NETWORK AND COMMUNITY RESILIENCE

UE BUS 5.01 – PUBLIC

2026–31 REGULATORY PROPOSAL

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1. Overview

Resilience is the ability to withstand and recover from the effects of a natural hazard or disaster. It is about planning for, operating through and recovering from a major event. This can be through taking proactive measures to minimise outages due to major events or through a combination of proactive and reactive measures to minimise the time taken to recover when an outage does occur.

In contrast, reliability is about continuous supply of electricity. It generally focuses on average network performance and seeks to minimise outage time during normal conditions. It is typically measured by normalised outages per customer or normalised average outage duration per customer, excluding 'major events'.

The main distinction between resilience and reliability is that reliability excludes major outage events, while resilience focuses on these. When these major events occur, they are classified as major event days (MEDs) and represent days where the network experiences stresses beyond what is normally expected. This predominately occurs when the network is hit by extreme weather.

1.1 The impact from extreme weather events on our assets is likely to continue to grow

Extreme weather events that cause impacts at scale are now occurring in Victoria nearly every year.[1]

In total, over 681,000 sustained outages due to extreme weather have occurred in our network during the 2021-26 regulatory period.

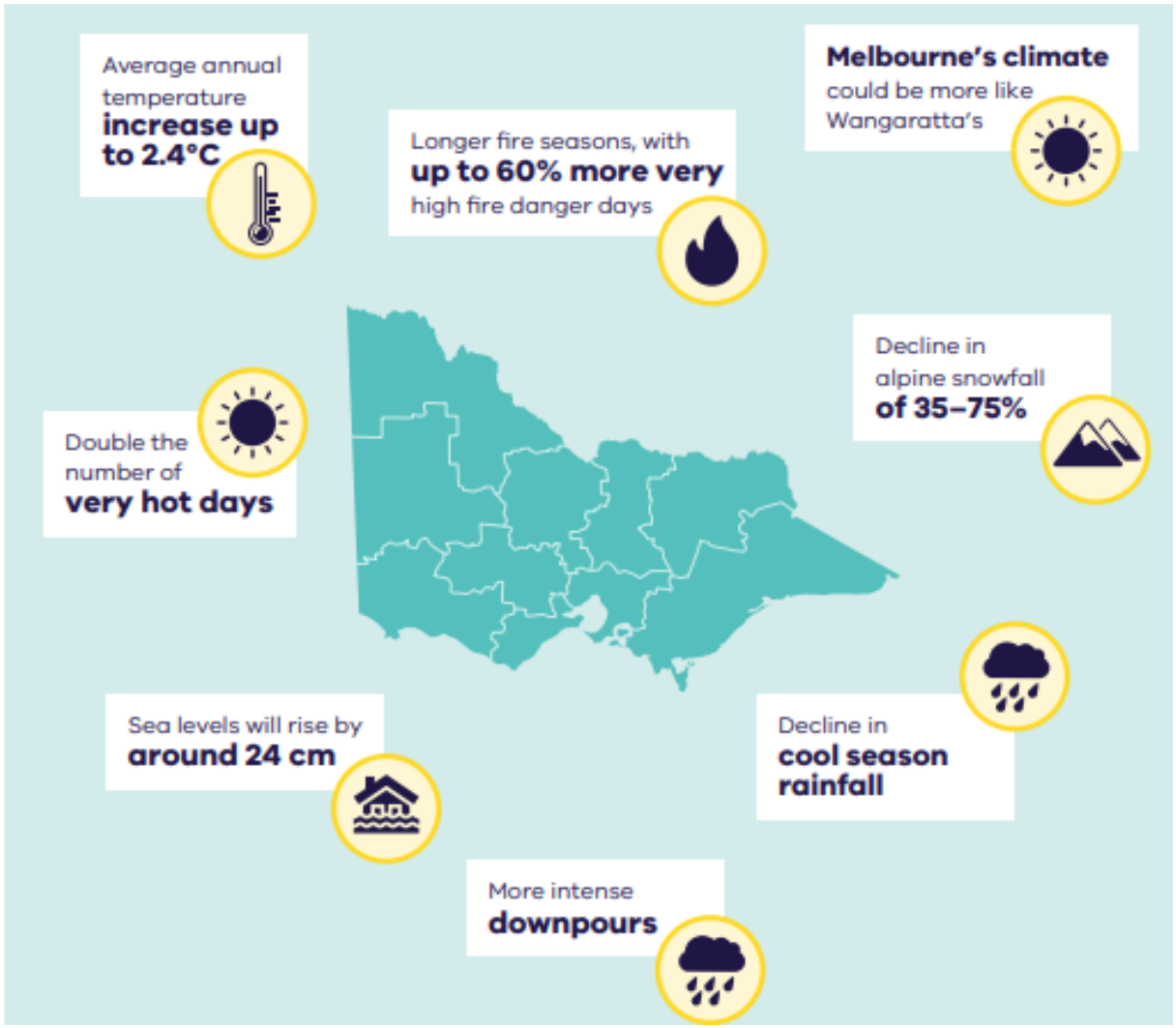
More recently, in February 2024, more than one million Victorian customers were off supply after a major storm front crossed Victoria. This storm was significant enough to damage transmission infrastructure, as well as distribution assets. The direct cost of this event on Victoria (excluding compensation payments) was estimated at $770 million.[2]

Consistent with climate modelling, it is widely accepted that these sorts of extreme weather events will become more frequent and more severe in the future. Modelling undertaken by the Department of Environmental, Land, Water and Planning in 2019 estimates that by 2050 under a high emissions scenario, Victoria will experience:[3]

- an average annual temperature increase up to 2.4 degrees higher
- up to 60 per cent more very high fire danger days
- double the number of very hot days
- an increase in the number of extreme rainfall events.

