In assessing potential worst served investments we have included the AER's recently released value of network resilience as well as our own value for worst served customers.

Our value for worst served customers

We have included a worst-served customer value for customers and communities that are particularly exposed to extreme weather events and who have experienced significantly more minutes off supply than our average customer.

On average, between 2015 and 2023, 22,572 customers experienced more than 500 minutes of power outages annually (approximately 2.5 per cent of our total customer base). This outage duration is 3.7 times greater than that of our average customer.

Given there is a sub-set of our customers who are experiencing consistently lower service standards, we applied a worst-served customer value to our resilience investments where the average annual minutes off supply is greater than 500. The value, which was developed with our customers, is set at $22.30/kWh.

The interaction of the value of customer reliability (VCR), worse served customer value and value of network resilience (VNR) is as follows:

- 0 - 500 minutes off supply – VCR is applied
- 500 - 720 minutes off supply – VCR and worst served customer values are applied
- 720+ minutes off supply – VNR is applied

Development of our customer values

In 2021, we completed a significant body of work with our customers to develop an estimate of the value they place on various services, such as network resilience and enabling solar exports. These values were designed to be additive to other value measures, such as the AER's value of customer reliability (VCR).

We were the first network business in Australia to incorporate such values into our internal investment assessment approach. That is, these values are now contributing to the prioritisation of our capital program to help investments align with our customers' expectations.

At the recommendation of the Customer Advisory Panel (CAP), these values were re-tested and updated in 2023 to ensure they remain reflective of our customer's views. This was undertaken given the economic environment had changed materially, and there was a question of whether customer's preferences had evolved as well. Values produced during this re-testing were very similar to the initial values produced in 2021, demonstrating that customer's continued to value these services.

Table 10 below describes each of our customer values.

TABLE 10 CUSTOMER VALUES

VALUE MEASURE	DESCRIPTION
Reliability in worst-served areas	Customer value of enhancing reliability in worst-served areas of our network, based on kWh of avoided outages
Enabling solar exports	Customer value of avoided rooftop solar constraints
Community resilience	Customer value of enhancing community support during long-duration outages caused by extreme weather. This includes emergency response vehicles and community liaison officers
Customer time	Customer value of time saved by customers on a per-minute basis
Battery storage in local community	Customer value of local battery energy storage systems to optimise the use of locally generated clean energy resources

AER's value of network resilience

The AER released its final decision on an interim value for network resilience on 30 September 2024. The interim VNR was developed to help inform networks and stakeholders about the appropriate investments to enhance network and community resilience against extreme weather events. The AER has timetabled a longer-term VNR that will supersede the interim VNR for 2026.

We have applied the interim VNR for our resilience investments in place of our own values of network and community resilience. The VNR uses multiples of the value of customer reliability (VCR) to account for the additional costs borne by customers during prolonged outages. The VNR has been applied as follows:

- for residential customers:
  - the standard VCR for the first 12 hours of a prolonged outage
  - a multiple of 2x the standard VCR for the period of 12-24 hours
  - a multiple of 1.5x the standard VCR for the duration of the outage that extends beyond 24 hours, until the upper bound is reached (the upper bound for an average customer is expected to be reached after approximately seven days)
- for business customers:
  - the standard VCR for the first 12 hours of a prolonged outage
  - a multiple of 1.5x the standard VCR for the period of 12-24 hours
  - a multiple of 1.0x the standard VCR for the period of 24-72 hours (1-3 days)
  - a multiple of 0.5x the standard VCR for the duration of the outage that extends beyond 72 hours.

B.2.3 Our proposed expenditure

The remainder of this document sets out the individual business cases that make up our proposed worst served customer expenditure, including our proposed SAPS. These business cases should be read with consideration of the material included in the initial sections of this document.

Table 11 provides a summary of our investments including the identified need and associated costs.

TABLE 11 SUMMARY OF WORST SERVED CUSTOMER INVESTMENTS ($M, 2026)

INVESTMENTS	IDENTIFIED NEED	CAPEX
Trentham supply area	Prevent deterioration of supply to the Trentham supply area	3.5
Gordon, Mount Egerton and Bungal supply area	Prevent deterioration of supply to the Gordon, Mount Egerton and Bungal supply area	3.1
Rokewood, Dereel and Corindhap supply area	Prevent deterioration of supply to the Rokewood, Dereel and Corindhap supply area	5.4
Peterborough and Niranda South supply area	Prevent deterioration of supply to the Peterborough and Niranda South supply area	2.6
Stand alone power systems	Prevent deterioration of supply for end of SWER line customers	3.7
Total		**18.4**

Reliability target adjustments

We have not adjusted our reliability targets for improved reliability related to our proposed worst served investments. There are a number of drivers for this decision, including:

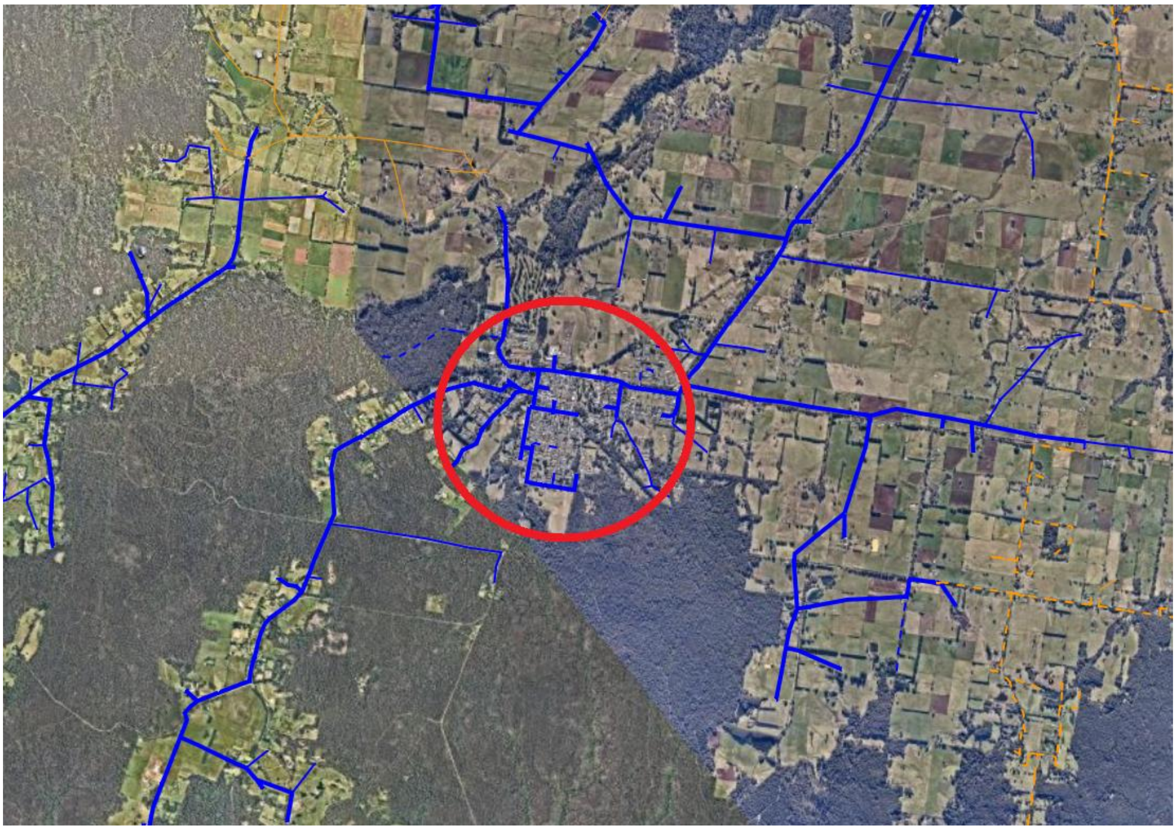
- the limited number of customers addressed by these investments. Our reliability targets are set using average minutes off supply for all customers. As only a small number of customers are being addressed by our worst served investments, any reduction in minutes off supply attributable to these customers will not materially impact the average across the network.
- the increasing frequency and severity of extreme weather events. These events are likely to lead to further deterioration of service levels for our regional and rural customers. This creates uncertainty as to whether the proposed worst served investments will lead to reductions in minutes off supply, or will simply prevent further deterioration in service levels for these customers.

B.3 Trentham supply area

Trentham is an inland town located 87km north-west of Melbourne. The town is supplied by a single HV feeder (WND024) which runs between Woodend via Tylden to Trentham. The feeder then travels southwards to Blackwood. WND024 consists of over 146km of overhead 22KV HV line and 25km of underground 22KV HV cable.

The feeders connecting to and within Trentham supply area are shown in the figure below.

FIGURE 8 TRENTHAM SUPPLY AREA



B.3.1 Identified need

Based on outage data from the last five years, the WND024 feeder supplying Trentham has experienced an average of eight outage events per year, with an average outage duration of 727 minutes. This is significantly higher than the average across our network.

Faults on WND024 occur over the full length of the feeder. Typical causes include weather, equipment failure and vegetation. With the introduction of the REFCL at WND zone substation, faults anywhere on the WND024 22KV network may cause the entire WND024 feeder to trip.

Trentham is susceptible to frequent and prolonged outages as a large proportion of the WND024 feeder is exposed to significant vegetation and there is no tie to adjacent feeders.

Given the duration and frequency of outages in the Trentham supply area are well above the averages experienced across our network, we are seeking to prevent any further deterioration in supply in this area.

B.3.2 Options analysis

We have considered a number of potential options to address the supply risk to the Trentham area from outages of the incoming HV feeders. In addition to the base case, credible options are those that are economically able to meet the identified need, meaning the solution is both technically and economically feasible. Credible options were progressed to option evaluation, and a summary of options costs is shown in table 12.