1 DEECA, Network Outage Review, Interim Report, 2024, p. 5
2 DEECA, Network Outage Review Interim Report, 2024, p. 17
3 DELWP, Climate Science for Victoria, 2019, p. 9

FIGURE 1 VICTORIAN CLIMATE IN 2050

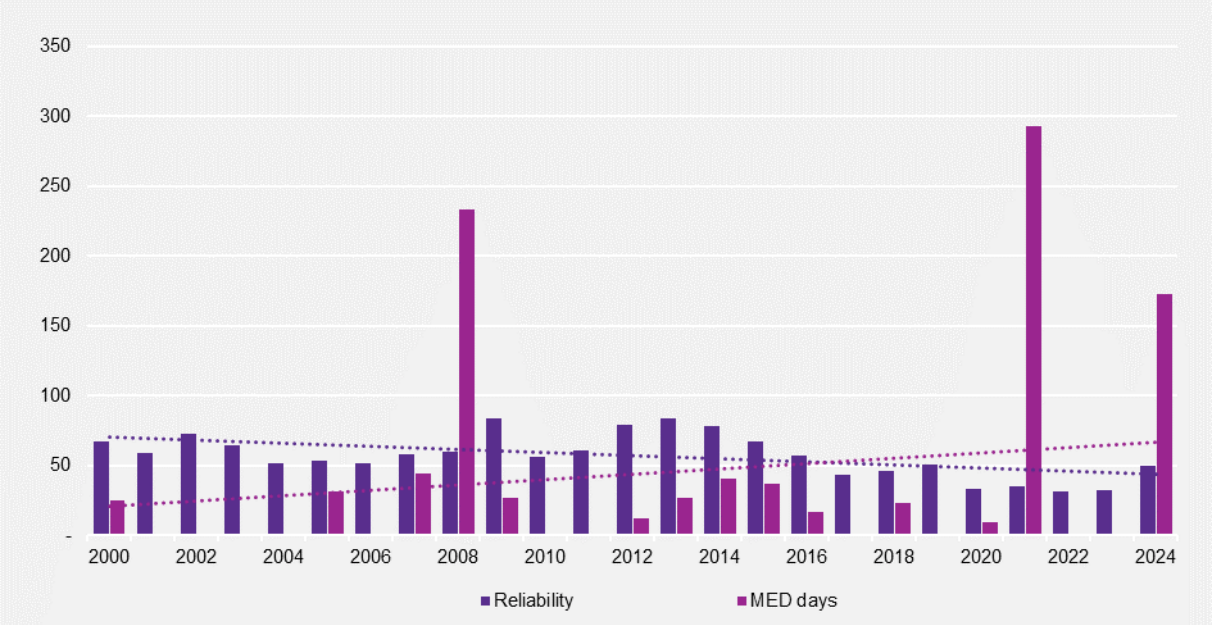


Source: Victoria's Climate Science Report 2019

The changing climate is already impacting our distribution network. As shown in figure 2, while general reliability has been improving over time, customer minutes off supply from MEDs have increased (including several significant spikes in recent years).

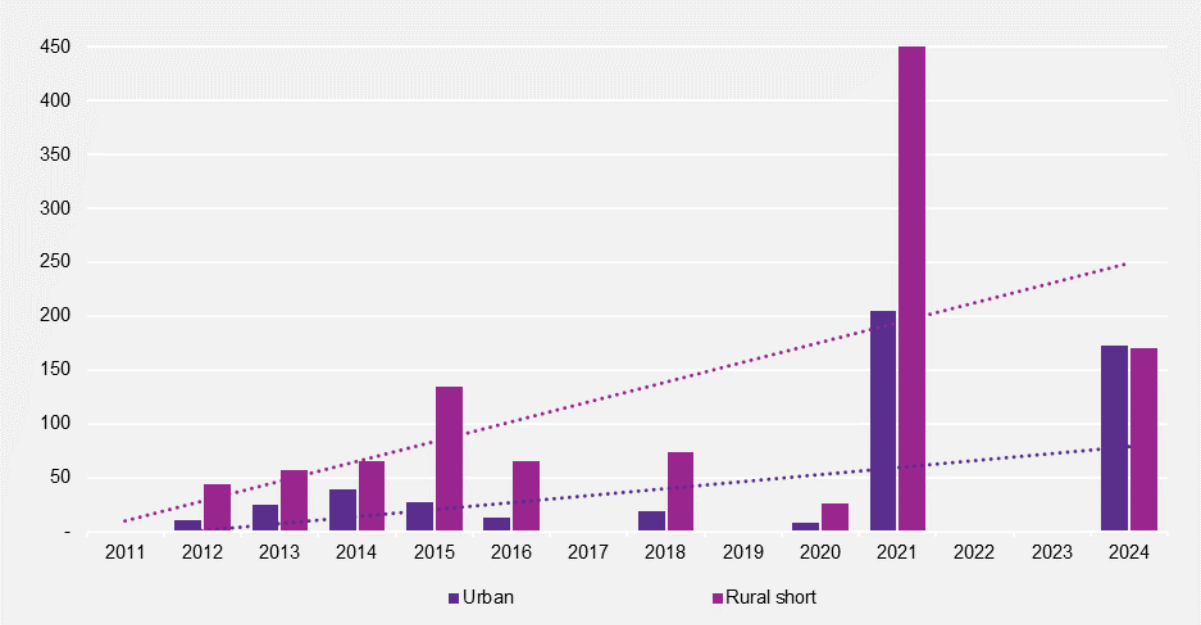
As the frequency and severity of these events has increased, so too has the impact to customer's supply. Without investment in our network to make it more resilient to extreme weather it is likely that customer service standards will continue to decline.