TABLE 12 SUMMARY OF COSTS ($M, 2026)

OPTION	COST
Option one: base case	-
Option two: diesel generator microgrid	3.2
Option three: diesel generator and BESS microgrid	7.0
Option four: HV tie line	3.5
Option five: undergrounding	N/A

Option one: base case

This option assumes that there is no additional investment for improving network service levels for the Trentham area. Reliability outcomes for the Trentham area are expected to remain significantly worse than network averages.

Option two: install diesel generator microgrid

This option is to procure and install a diesel powered generator in the Trentham township which will provide the township with an alternative supply source during outage events. The generator will be located at a suitable area within the township and connected to the HV network. The generator is sized at 2MW so that it can cover the peak demand of the selected microgrid area. Fuel storage has been sized to allow for 48 hours of running time before a refuel is required.

In the event of an outage of the WND024 feeder, the automatic circuit recloser (ACR) upstream of the township will open and isolate the township from the main electrical grid. The diesel generator is able to be started within minutes to supply the township with electricity in the event of an outage.

On the conclusion of the outage, the generator can be powered down, the ACR closed and the township reverted to power from the grid.

Option three: install diesel generator and BESS microgrid

This option is to procure and install a battery energy storage system (BESS) as well as a diesel powered generator in the Trentham township. Both assets will be installed at a suitable area within the township and connected to the HV network.

The battery is sized at 2MWh which can power the township for an average of six hours assuming it is fully charged.

The generator is sized at 2MW so that it can cover the peak demand of the selected microgrid area. Fuel storage has been sized to allow for 48 hours of running time before a refuel is required.

The microgrid operates in two different modes. During an outage, the township is 'islanded' from the electricity grid as the ACR upstream of the town opens. The microgrid would then provide an alternative supply source to customers primarily through the BESS in shorter outages. The diesel generator would be utilized in extend outages and when the demand in the township exceeds what the BESS can supply.

In the absence of a feeder outage, the BESS has the potential to operate in grid connected mode where it provides additional benefit streams through participating in energy markets, as well as storing excess solar exports of customers for use during non-generating hours.

Option four: HV tie line

This option would install a HV tie line between the WND024 and BAN003 feeders to allow supply to continue to flow in the event one feeder suffers an outage.

The new tie will consist of 3km of new HV overhead line, 0.3km of underground HV cable, upgrading of 5.2km of existing HV tie line, the installation of one voltage regulator and the installation of three automated switching devices.

The tie line will allow for customers in the Trentham area to be supplied from an alternative HV feeder in the event of an outage. Automation switching equipment will facilitate the rapid restoration of customers via the alternative feeder.

The new feeder tie and automated switches will allow the automated restoration of Trentham for faults on the WND024 and BAN003 feeders and will significantly reduce the duration of an outage.

Option five: undergrounding

To significantly improve the reliability of the WND024 feeder, over 25km of overhead conductor would need to be undergrounded. Undergrounding such a large segment of the feeder would have a substantial capital cost making this option uneconomic.

Undergrounding only small sections of feeder would not significantly improve the resilience and reliability of the feeder, as any faults on the remaining overhead sections of the lines will still be exposed to the same outage risk during extreme weather events.

Due to this option not being considered credible for the identified need we have not estimated the capital cost of this option.

B.3.3 Option evaluation

The credible options were evaluated using a cost benefit analysis. The cost benefit analysis compares the capital and operating expenditure of the options against the quantified benefits of undertaking each option.

The main quantified benefit relates to the reduction in the energy at risk for customers in the supply area. A reduction in energy at risk will lead to an increase in the reliability of supply for customers within the supply area. Energy at risk has been calculated using historical outage data specific to the Trentham supply area over the past five years.

Values of network resilience (VNR) and worst served customers have been considered in conjunction with the standard value of customer reliability (VCR) to quantify this benefit.[27] We have ensured that there is no overlap between our worst served customer value and the AER's VNR, prioritising the use of the VNR when applicable.

[27] See section B.2.2 for further details on the values included in our resilience business cases

The benefit streams associated with BESS market participation have been included based on the estimated value of leasing the BESS to a retailer, given potential regulatory constraints around distribution networks operating in BESS related markets.

We have applied wind escalation to historical outages to project the impact of climate change. This is based on the methodology developed by AECOM, which estimates changes in the number of days with wind gusts above 100km/h.[28] Gusts above 100km/h are most likely to cause damage to our network assets and result in customer being taken off supply.

The analysis was undertaken over a 20-year time period to align with the expected life of the assets.

B.3.4 Results summary

Table 13 shows the results of the option evaluation against our base case. Option four is the preferred option, with further detail provided in our attached model.[29]

TABLE 13 OPTION EVALUATION RESULT ($M, 2026)

OPTION	PV COST	PV BENEFITS	NET BENEFITS
Option two: install diesel generator microgrid	3.3	9.0	5.6
Option three: install diesel generator and BESS microgrid	7.4	9.0	1.5
Option four: install a HV tie line	1.9	19.6	17.7

Sensitivity analysis was also used to test the robustness of the central scenario results.

Sensitivities relating to capital expenditure and wind escalation have been undertaken. Capital expenditure sensitivities have been included to ensure that the options are robust to movements in both cost increases and decreases. Wind escalation sensitivities have been included as wind is a key cause of outages during extreme weather events. Wind is notoriously hard to model, and this inherent uncertainty is only increasing as the climate changes. While we have included our best available wind estimates, we have also included sensitivities that account for no wind escalation and additional wind escalation.

Option four maintains a positive net present value under all sensitivity scenarios and remains the preferred option under all scenarios.

B.3.5 Preferred option

The preferred option—option four—is to install a new HV tie line between WND024 and BAN003 feeders. The new tie will consist of 3km of new HV overhead line, 0.3km of underground HV cable, upgrading of 5.2km of existing HV tie line, the installation of one voltage regulator and the installation of three automated switching devices.

The route of the new HV feeder tie is proposed in figure 9.

28 PAL ATT 5.01 – AECOM - Methodology report – Jan2025 – Public
29 PAL MOD 3.25 – worst served customers BAN-WND – Jan2025 – Public

The installation of this option would result in a reduction in unserved energy of 19 MWh for customers in the Trentham supply area.

FIGURE 9 PROPOSED TIE LINE

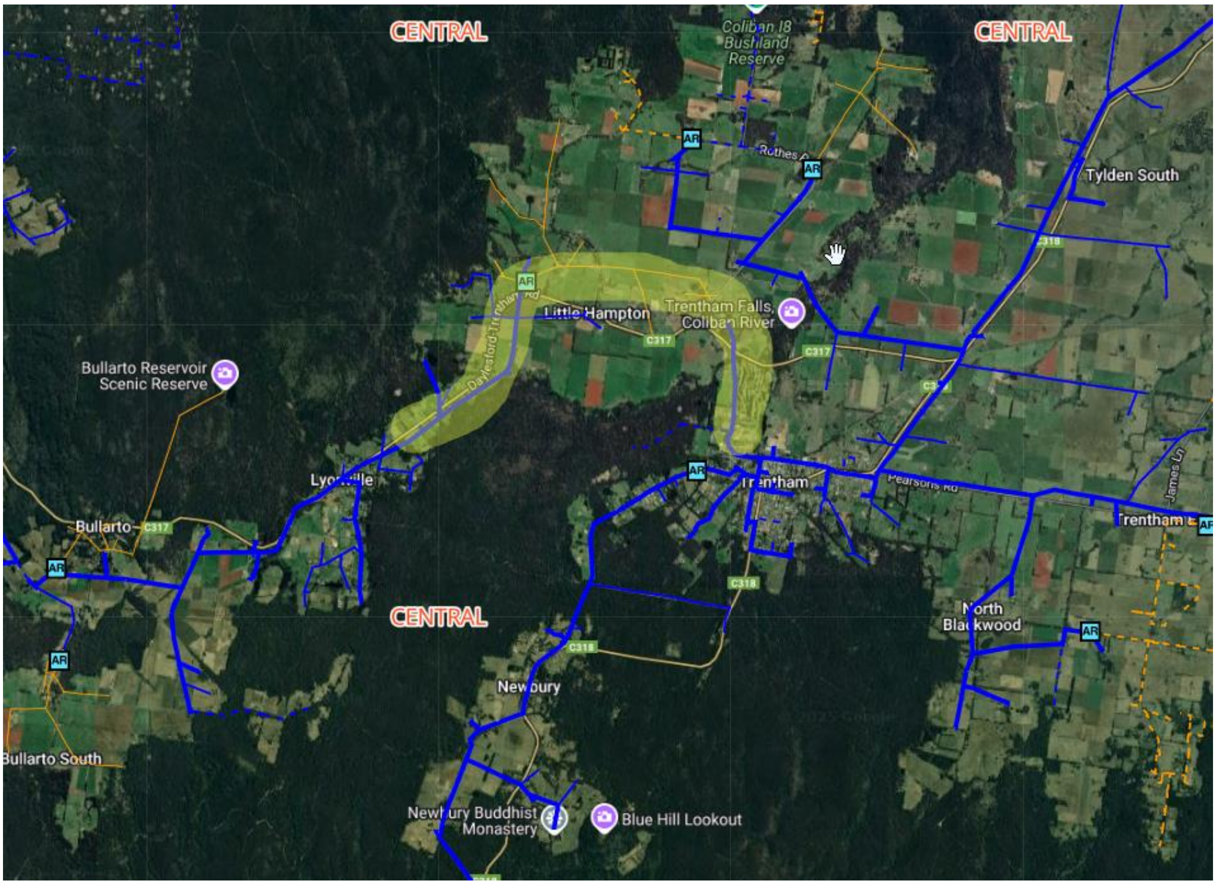


Table 14 outlines the proposed capital expenditure for the new tie line over the next regulatory period.

TABLE 14 INSTALLATION OF TIE LINE ($M, 2026)

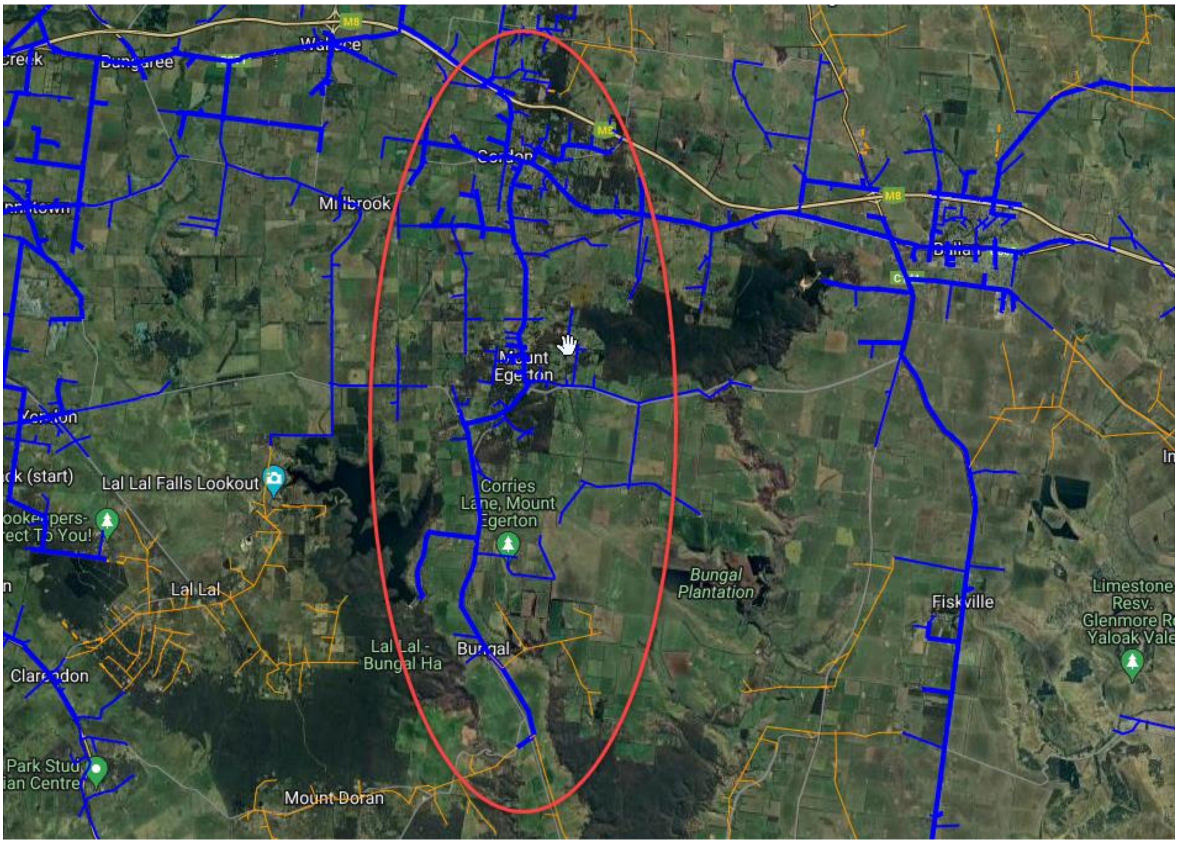
OPTION	FY27	FY28	FY29	FY30	FY31	TOTAL
Install a HV tie line	0.6	3.0	-	-	-	3.5

B.4 Gordon, Mount Egerton and Bungal supply area

Gordon, Mount Egerton and Bungal are rural towns/communities, located within the Central Highlands region of Victoria. The 1,250 customers in the Gordon, Mount Egerton and Bungal communities are supplied by the BAN003 feeder from Ballarat North with limited backup supply from the BMH003 feeder from Bacchus Marsh. Both feeders traverse forested areas and are vulnerable to tree falls, bushfires, and extreme weather events. BAN003 feeder consists of over 387km of overhead 22KV HV line and 21km of underground 22KV HV cable and BMH003 feeder consists of over 197km of overhead 22KV HV line and 9km of underground 22KV HV cable. Due to the long sections of powerlines which travel through this terrain, there can also be accessibility issues when responding to both reliability and resilience events.

The feeders connecting to and within Gordon, Mount Egerton and Bungal supply area are shown in the figure below.

FIGURE 10 GORDON, MOUNT EGERTON AND BUNGAL SUPPLY AREA



B.4.1 Identified need

Based on outage data from the last five years, the BAN003 feeder supplying Gordon, Mount Egerton and Bungal areas experienced an average of ten outage events per year, with a total duration of 1285 minutes.

Faults on BAN003 occur over the full length of the feeder, particularly in the areas surrounded by trees. The two main causes of outages are vegetation and weather. Vegetation related outages occur due to trees falling onto the line because of windblown bark and branches. Weather related outages occur due to wind damage, lighting strikes and other storm related damage.

The adjoining feeder BMH003 has a limited capacity to supply this area and make these communities susceptible to longer and more frequent outages.

Given the duration and frequency of outages in the Gordon, Mount Egerton and Bungal supply area are well above the averages experienced across our network, we are seeking to prevent any further deterioration in supply in this area.

B.4.2 Options analysis

We have considered a number of potential options to address the supply risk to the Gordon, Mount Egerton and Bungal area from outages of the incoming HV feeders. In addition to the base case, credible options are those that are economically able to meet the identified need, meaning the solution is both technically and economically feasible. Only option four was considered credible to meet the identified need.

Option one: base case

This option assumes that there is no additional investment for improving network service levels for the Gordon, Mount Egerton and Bungal area. Reliability outcomes for the Gordon, Mount Egerton and Bungal area are expected to remain significantly worse than network averages

Option two: install diesel generator microgrid

This option involves installing a diesel generator microgrid in either Gordon or Mt Egerton townships to improve reliability. The generator will be located at a suitable area within the township and connected to the HV network.

In the event of an outage on the BAN003 feeder, the automatic circuit recloser (ACR) upstream of the township will open and isolate the township from the main electrical grid. The diesel generator is able to be started within minutes to supply the township with electricity in the event of an outage.

This option was discounted due to the low density of customers and essential services in either the Gordon or Mount Egerton township. A microgrid is only able to cover a small geographic area as it relies on fault events not affecting the electrical assets within the microgrid boundary. This solution is ideal for townships where there is dense housing with minimal vegetation or areas which have many community facilities which would benefit the wider area in the event of a prolonged outage.

A microgrid solution is not appropriate as it would only benefit a small percentage of the customers in the Gordon, Mount Egerton and Bungal Supply Area. Expanding the microgrid to encompass more customers would make it susceptible to the same outage events as the current feeders.

Due to this option not being considered credible for the identified need we have not estimated the capital cost of this option.

Option three: install diesel generator and BESS microgrid

This option is to procure and install a battery energy storage system (BESS) as well as a diesel powered generator in either the Gordon or Mount Egerton township. Both assets will be installed at a suitable area within the township and connected to the HV network.

The microgrid operates in two different modes. During an outage, the township is "islanded" from the electricity grid as the ACR upstream of the town opens. The microgrid would then provide an alternative supply source to customers primarily through the BESS in shorter outages. The diesel generator would be utilized in extend outages and when the demand in the township exceeds what the BESS can supply.

In the absence of a feeder outage, the BESS has the potential to operate in grid connected mode where it provides additional benefit streams through participating in energy markets, as well as storing excess solar exports of customers for use during non-generating hours.

This option was discounted for the same reasons as option two. Due to this option not being considered credible for the identified need we have not estimated the capital cost of this option.

Option four: HV tie line

This option would upgrade the HV tie line between the BAN003 and BMH003 feeders to improve reliability in the event one feeder suffers an outage.

The current tie line has limited capacity to back-feed into the Gordon, Mount Egerton and Bungal supply area.

The tie line upgrade will allow for customers in the Gordon, Mount Egerton and Bungal area to have improved supply from an alternative HV feeder in the event of an outage. Automation switching equipment will be installed to facilitate the rapid restoration of customers via the alternative feeder. This will significantly reduce the duration of an outage.

The capital cost of this option is $3.1m.

Option five: undergrounding

To significantly improve the resilience of the BAN003 feeder against outage events, over 26km of overhead conductor would need to be undergrounded from Ballarat North to the edge of Gordon. Undergrounding such a large segment of the feeder would have a substantial capital cost making this option uneconomic.

Undergrounding only small sections of feeder would not significantly improve the resilience and reliability of the feeder, as any faults on the remaining overhead sections of the lines will still be exposed to the same outage risk during extreme weather events.

Due to this option not being considered credible for the identified need we have not estimated the capital cost of this option.

B.4.3 Option evaluation

The credible options were evaluated using a cost benefit analysis. The cost benefit analysis compares the capital and operating expenditure of the options against the quantified benefits of undertaking each option.

The main quantified benefit relates to the reduction in the energy at risk for customers in the supply area. A reduction in energy at risk will lead to an increase in the reliability of supply for customers within the supply area. Energy at risk has been calculated using historical outage data specific to the Gordon, Mount Egerton and Bungal supply area over the past five years.