FIGURE 2 UNITED ENERGY CUSTOMER MINUTES OFF SUPPLY



The impact of these extreme weather events are falling disproportionality on our regional and rural customers. Figure 3 breaks down SAIDI attached to MED days for each of our feeder types; urban and rural short. While SAIDI associated with all feeders is increasing over time, SAIDI associated with our rural feeders is increasing significantly faster as a result of more frequent and severe weather events.

FIGURE 3 UNITED ENERGY CUSTOMER MINUTES OFF SUPPLY DURING MED DAYS



1.2 Customers are becoming more dependent on electricity than ever before

At the same time as our climate is changing, rapid electrification and changing behaviour preferences are increasing community dependence on a resilient electricity supply. This dependence is likely to accentuate the impact communities face when they experience a loss of supply—for example:

- critical infrastructure is increasingly reliant on electricity including water, sewerage, telecommunications and the internet
- increases in remote work, school and other commitments which were once in-person
- population movement from inner city to more regional areas, which are more prone to extreme weather and more reliant on community and individual preparedness
- increasing take up of hybrid and EVs means more people are reliant on electricity for their transportation needs
- as we move towards net-zero, electrification and the gas transition will increase and options for non-renewable services such as gas will decrease.

Figure 4 summarises some of these inter-relationships between electricity and other critical goods and services—namely, these goods and services are all dependent on electricity.

FIGURE 4 INTER-RELATIONSHIP BETWEEN ELECTRICITY AND OTHER CRITICAL GOODS AND SERVICES

This increasing dependency on electricity will mean that any future unplanned outages linked to extreme weather events are likely to have greater impacts on customers than historical outages. A greater impact of outages, coupled with a growing number of extreme weather events due to further changes in the climate, will result in larger risks to all communities.

1.3 The Victorian Government expects distribution businesses to improve network resilience

Following extreme storm events in 2021, the Victorian Government engaged an expert panel to undertake an Electricity Distribution Network Resilience Review.[4]

The expert panel consulted broadly with local communities and stakeholders impacted by the extreme storms. It found loss of power caused 'considerable distress' and devastating consequences on peoples lives.[5] 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.[6]

The outcomes from this review made clear the government's expectation that we reduce both the **likelihood** and **impact** of prolonged power outages by making investments in resilience. Specific recommendations included:

- distribution businesses should be required to take an all-hazards approach to risk mitigation for the purposes of safety, reliability, security and resilience of the electricity system. This should result in a regular assessment of the need for investments and solutions in the most high-risk locations, from 2025 onwards
- distribution businesses should be required to partner with communities and local councils in emergency planning and response
- distribution businesses should have new obligations to improve the prioritisation of the restoration of power following an outage, and improve their communication with customers before and after prolonged power outages.

Aa a result of the review, the Department of Energy, Environment and Climate Action (DEECA) has proposed a rule change to the AEMC to enshrine resilience objectives explicitly in the National Electricity Rules.[7] Within this proposed rule change DEECA has highlighted the increasing threat of major event days and the need for proactive resilience investments to reduce the overall costs to customers.[8]

This review has since been followed by a Network Outage Review into the February 2024 storm event.[9] The outage review highlighted that distribution businesses no longer operate in an environment which is 'steady state'; we are now operating with real potential for frequent weather events that cause impacts at scale. As a result, the Victorian government expects a change in distribution businesses preparedness, response, and recovery from these events to protect the power Victorians value and the ecosystem of essential services that electricity distribution networks sustain.[10]

The outage review concluded in August 2024 with expectations that distribution businesses robustly plan for major events, align restoration with the Victorian Preparedness Framework and proactively

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4 More information can be found at: https://www.energy.vic.gov.au/about-energy/legislation/regulatory-reviews/electricity-distribution-network-resilience-review
5 DEECA, Electricity Distribution Network Resilience Review, Final recommendations report, pp. 4–5
6 DEECA, Electricity Distribution Network Resilience Review, Final recommendations report, p. 9
7 DEECA, AEMC Rule Change Request submission, 30 July 2024
8 DEECA, AEMC Rule Change Request submission, 30 July 2024, p. 7
9 More information can be found at: https://www.energy.vic.gov.au/about-energy/safety/network-outage-review
10 DEECA, Network Outage Review, Final report, p. 14

address worst performing feeders to reduce the number and impact of outages.[11] It also highlighted the critical need for us to provide customers accurate and timely information and immediate local presence and support. The review emphasised the importance of alternative solutions on the ground, such as community hubs and alternative generation to support communities.[12]

The outage review also included a recommendation that distribution businesses annually attest to the currency, completeness, maturity and implementation ability of their emergency risk management practices.[13]

1.4 Our customers expect us to do more to prevent the impacts of extreme weather events

To better understand the lived experience of our customers through these extreme events, we engaged extensively with customers on network resilience. This involved community roundtables, joint engagement with our Victorian distributors on resilience investment principles, and targeted conversations with key stakeholders through our broader regulatory reset engagement program.

Through these engagements customers provided a number of insights that have helped guide our resilience investment approach:

- resilience is a vital element of energy systems, particularly in light of rising climate-related disruptions
- improving network resilience involves adapting to changing environmental and operating conditions
- customers believe that distributors play a critical role in proactive and reactive disaster management and need to develop network resilience plans tailored to community needs
- regional communities place value on support services such as MERVs that provide a point of both practical (temporary power supply) and psychological support (a gathering point for the community)
- transparent communication and education are critical, especially during emergencies, to stay informed about outage causes, recovery times and preparedness measures.

At our trade-off forums we presented customers with a variety of options to better understand customer's willingness to pay for network and community resilience. 79 per cent of all customers supported either an $18 million program (with residential bill impacts of $0.49 per annum) or a larger $31 million program (with residential bill impacts of $0.88 per annum) to support network resilience. Additionally, 68 per cent of all customers supported either a $1.2 million program (with residential bill impacts of $0.14 per annum) or a larger $2 million program (with residential bill impacts of $0.27 per annum) to support community resilience.

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11 More information can be found at: Victorian Preparedness Framework | Emergency Management Victoria; and DEECA, Network Outage Review, Final report, pp. 7-12

12 DEECA, Network Outage Review, Final report, pp. 26-27

13 DEECA, Network Outage Review, Final report, p. 12

2. Our proposed approach to resilience

Our proposed approach to meet government and community expectations for both network and community resilience is focused on how we can better prepare, adapt and respond to climate extremes. This approach represents a longer-term shift towards the proactive investment cycle required by the Victorian Government.

TABLE 1 OUR APPROACH TO RESILIENCE

	We **prepare** by hardening our network and working with communities to bolster their readiness.
	We **adapt** by taking a future-proofed, no-regrets approach to our business-as-usual operations and ensuring alternative supply arrangements.
	We **respond** by quickly mobilising when events occur to provide on the ground support to impacted communities.

2.1 We have used robust climate modelling to identify areas exposed to extreme weather

To understand how extreme weather events are likely to impact our network and communities over the next regulatory period (and beyond), we engaged AECOM to undertake a climate impact assessment. This assessment used existing independent literature, including the Victorian Government's Climate Science Report and the Electricity Sector Climate Information, to identify and map climate risks and hazards.[14]

AECOM's report highlighted that our network's area is particularly exposed to extreme rainfall, bushfires and wind.

As a second phase of work, we also engaged AECOM to develop a methodology to measure how these climate hazard will impact our network in the future. This included the variable that should be used to represent each climate hazard and how that variable should be projected forward using climate science.[15]

The majority of this modelling has focused on bushfire and flood as modelling related to these types of extreme events has a greater level of maturity. This also corresponds with customer feedback regarding the type of resilience events we should protect against.

Modelling around storm events, specifically around extreme wind gusts which can damage our network assets, continues to prove to be challenging, and we consider that at this stage there is still more work required before wind modelling can be used with the level of certainty required to justify large levels of resilience investment. We will further our wind modelling capabilities during the 2026–

14 More information can be found at:https://www.climatechange.vic.gov.au/victorias-changing-climate
15 See: UE ATT 5.01 - AECOM - Methodology report - Jan2025 - Public.

31 regulatory period to better understand how our network will be impacted by wind. Expenditure related to improving our climate modelling has been included as part of our innovation allowance.[16]

2.1.1 We have taken a conservative approach to our climate forecasts

We have used a moderate climate forecast scenario and timeframe to ensure customers pay no more than they should for safe and resilient electricity supply.

The Intergovernmental Panel on Climate Change (IPCC) has outlined four climate scenarios to explore potential future concentrations of greenhouse gases in the atmosphere, referred to as representative concentration pathways (RCPs). These range from high concentrations (RCP 8.5) to very low concentrations (RCP 2.6)—namely RCP 8.5, RCP 6.0, RCP 4.5 and RCP 2.6. Each RCP reflects a different concentration of global greenhouse gas emissions, based on assumptions of combinations of possible future economic, technological, demographic, policy, and institutional trajectories.

The use of RCP 8.5 allows for the identification of hotspots that may be exposed to more significant climate risks. It is also important to consider RCP 8.5, particularly for near-term climate projections as using a lower emissions scenario (e.g. RCP 4.5) assumes a level of mitigation over the last 15 years that did not occur.

While some of the literature suggests that we are tracking more closely to RCP 4.5, RCP 6.0 is also plausible as emissions would need to peak in 2040 and then decline reasonably rapidly to stay in line with RCP 4.5. However, downscaled Victorian climate projections are not available for RCP 6.0.

RCP 2.6 was not selected as it requires emissions to peak in 2020 and decline through to 2100 which is considered highly unlikely.