Values of network resilience (VNR) and worst served customers have been considered in conjunction with the standard value of customer reliability (VCR) to quantify this benefit.[30] We have ensured that there is no overlap between our worst served customer value and the AER's VNR, prioritising the use of the VNR when applicable.

The benefit streams associated with BESS market participation have been included based on the estimated value of leasing the BESS to a retailer, given potential regulatory constraints around distribution networks operating in BESS related markets.

The analysis was undertaken over a 20-year time period to align with the expected life of the assets.

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[30] See section B.2.2 for further details on the values included in our resilience business cases

B.4.4 Results summary

Table 15 shows the results of the option evaluation against our base case. Option four is the preferred option, with further detail provided in our attached model.[31]

TABLE 15 OPTION EVALUATION RESULT ($M, 2026)

OPTION	PV COST	PV BENEFITS	NPV
Option four: install a HV tie line	1.6	10.8	9.1

Sensitivity analyis was also used to test the robustness of the central scenario results.

Sensitivities relating to capital expenditure total benefits have been undertaken. Capital expenditure sensitivities have been included to ensure that the options are robust to movements in both cost increases and decreases. Benefit sensitivities have been included to ensure that the options are robust to changes on energy at risk, the main quantified benefit in this business case.

Option four maintains a positive net present value under all sensitivity scenarios and remains the preferred option under all scenarios.

B.4.5 Preferred option

The preferred option—option four— is to upgrade the existing HV tie from Bacchus Marsh. This involves the upgrading of 14 km of existing HV line and the installation of two new automated switching devices.

The route of the new HV feeder tie is proposed in Figure 11.

The installation of this option would result in a reduction in unserved energy of 10.3 MWh for customers in the Gordon, Mount Egerton and Bungal supply area.

31 PAL MOD 3.24 – worst served customers BAN-BMH – Jan2025 – Public

FIGURE 11 PROPOSED TIE LINE

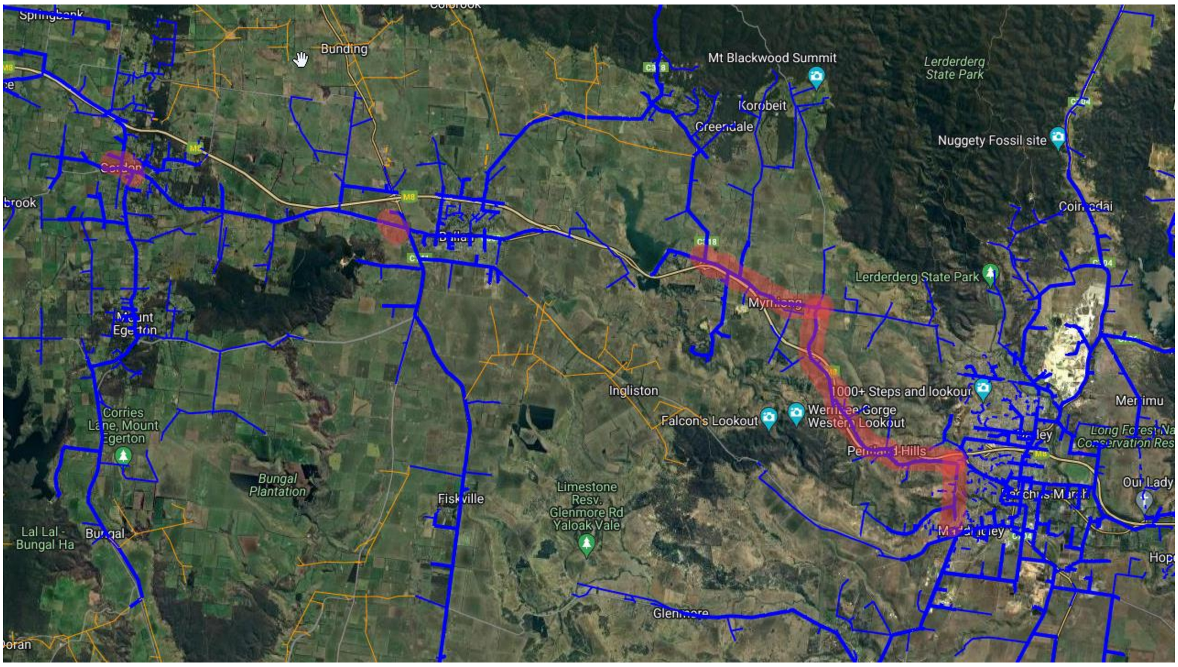


Table 16 outlines the proposed capital expenditure for the new tie line over the next regulatory period.

TABLE 16 INSTALLATION OF TIE LINE ($M, 2026)

OPTION	FY27	FY28	FY29	FY30	FY31	TOTAL
Install a HV tie line	0.3	1.6	1.3	-	-	3.1

B.5 Rokewood, Dereel and Corindhap supply area

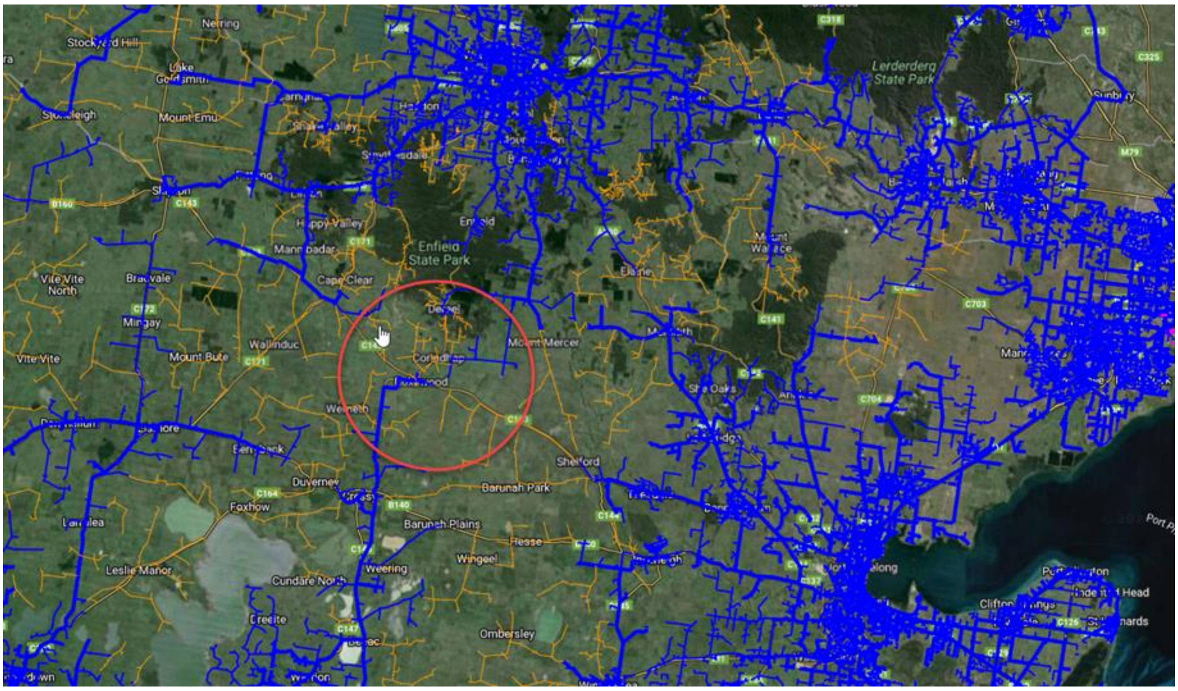
Rokewood, Dereel and Corindhap are rural communities located within the Baron and Central Highlands region of Victoria. The Rokewood community is supplied by the CLC006 feeder from Colac and the Dereel and Corindhap communities from BAS022 feeder from Ballarat South. Both feeders are vulnerable to tree falls, bushfires, and extreme weather events.

The CLC006 feeder consists of over 297km of overhead 22KV HV line and 3km of underground 22KV HV cable and traverses mostly open grazing/agricultural area. The feeder does not have any feeder ties north of Beeac which is halfway between Colac and Rokewood, making it a radial supply after this point.

The BAS022 feeder consists of over 336km of overhead 22KV HV line and 7km of underground 22KV HV cable and traverses both open grazing land as well as tree forests/plantations. The section of BAS022 that supplies Dereel/Corindhap is a radial supply from Buninyong down to these communities. Due to the long sections of powerlines which travel through this terrain, there can also be accessibility issues when responding to both reliability and resilience events.

The feeders connecting to and within the Rokewood-Dereel-Corindhap supply area are shown in the figure below.

FIGURE 12 ROKEWOOD, DEREEL AND CORINDHAP SUPPLY AREA



B.5.1 Identified need

Based on outage data from the last five years, the CLC003 feeder customers in the Rokewood community experienced an average of seven outage events per year, with a total average duration of 1,199 minutes per year. The BAS022 feeders customers in the Dereel and Corindhap communities experienced an average of five outages per year, with a total average duration of 570 minutes per year. Combined this is significantly higher than the average across our network.

Both sections of the BAS022 and CLC003 feeders that service these communities are radial HV supplies. This means that these communities experience a higher that average number of faults and average fault duration and are often the last customers to be restored.

Faults on the BAS022 and CLC003 feeders occur over the full length of each feeder. The two main causes of outages are vegetation and weather. Vegetation related outages occur due to trees falling onto the line because of windblown bark and branches. Weather related outages occur due to wind damage, lighting strikes and other storm related damage.

Given the duration and frequency of outages in the Rokewood, Dereel and Corindhap supply area are well above the averages experienced across our network, we are seeking to prevent any further deterioration in supply in this area.

B.5.2 Options analysis

We have considered a number of potential options to address the supply risk to the Rokewood, Dereel and Corindhap area area from outages of the incoming HV feeders. In addition to the base case, credible options are those that are economically able to meet the identified need, meaning the solution is both technically and economically feasible. Only option four was considered credible to meet the identified need.

Option one: base case

This option assumes that there is no additional investment for improving network service levels for the Rokewood, Dereel and Corindhap area. Reliability outcomes for the Rokewood, Dereel and Corindhap area are expected to remain significantly worse than network averages .

Option two: install diesel generator microgrid

This option involves installing a diesel generator microgrid in either Rokewood or Dereel township to improve reliability. The generator will be located at a suitable area within the township and connected to the HV network.

In the event of an outage on the CLC003 or BAS022 feeder, the automatic circuit recloser (ACR) upstream of the township will open and isolate the township from the main electrical grid. The diesel generator is able to be started within minutes to supply the township with electricity in the event of an outage.

This option was discounted due to the low density of customers and essential services in either the Rokewood or Dereel township. A microgrid is only able to cover a small geographic area as it relies on fault events not affecting the electrical assets within the microgrid boundary. This solution is ideal for townships where there is dense housing with minimal vegetation or areas which have many community facilities which would benefit the wider area in the event of a prolonged outage.

A microgrid solution is not appropriate as it would only benefit a small percentage of the customers in the Rokewood, Dereel and Corindhap supply area. Expanding the microgrid to encompass more customers would make it susceptible to the same outage events as the current feeders.

Due to this option not being considered credible for the identified need we have not estimated the capital cost of this option.

Option three: install diesel generator and BESS microgrid

This option is to procure and install a battery energy storage system (BESS) as well as a diesel powered generator in either the Rokewood or Dereel township. Both assets will be installed at a suitable area within the township and connected to the HV network.

The microgrid operates in two different modes. During an outage, the township is "islanded" from the electricity grid as the ACR upstream of the town opens. The microgrid would then provide an alternative supply source to customers primarily through the BESS in shorter outages. The diesel generator would be utilized in extend outages and when the demand in the township exceeds what the BESS can supply.

In the absence of a feeder outage, the BESS has the potential to operate in grid connected mode where it provides additional benefit streams through participating in energy markets, as well as storing excess solar exports of customers for use during non-generating hours.

This option was discounted for the same reasons as option two. Due to this option not being considered credible for the identified need we have not estimated the capital cost of this option.

Option four: HV tie line

This option would install a HV tie line between the CLC006 and BAS022 feeders to allow supply to continue to flow in the event one feeder suffers an outage.

The new tie will consist of 3km of new HV overhead line, upgrading of 20km of existing HV time and the installation of three automated switching devices.

The tie line will allow for customers in the Rokewood, Dereel and Corindhap areas to be supplied from an alternative HV feeder in the event of an outage. Automation switching equipment will be installed to facilitate the rapid restoration of customers via the alternative feeder.

The new feeder tie and automated switches will allow the automated restoration of the Rokewood, Dereel and Corindhap communities for faults on CLC006 and BASA022 feeders and will significantly reduce the duration of an outage.

The capital cost of this option is $5.4m.

Option five: undergrounding

This option would involve the installation of significant lengths of HV underground cable along the CLC006 and BAS022 feeders.

CLC006 feeder which supplies Rokewood consists of over 297km of overhead HV line and BAS022 which supplied Dereel/Corindhap consists of over 336km of HV line. The sections CLC006 from Colac to Rokewood is approximately 50 km long and would need significant sections moved to underground to have a material effect on the reliability of the supply to the Rokewood area. The section from Ballarat South to Dereel/Corindhap is approximately 42 km long and would need significant sections moved to underground to have a material effect on the reliability of the supply to the Dereel/Corindhap area.

Due to this option not being considered credible for the identified need we have not estimated the capital cost of this option.

B.5.3 Option evaluation

The credible options were evaluated using a cost benefit analysis. The cost benefit analysis compares the capital and operating expenditure of the options against the quantified benefits of undertaking each option.

The main quantified benefit relates to the reduction in the energy at risk for customers in the supply area. A reduction in energy at risk will lead to an increase in the reliability of supply for customers within the supply area. Energy at risk has been calculated using historical outage data specific to the Rokewood, Dereel and Corindhap supply area over the past five years.

Values of network resilience (VNR) and worst served customers have been considered in conjunction with the standard value of customer reliability (VCR) to quantify this benefit.[32] We have ensured that there is no overlap between our worst served customer value and the AER’s VNR, prioritising the use of the VNR when applicable.

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[32] See section B.2.2 for further details on the values included in our resilience business cases

The benefit streams associated with BESS market participation have been included based on the estimated value of leasing the BESS to a retailer, given potential regulatory constraints around distribution networks operating in BESS related markets.

The analysis was undertaken over a 20-year time period to align with the expected life of the assets.

B.5.4 Results summary

Table 17 shows the results of the option evaluation against our base case. Option four is the preferred option, with further detail provided in our attached model.[33]

TABLE 17 OPTION EVALUATION RESULT ($M, 2026)

OPTION	PV COST	PV BENEFITS	NPV
Option four: install a HV tie line	2.8	5.4	2.6

Sensitivity analysis was also used to test the robustness of the central scenario results.

Sensitivities relating to capital expenditure total benefits have been undertaken. Capital expenditure sensitivities have been included to ensure that the options are robust to movements in both cost increases and decreases. Benefit sensitivities have been included to ensure that the options are robust to changes on energy at risk, the main quantified benefit in this business case.

Option four maintains a positive net present value under all sensitivity scenarios and remains the preferred option under all scenarios.

B.5.5 Preferred option

The preferred option—option four— is to install a new HV tie line between CLC006 and BAS022 feeders. This involves the installation of 3km of new HV line, the upgrading of 20km of existing HV line and the installation of three new automated switching devices.

The route of the new HV feeder tie is proposed in in figure 13.

The installation of this option would result in a reduction in unserved energy of 5.2 MWh for customers in the Rokewood, Dereel and Corindhap supply area.

33 PAL MOD 3.26 – worst served customers CLC-BAS – Jan2025 – Public

FIGURE 13 PROPOSED TIE LINE

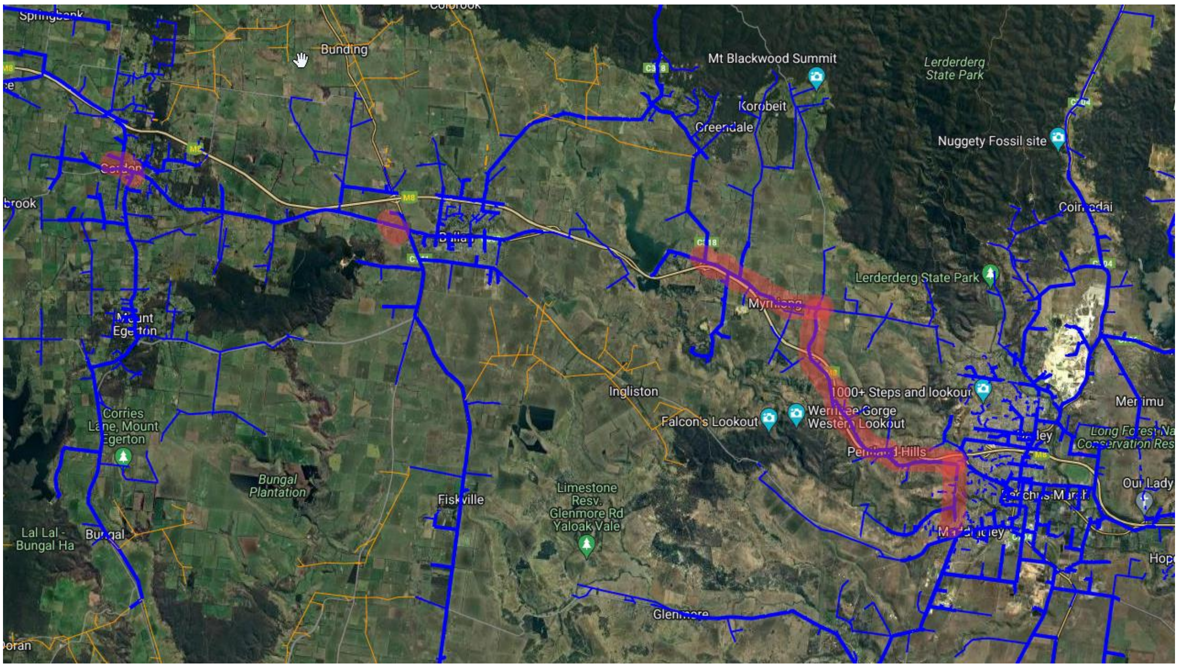


Table 18 outlines the proposed capital expenditure for the new tie line over the next regulatory period.