It is generally recommended in the literature, including by the Electricity Sector Climate Information (ESCI) Project and the Victorian Climate Projections 2019 (VCP19) guidance that both RCP 8.5 and RCP 4.5 be used to identify the exposure of assets to climate change.

However, as a conservative assumption we have used the emission scenario RCP 4.5 in modelling. We consider this is the least regrets path because:

- RCP 4.5 is a conservative emission scenario
- the use of RCP 4.5 is aligned with the AER's previous decisions for NSW distribution businesses

Climate forecasts are provided for the years 2050 and 2070. As we evaluate our investment initiatives over a 20-year assessment window, all investments for our 2026–31 regulatory proposal will be assessed up to 2050–51. Hence, we have used the 2050 climate forecast in assessing our resilience investments as it is within the 20-year assessment window.

We consider this is again a conservative approach that may underestimate the impact of climate change for some of our longer life assets. However, we consider using the 2050 forecasts instead of the longer term 2070 forecasts is prudent, as the 2070 forecasts inherently contain greater uncertainty due to their long-term nature.

[16] UE BUS 10.01 - Innovation allowance - Jan2025 - Public

2.1.2 We have focused our investments on weather events most likely to impact our network

Table 2 sets out the weather events that we have assessed for our 2026–31 regulatory proposal. We will continue to review climate change and assess its impacts to inform our future regulatory proposals.

TABLE 2 SELECTED WEATHER EVENTS

WEATHER EVENT	SELECTED	REASONS
Bushfire	✓	We have undertaken network analysis considering these weather events for our 2026–31 regulatory proposal. Given our network's geographical location (with extensive coastline) and being a highly urbanised network (approximately 90% urban) we have focused on the weather event that is most likely to cause outages on our network, storms with high winds. However, due to the challenges of robustly modelling wind data we consider it prudent to first enhance our wind modelling capabilities in the 2026–31 regulatory period before undertaking significant investments that rely heavily on this data.
Flood	✓	
Storm with high wind	✓	
Heatwave	×	While heatwaves are a probable future weather event that impacts communities and our assets, its impact is less sudden and destructive because heat needs to build up over days before it has a material impact. Due to this gradual nature, we currently consider the most prudent and efficient way to prepare for future heatwaves is though incremental adaptation of network assets and processes.
Drought	×	We have not considered drought, earthquakes, tsunami, coastal erosion from sea level rise or storm surge, geomagnetic storms from solar flares and lightning storms in our 2026–31 regulatory proposal assessments because these weather events are significantly harder to predict.
Earthquakes	×	
Tsunami, coastal erosion from sea level rise or storm surge	×	
Geomagnetic storms from solar flares	×	
Lightning storms	×	

2.2 Our resilience investments reflect values for network resilience

In assessing potential resilience investments we have included the Australian Energy Regulator's (AER's) recently released 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

3. Our proposed resilience expenditure

Our proposed resilience investments are summarised in figure 5. These investments have been driven by the outcomes from recent Victorian Government reviews, and strongly supported by stakeholder and customer feedback.

We have split our resilience investments into two main categories; network hardening and community support.

Our proposed network hardening investment is focused on making network assets more resilient. More resilient network assets and supply routes will reduce the impact of extreme weather events on customer supply. Customers were very supportive of hardening our network assets during our customer engagement sessions but wanted us to make sure we were investing in the highest risk areas.

Our community support investments are focused less on our network assets and more on ensuring communities are able to plan for and quickly recover from the impacts of extreme weather events. These investments focus both on ensuring communities are prepared prior to extreme weather events, by having the necessary emergency planning in place, and that communities are supported to recover when these events do occur. The need for increased community investment was a clear outcome of the Victorian Government's 2021 and 2024 outage reviews, which recounted many of the lived experiences of communities during significant storm events.

FIGURE 5 OUR PROPOSED RESILIENCE INVESTMENTS

Our customers are experiencing the increasing risks and impacts of prolonged outages

In response to the increasing frequency and severity of extreme weather events, and our customers growing dependency on a reliable supply of electricity, we are proposing to harden the network and better support communities

		Prepare	Adapt	Respond
Network hardening	**New zone-substation at Shoreham** to improve resilience for customers on the lower-Mornington Peninsula	✓	✓	
	Enhanced climate modelling to better forecast consequence and causality of extreme weather events	✓	✓	
Community support	**Additional mobile emergency response vehicles** to cater for multiple, concurrent outages			✓
	Community Support Officers, who know and serve their communities	✓		✓
	Improved prioritisation tool to manage risk and provide more relevant information during extreme events	✓		✓

Creating more resilient communities and networks by:

Strengthening and adapting our network to avoid time off supply

Reducing the impact of extreme weather events

Increasing on-the-ground support with people that know the local community

The remainder of this document sets out the business cases that make up our proposed resilience investments. These business cases should be read with consideration of the material included in the initial sections of this document.

Table 3 provides a summary of our investments including the identified need and associated costs.