TABLE 18 INSTALLATION OF TIE LINE ($M, 2026)

OPTION	FY27	FY28	FY29	FY30	FY31	TOTAL
Install a HV tie line	-	0.9	3.7	0.8	-	5.4

B.6 Peterborough and Nirranda supply area

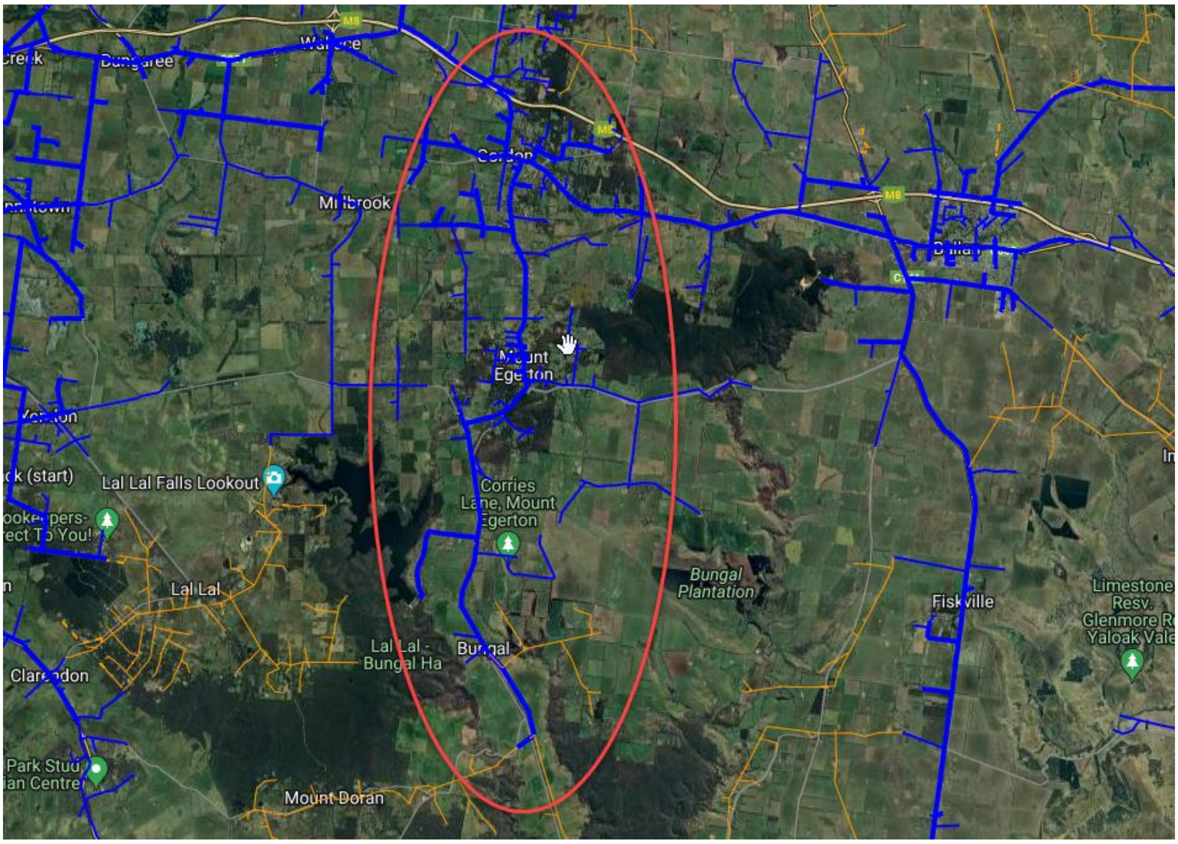
The Peterborough and Nirranda South rural towns/communities are located within the Great South West region of Victoria. The Peterborough township/community is supplied by the TRG024 feeder from Terang and the Nirranda South community from WBL012 feeder from Warrnambool. Both feeders are vulnerable to tree falls, bushfires, and extreme weather events.

The TRG024 feeder consists of over 207km of overhead 22KV HV line and 1km of underground 22KV HV cable and traverses mostly open grazing/agricultural areas and does not have any feeder ties to the west of Peterborough.

The WBL012 feeder consists of over 212km of overhead 22KV HV line and 5km of underground 22KV HV cable and traverses both open grazing land and is exposed to the weather conditions straight off Bass Strait. Due to the configuration of powerlines which travel through this terrain, there can be accessibility issues when responding to both reliability and resilience events.

The feeders connecting to and within the Peterborough-Nirranda South supply area are shown in the figure below.

FIGURE 14 PETERBOROUGH AND NIRRANDA SOUTH SUPPLY AREA



B.6.1 Identified need

Based on outage data from the last five years, the TRG024 feeder customers in the Peterborough community experienced an average of six outage events per year, with a total duration of 848 minutes per year. The WBL012 feeder customers in the Nirranda South community experienced an average of six outages per year, with a total average duration of 937 minutes per year. Combined, this is significantly higher than the average across our network.

Both sections of the TRG024 and WBL012 feeders that service these communities are radial HV supplies. This means these communities experience a higher than average number of faults and average fault duration and are often the last customers to be restored.

Faults on the TRG024 and WBL012 feeders occur over the full length of each feeder. The two main causes of outages are vegetation and weather. Vegetation related outages occur due to trees falling onto the line because of windblown bark and branches. Weather related outages occur due to wind damage, lighting strikes and other storm related damage.

Given the duration and frequency of outages in the Peterborough and Nirranda South supply area are well above the averages experienced across our network, we are seeking to prevent any further deterioration in supply in this area.

B.6.2 Options analysis

We have considered a number of potential options to address the supply risk to the Peterborough and Nirranda South area from outages of the incoming HV feeders. In addition to the base case, credible options are those that are economically able to meet the identified need, meaning the solution is both technically and economically feasible. Only option four was considered credible to meet the identified need.

Option one: base case

This option assumes that there is no additional investment for improving network service levels for the Peterborough and Nirranda South area. Reliability outcomes for the Peterborough and Nirranda South area are expected to remain significantly worse than network averages.

Option two: install diesel generator microgrid

This option involves installing a diesel generator microgrid in either the Peterborough or Port Campbell townships to improve reliability. The generator will be located at a suitable area within the township and connected to the HV network.

In the event of an outage on the feeder, the automatic circuit recloser (ACR) upstream of the township will open and isolate the township from the main electrical grid. The diesel generator is able to be started within minutes to supply the township with electricity in the event of an outage.

This option was discounted due to the low density of customers and essential services in either the Peterborough or Port Campbell township. A microgrid is only able to cover a small geographic area as it relies on fault events not affecting the electrical assets within the microgrid boundary. This solution is ideal for townships where there is dense housing with minimal vegetation or areas which have many community facilities which would benefit the wider area in the event of a prolonged outage.

A microgrid solution is not appropriate as it would only benefit a small percentage of the customers in the Peterborough and Nirranda South Supply Area. Expanding the microgrid to encompass more customers would make it susceptible to the same outage events as the current feeders.

Due to this option not being considered credible for the identified need we have not estimated the capital cost of this option.

Option three: install diesel generator and BESS microgrid

This option is to procure and install a battery energy storage system (BESS) as well as a diesel powered generator in either the Peterborough or Port Campbell township. Both assets will be installed at a suitable area within the township and connected to the HV network.

The microgrid operates in two different modes. During an outage, the township is "islanded" from the electricity grid as the ACR upstream of the town opens. The microgrid would then provide an alternative supply source to customers primarily through the BESS in shorter outages. The diesel generator would be utilized in extend outages and when the demand in the township exceeds what the BESS can supply.

In the absence of a feeder outage, the BESS has the potential to operate in grid connected mode where it provides additional benefit streams through participating in energy markets, as well as storing excess solar exports of customers for use during non-generating hours.

This option was discounted for the same reasons as option two. Due to this option not being considered credible for the identified need we have not estimated the capital cost of this option.

Option four: HV tie line

This option would install a HV tie line between the TRG024 and WBL012 feeders to allow supply to continue to flow in the event one feeder suffers an outage.

The new tie will consist of 0.75km of new HV overhead line, upgrading of 8.6km of existing HV tie line and the installation of three automated switching devices.

The tie line will allow for customers in the Peterborough and Nirranda South areas to be supplied from an alternative HV feeder in the event of an outage. Automation switching equipment will be installed to facilitate the rapid restoration of customers via the alternative feeder.

The new feeder tie and automated switches will allow the automated restoration of the Peterborough and Nirranda South communities for faults on the TRG024 and WBL012 feeders and will significantly reduce the duration of an outage.

The capital cost of this option is $2.6m

Option five: undergrounding

This option would involve the installation of significant lengths of HV underground cable along the TRG024 and WBL012 feeders.

TRG024 feeder which supplies Peterborough town consists of over 207km of overhead HV line and WBL012 which supplies the Nirranda South area consists of over 212km of overhead HV line. The section TRG024 from Terang to Peterborough is approximately 50 km long and would need significant sections moved for undergrounding to have a material effect on the reliability and resilience of supply. A similarly large amount of undergrounding would be required for the section from Warrnambool to the Nirranda South area, which is approximately 40 km long. Undergrounding such a large segment of the feeder would have a substantial capital cost making this option uneconomic.

Undergrounding only small sections of feeder would not significantly improve the resilience and reliability of the feeder, as any faults on the remaining overhead sections of the lines will still be exposed to the same outage risk during extreme weather events.

Due to this option not being considered credible for the identified need we have not estimated the capital cost of this option.

B.6.3 Option evaluation

The credible options were evaluated using a cost benefit analysis. The cost benefit analysis compares the capital and operating expenditure of the options against the quantified benefits of undertaking each option.

The main quantified benefit relates to the reduction in the energy at risk for customers in the supply area. A reduction in energy at risk will lead to an increase in the reliability of supply for customers within the supply area. Energy at risk has been calculated using historical outage data specific to the Peterborough and Nirranda South supply area over the past five years.

Values of network resilience (VNR) and worst served customers have been considered in conjunction with the standard value of customer reliability (VCR) to quantify this benefit.[34] We have ensured that there is no overlap between our worst served customer value and the AER's VNR, prioritising the use of the VNR when applicable.

The benefit streams associated with BESS market participation have been included based on the estimated value of leasing the BESS to a retailer, given potential regulatory constraints around distribution networks operating in BESS related markets.

The analysis was undertaken over a 20-year time period to align with the expected life of the assets.