TABLE 3 SUMMARY OF RESILIENCE INVESTMENTS

PROGRAM	IDENTIFIED NEED	CAPEX	OPEX
Shoreham zone substation	Maintain service levels in the Lower-Mornington Peninsula supply area as the severity and frequency of extreme weather events increase	25.0	-
Enhanced climate modelling	Better forecast how storms are likely to impact our network as the climate changes	*0.5* [17]	-
Community support	Provide additional community support in preparing for and recovering from extreme weather events	0.3	1.5
IT situational awareness	Improving the prioritisation and visualisation of outages during large scale outage events	3.1	2.7
Total		**28.4**	**4.2**

3.1 Evaluated credible options using cost-benefit assessment

We undertook the following steps to identify and assess options for our proposed resilience projects and programs:

- identified areas of our network that are exposed to risks associated with the increasing frequency and severity of climate extremes
- short-listed technically and commercially credible solutions to address the identified need
- undertook cost-benefit analysis to identify the preferred solution (relative to our base case).

For options that we considered were both technically and commercially credible, we evaluated the economic efficiency based on a quantitative cost-benefit assessment. This assessment compared the cost of credible options against the risks and impacts of the extreme weather event(s) on our assets and the community.

The credible option that yielded the highest positive net present value (NPV) of costs and risks/benefits to the community formed the preferred option for the resilience program. This ensured we invested in projects that provided the highest benefit to the community and ensured that the cost of the program exceeded the total risk value.

This cost and risk/benefit assessment was underpinned by the risk monetisation approach shown in figure 6. This approach is consistent with the AER's industry practice planning note for asset replacement planning.

[17] Enhanced climate modelling expenditure is included in our innovation allowance, see UE BUS 10.01 - Innovation allowance - Jan2025 - Public

FIGURE 6 RISK MONETISATION ANALYSIS

We consider this process, in conjunction with our customer engagement, aligns with the requirements outlined by the AER in its network resilience note on key issues.[18] The AER consider evidence to support ex-ante resilience funding should demonstrate that:

- there is a causal relationship between the proposed resilience expenditure and the expected increase in the extreme weather events
- the proposed expenditure is required to maintain service levels and is based on the option that likely achieves the greatest net benefit of the feasible options considered
- consumers have been fully informed of different resilience expenditure options, including the implications stemming from these options, and that they are supportive of the proposed expenditure.[19]

[18] AER, Network resilience – A note on key issues, April 2022
[19] AER, Network resilience – A note on key issues, April 2022, pp. 11-14

A

SHOREHAM ZONE SUBSTATION

A Shoreham zone substation

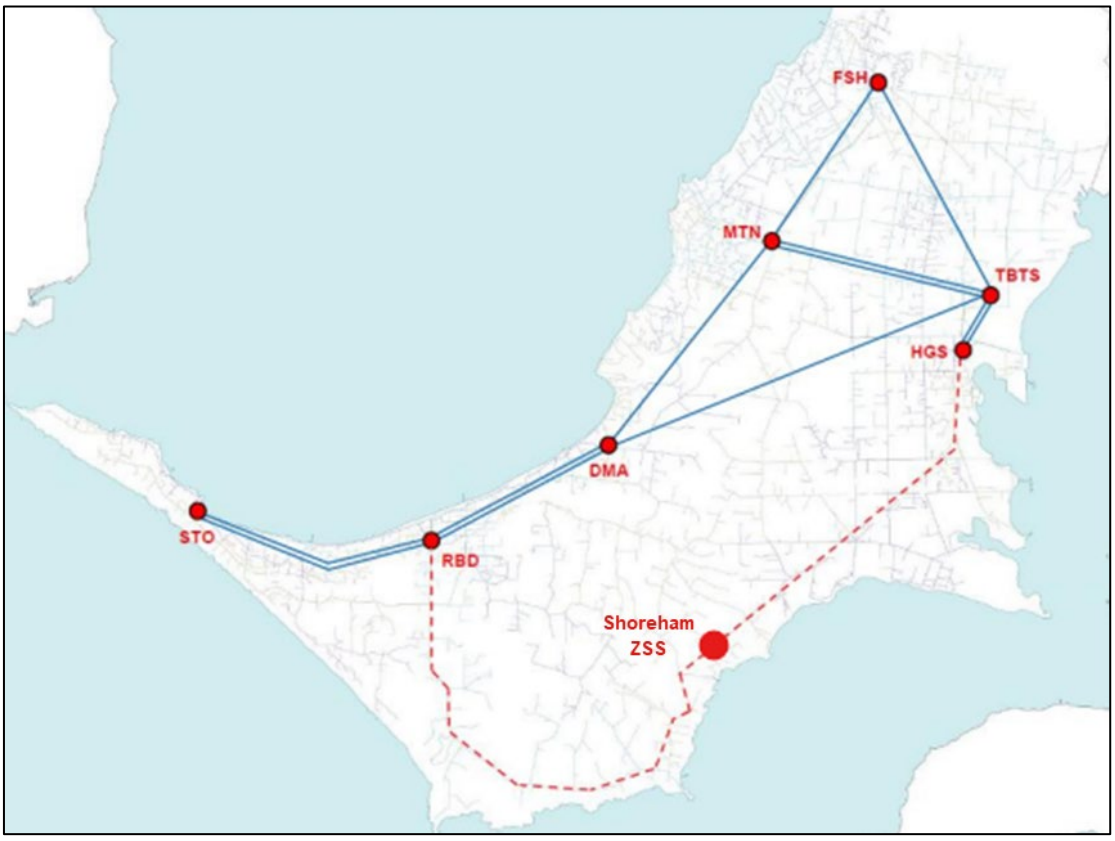
The lower-Mornington peninsula (LMP) is supplied by three zone substations — Dromana (DMA), Rosebud (RBD) and Sorrento (STO). DMA is supplied by two 66kV sub-transmission lines from Tyabb Terminal Station (TBTS) and Mornington (MTN) zone substation. DMA supplies RBD and STO zone substations. It covers approximately 720 square kilometres of land with a coastline that extends over 190km and encompasses approximately 10% of Victoria's coastline. The LMP supply area is set out in figure 7.