B.6.4 Results summary

Table 19 shows the results of the option evaluation against our base case. Option four is the preferred option, with further detail provided in our attached model.[35]

TABLE 19 OPTION EVALUATION RESULT ($M, 2026)

OPTION	PV COST	PV BENEFITS	NPV
Option four: install a HV tie line	1.3	3.8	2.5

Sensitivity analysis

Sensitivity analysis was also used to test the robustness of the central scenario results.

Sensitivities relating to capital expenditure total benefits have been undertaken. Capital expenditure sensitivities have been included to ensure that the options are robust to movements in both cost increases and decreases. Benefit sensitivities have been included to ensure that the options are robust to changes on energy at risk, the main quantified benefit in this business case.

Option four maintains a positive net present value under all sensitivity scenarios and remains the preferred option under all scenarios.

B.6.5 Preferred option

The preferred option—option four— is to install a new HV tie line between the TRG024 and WBL012 feeders. This involves the installation of 0.75km of new HV line, the upgrading of 8.6km of existing HV line and the installation of three new automated switching devices.

The route of the new HV feeder tie is proposed in figure 15.

The installation of this option would result in a reduction in unserved energy of 3.5 MWh for customers in the Peterborough and Nirranda South supply area.

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34 See section B.2.2 for further details on the values included in our resilience business cases

35 PAL MOD 3.27 – worst served customers TRG-WBL – Jan2025 – Public

FIGURE 15 PROPOSED TIE LINE

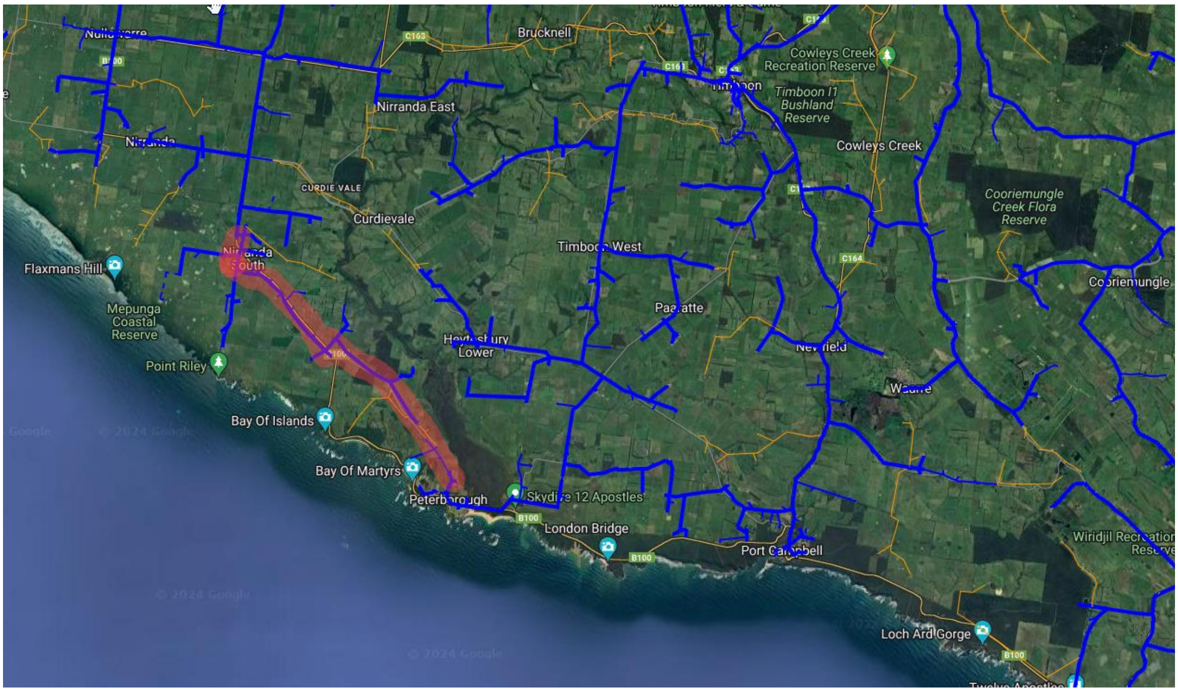


Table 20 outlines the proposed capital expenditure for the new tie line over the next regulatory period.

TABLE 20 INSTALLATION OF TIE LINE ($M, 2026)

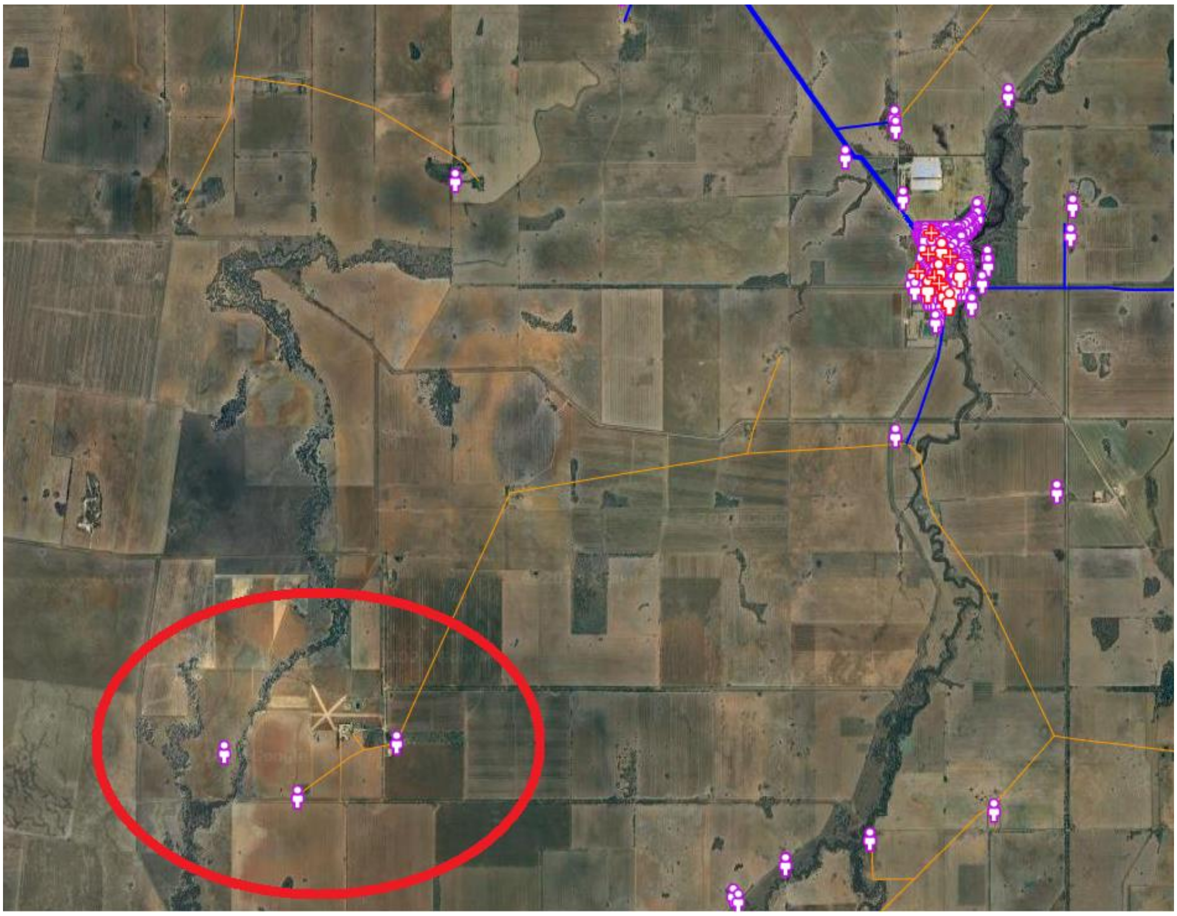
OPTION	FY27	FY28	FY29	FY30	FY31	TOTAL
Install a HV tie line	-	0.4	0.9	1.4	-	2.6

B.7 Stand alone power systems

We have extensive regional and rural network where the density of customers is low compared to the amount of overhead assets required to service them. The least dense areas are single wire earth return (SWER) network sections where approximately 21,000km of lines services around 28,000 customers.

The cost to service these customers is high compared to elsewhere on the network due to the long lengths of line and associated vegetation management needed to service a relatively small number of customers. These high costs result in overall higher electricity costs for customers in our network.

FIGURE 16 EXAMPLE OF SWER NETWORK



B.7.1 Identified need

SWER conductors are typically constructed out of galvanized steel which has high tensile strength so that spans can run for longer lengths between poles. This design allows these customers to be supplied with electricity at a lower cost, however, customers at the end of these lines are more likely to experience power quality issues due to the high impedance lines. These customers also suffer from more frequent and prolonged outages due to the susceptibility of long spans to extreme weather events as well as the time required for field crews to perform repairs in these remote locations.

SWER lines also represent a significant risk on our network as they are almost always located in hazardous bushfire risk areas (HBRA).

The identified need, therefore, is to prevent any further deterioration in supply for end of SWER line customers.

B.7.2 Options analysis

We have considered a number of potential options to address the reliability of supply for end of SWER line customers. In addition to the base case, credible options are those that we consider are economically able to meet the identified need, meaning the solution is both technically and economically feasible.

Option one: base case

This option assumes that there is no additional investment into improving the network reliability of customers at the end of SWER lines. Current SWER lines, with their associated maintenance costs are maintained.

Option two: install SAPS for customers at the end of SWER lines

This option is to retire overhead assets and install a stand alone power system (SAPS) for selected customers. These customers will typically be located in very remote areas at the end of long lines or those who experience a large amount of outage minutes every year.

The SAPS consists of an array of solar panels, a battery energy storage system and a backup diesel generator. The solar panels and battery are sized to supply the majority of the electricity consumed by the customer, however, a diesel generator is utilised during periods of peak load as well as when there is a lack of solar generation.