As part of our 2026–31 regulatory proposal we are proposing to construct a 66kV sub-transmission line from RBD to Hastings (HGS). This sub-transmission line is being constructed due to growth in residential electricity demand on the lower Mornington Peninsula. The number of permanent residents is increasing as holiday homes are being converted into permanent dwellings, residential developments and retirement villages. However, maintaining security of supply during peak holiday periods is the main driver for this investment, with holiday loads close to double the load of standard summer peaks.[20]

In addition to the sub-transmission line we have also considered the inclusion of a new zone substation at Shoreham. Traditionally areas on the south-west side of the LMP supply area (such as Shoreham, Flinders and Cape Schanck) have been supplied by short rural feeders extending from zone sub-stations located on the north west (or bay-side) of the peninsula. These feeders often traverse heavily vegetated areas that can be difficult to restore when outages occur following extreme weather events, leading to extended outage events.

[20] See UE BUS 3.04 – Lower Mornington Peninsula supply area – Jan2025 – Public for further details

FIGURE 7 LOWER-MORNINGTON PENINSULA SUPPLY AREA



A.1 Identified need

The south-west of the LMP supply area is among the least resilient supply areas across our network. The terrain that our feeders traverse to service customers in this region is often heavily vegetated and at greater risk of outage during extreme weather events. The terrain can also make it difficult to restore supply following an extreme weather event, as access is often blocked, leading to extended outages for customers.

This is evident in our MED day outages data (see figure 3) where our customers served by short rural feeders (which are predominately located in the LMP supply area) experience significantly longer outages than customers in urban sections of our network. As the frequency and severity of extreme weather events continue to increase these customers will experience a continued deterioration in service standards.

Changing Victorian Government and customer expectations around resilience (see sections 1.2 and 1.3) also provides a driver for us to ensure the less resilient sections of our network do not continue to have deteriorating service levels.

The identified need is therefore to maintain service levels in the LMP supply area as the frequency and severity of extreme weather increases.

A.2 Options analysis

Analysis of options to maintain service levels in the LMP supply area is undertaken in our broader Hastings to Rosebud 66kV sub-transmission line business case.[21] This business case encompasses maintaining service levels for customers on the south-west side of the LMP supply area as well as the need to meet forecast demand growth and security of supply issues across the greater LMP supply area.

Options considered included:

1. **Maintaining status quo** – This option would utitlise currently available operational responses such as limited load transfers and the 10MW demand management program to meet demand. The demand management program includes the hiring and dispatching of diesel generators, batteries and arranging voluntary demand reductions.
2. **Construct 66kV sub-transmission line** – This option would construct a sub-transmission line from Hastings to Rosebud. It would include approximately 54km of new 66kV line, including a combination of overhead and underground works.
3. **Construct 66kV sub-transmission line and new Shoreham zone substation** - This option includes the construction of the new 66kV sub transmission line in the LMP area as detailed in option two and includes construction of a new zone substation in Shoreham.
4. **Non-network solution** – Under this option we would continue to publish information on this constraint and project in our Distribution Annual Planning Report (DAPR) and follow our Demand Side Engagement strategy to ensure that non-network providers are given the opportunity to propose economic solutions that technically and economically viable.

The preferred option from this business case is option three, to construction the new sub-transmission line and a new Shoreham zone substation. This option produced the highest economic benefit. For further details, including cost benefit analysis associated with each of the options, see the LMP supply area business case. [22]

In addition to the options included in the associated business case, we also consider targeted undergrounding in select regions of the LMP supply area, such as in and around Red Hill. While targeted undergrounding was economically viable in some areas, it was only likely to impact a small number of customers. We consider the preferred option of building a zone substation at Shoreham is able to provide resilience to a greater number of customers in the LMP supply area.

A.3 Preferred option

The preferred option is to construct a 66kV sub-transmission line between Hastings and Rosebud and a new Shoreham zone substation. The remainder of this section focuses on the Shoreham zone substation, which addresses the identified need to maintain service levels for customers in the LMP supply area. While this asset is included in the associated augmentation business case, the expenditure related to the zone substation has been included as part of our proposed resilience expenditure.

The construction of a zone substation on the south-west side of the LMP supply area will allow for significant shortening of some of our longest and least resilient feeders. Rather than relying solely on feeders stretching across the peninsula we will be able to construct feeders connected to the new

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[21] See UE BUS 3.04 – Lower Mornington Peninsula supply area – Jan2025 – Public for further details
[22] UE BUS 3.04 – Lower Mornington Peninsula supply area – Jan2025 – Public

Shoreham zone substation. Currently when a fault occurs on the feeder, all customers downstream of the fault will experience an outage. As the feeders stretch across the peninsula, a fault close to the zone sub station has the potential to cause outages for the majority of customers on that feeder. The terrain over which some of these feeders extend is often difficult to access, when a fault occurs in these regions it can lead to extended outages as our crews work to locate and rectify the fault. With the construction of a new substation and shorter feeders, in the event of extreme weather, less customers are likely to be impacted when a fault occurs.