A SAPS allows a customer's electricity to be supplied from assets which are located on their property. These assets will be much less exposed compared to typical SWER networks where many kilometres of overhead lines run through heavily vegetated areas.

Option three: install microgrids in selected SWER areas

This option is to install a diesel generator microgrid to provide backup supply for end of SWER line customers. In the event SWER conductors are damaged upstream of the microgrid isolation point, the diesel generator is able to provide backup supply until the damage is repaired.

A microgrid is best suited to supplying back up supply to customers in a concentrated area, as any outage that occurs within the boundary of a microgrid will lead to an outage across all customers within the microgrid. The larger the microgrid area, the more susceptible it will be to outages, as the number of lines required to maintain supply also increases. If any of the overhead assets within the microgrid boundary are damaged, the customers will experience an outage just as if there was no microgrid.

Customers at the end of SWER lines are often located in remote areas that do not possess the necessary density of customer to support a microgrid. Installing a diesel generator microgrid (the cheapest available microgrid) for only a handful of customers would be unlikely to generate significantly better reliability than a SAPS, but the cost would be in the order of 10-20 times that of a SAPS. Given this large discrepancy in cost this option is deemed uneconomic.

Due to this option not being considered credible for the identified need we have not estimated the capital cost of this option.

Option four: undergrounding of SWER lines

This option would remove the overhead SWER lines and replace them with undergrounded lines that are less exposed to outages. However, extensive lengths of SWER lines would be required to be undergrounded to have a meaningful impact on the reliability of supply to customers. If only small amounts of line are undergrounded, any outage that occurs on the remaining overhead lines will continue to lead to a loss of supply. Typical costs of undergrounding SWER lines are in the region of $3–10 million per customer making this option uneconomic.

Due to this option not being considered credible for the identified need we have not estimated the capital cost of this option.

B.7.3 Option evaluation

The credible options were evaluated using a cost benefit analysis. The cost benefit analysis compares the capital and operating expenditure of the options against the quantified benefits of undertaking each option.

The benefits considered included:

- unserved energy avoided – the value associated with the energy at risk that is avoided by moving from a network connection to a SAPS with a lower expected total outage time per year
- network bushfire risk reduction– the annualised cost relating to the risk that network assets initiate a bushfire
- planned repex avoided – the annualised cost of replacing network assets at end-of-life
- non-network bushfire repex avoided– the annualised cost of replacing network assets damaged or destroyed by non-network-initiated bushfires
- maintenance costs avoided – the annual cost of maintaining network assets
- vegetation management costs avoided – the annual cost of performing required vegetation management around lines
- power generation – the value of energy supplied within regulated SAPS
- avoided line losses – the value of the avoided lost energy in the distribution network based on the customer consumption removed
- emissions costs avoided – the value, based on the value of emissions reduction (VER) published by the AER, of the avoided greenhouse gas emissions from moving from the generation mix in the wider region to the more renewable-heavy generation within the SAPS deployed.

Some of the key assumptions included in the modelling are:

- line retirements will occur two years after the installation of a SAPS. We have not retired the lines directly after installation to allow time for customers to build trust in the SAPS before removing connection to the grid
- an off-grid transition payment of $30,000 per customer
- the analysis was undertaken over a 20-year time period to align with the expected life of the assets.

Further information on the quantified benefits including the methodology for calculating each benefit is included in our methodology document and attached assessment model.[36]

Results summary

Table 21 shows the results of the option evaluation against our base case. Option two is the preferred solution.

[36] PAL ATT 3.07 – Blunomy – SAPS methodology – Jan 2025 – Public; and PAL MOD 3.28 – SAPS roll-out – Jan 2025 – Public

TABLE 21 OPTION EVALUATION RESULT ($M, 2026)

OPTION	PV COST	PV BENEFITS	NPV
Install SAPS	5.4	5.6	0.2

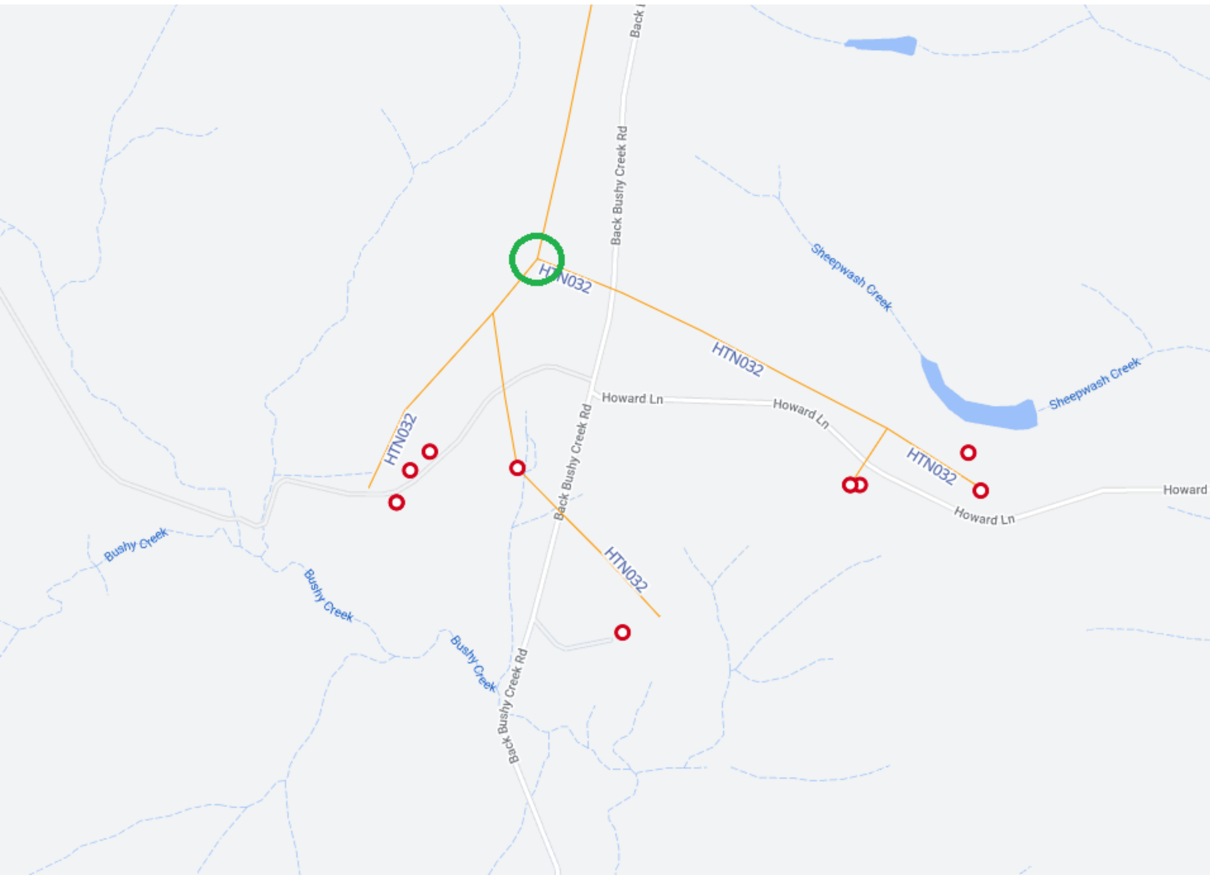
B.8 Preferred option

The preferred option—option two—is to install SAPS and retire overhead lines for selected customers on the SWER network.

As outlined previously, the selection criteria was based on a nodal analysis which considers the benefits and costs of installing SAPS and retiring overhead lines for all customers downstream of a ‘node’ in the SWER network. This methodology was chosen because many of the SAPS benefits are due to the retirement of lines which can only occur if all the customers downstream of a node are disconnected from the electricity grid.

Nodes which were selected typically had a combination of high bushfire risk, high vegetation management costs, long lengths of overhead lines supplying few customers and poor reliability.

FIGURE 17 EXAMPLE NODE (GREEN) AND CUSTOMERS DOWNSTREAM OF NODE



The nodal analysis, identified 44 nodes with 71 SAPS which were economically viable. However, since SAPS are a relatively new in Victoria, we are only proposing to install 17 SAPS in the next regulatory period. We expect to expand the SAPS portfolio in the following regulatory period once we have a demonstrated track record of integrating these into our systems to provide customers greater confidence on service level outcomes associated with this approach.

Below is a preliminary list of SAPS proposed for the 2026–31 regulatory period. Further detailed analysis including site visits and geotechnical studies will be performed before finalising the sites.

TABLE 22 SUMMARY OF SAPS FOR THE 2026–31 REGULATORY PERIOD

NODE	LOCATION	FEEDER	NUMBER OF SAPS	NUMBER OF OFF-GRID TRANSITION CUSTOMERS	NUMBER OF POLES RETIRED	LENGTH OF LINE RETIRED (KM)
1	Winnap	PLD003	1	1	26	11.4
2	Walpeul	OYN001	1	3	24	8.1
3	Merrinee	RCT023	2	4	46	7.3
4	Annuello	OYN003	1	1	15	12.3
5	Nowie	SHL001	3	3	59	3.4
6	Winnambool	OYN003	1	2	20	18.0
7	Carina	OYN001	7	0	136	4.4
8	Grass Flat	HSM004	1	1	14	31.6

Table 23 outlines the proposed capital expenditure for the preferred option over the next regulatory period.

TABLE 23 INSTALLATION OF SAPS ($M, 2026)

OPTION	FY27	FY28	FY29	FY30	FY31	TOTAL
Install SAPS	-	0.8	0.8	0.8	1.3	3.7

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