The construction of the Shoreham zone substation will allow for four of our top ten longest feeders on our network to be shortened by almost 50 percent, including both our longest (MTN32) and second longest feeders (RBD21). These four feeders currently supply approximately 8,000 customers in the LMP supply area. Shortening these feeders will ensure we are able to maintain service levels for these customers as extreme weather events continue to include in frequency and severity.

Expenditure associated with the construction of the Shoreham zone substation is set out in table 4.

TABLE 4 SHOREHAM ZONE SUBSTATION CAPEX ($M, 2026)

	FY27	FY28	FY29	FY30	FY31	TOTAL
Shoreham ZSS	-	-	-	12.5	12.5	25.0

B

COMMUNITY SUPPORT

B Community support

When they occur, extreme climate events have widespread impacts across our communities. Historically, our primary focus during these outages has been to restore supply quickly and safely to as many customers as possible.

We are proud of our track record in responding to these events, which in the major storms in February 2024 for example, included a whole-of-business effort to restore supply to 90 per cent of customers within 19 hours. These restoration efforts are underpinned by significant preparation efforts, including scheduling additional crews and support staff (ahead of predicted weather patterns) to ensure we are ready to respond to multiple outages. As these events progress, our established escalation processes respond to safety issues and restoration priorities.

Our experience during these and other more recent events, however, is that our customers and communities are also seeking a local presence to support them on-the-ground—before, during and after events—to share information and help them make more informed decisions. Today, we are only able to provide this localised support on an ad-hoc and as-available basis (which we discuss in more detail in our options analysis section below).

B.1 Identified need

The identified need is to establish and/or strengthen ongoing partnerships with our communities to provide support before, during and after extreme events. This need is consistent with community expectations outlined during our stakeholder engagement program, as well the clear direction from the Victorian Government's resilience reviews.

B.1.1 Community expectations

Our understanding of the expectations of our customers as to how we can best support them to improve the resilience of their communities to extreme weather has grown through our shared experiences since 2021. Over the three-year period since major storm events in 2021, a recurring theme for communities across our network has been the strong desire for resilience planning through on-the-ground engagement by a permanent local presence.

Planning for extreme weather

Our customers believe their distributor must play a critical, proactive role in disaster management through planning for climate-related extremes:

> *"There is a role to play at the local level with communities"*
>
> *Community Workshop Participant*

We were told that a permanent presence with deep local knowledge is seen as foundational to a balanced approach to improving community resilience (i.e. combining infrastructure improvements with community-focused initiatives).

> *"(a permanent presence) can help educate the community, help with community engagement, and share things that do and don't work"*
>
> *Community Workshop Participant*

There was also strong consensus from participants on the importance of embedding representation from our network in strategic planning processes for local government and councils to ensure the needs of each individual community are met.

"(customers value) having a professional with the ability to communicate with senior stakeholders; SES, CFA and the Victorian Police (during municipal planning meetings)"

Community Workshop Participant

Supporting communities during extreme weather

During extreme weather events, our stakeholders expect us to provide accurate and timely information, countering the confusion and misinformation that often arises during emergencies.[23] Stakeholders emphasised the importance placed on a permanent presence having local knowledge of the community, understanding the location's vulnerable community members, and supporting a coordinated response during a crisis

Today, our presence in communities during extreme weather events is currently supported by two mobile emergency response vehicles (MERVs), which are split over the Powercor and United Energy networks. These vehicles were introduced following extreme weather events across our network in 2021 and 2022.

On-the-ground feedback during extreme weather events highlighted the preference for MERVs to maintain a permanent presence throughout extreme weather. Stakeholders supported the use of MERVs during emergencies for communication and support, with recommendations for this role to include community education and strategy deployment during major weather events.

Mobile emergency response vehicles

MERVs provide operational and psychological support during major weather events. They are a recognition of feedback we have heard from our communities—we cannot be everywhere, but we can be present where our presence is needed the most. The capability of our MERVs include the following:

68-inch TV monitor with remote access capability to our IT and spatial systems, allowing us to display critical safety messages and outage information

multiple communication platform connectivity including satellite phone, UHF and TMR radio functionality to provide feedback and insights to our EMT in our control rooms

portable PA system to support community briefings and town hall sessions

5-metre light mast to safely illuminate community hub areas and a retractable wrap-around awning for all weather cover

multiple phone charging lockers to support people recharge their devices including, iPads and laptop computers, safely and securely

mobile satellite WiFi connectivity to provide a local area hotspot for customers to access basic internet services such as banking, emergency services and social media networks

in-built fresh and grey water tanks for hot water, coffee machine, and drinks fridge to provide refreshments for affected community members

defibrillator, first aid kit and fire extinguisher

[23] For the avoidance of doubt, this is beyond, for example, the safe and timely restoration of supply.

fully integrated 7.5kVA onboard generator, providing 240 volts to power features of the vehicle and provide external power support to community hubs if required

550 watts of fixed rooftop solar, supported by a 300 Amp-hour deep cycle lithium battery.

B.1.2 Government recommendations

As outlined earlier in this document, following extreme storm events in 2021, the Victorian Government engaged an expert panel to undertake an Electricity Distribution Network Resilience Review. The Government's response to this review made clear its expectations, including the requirement that we partner with communities and local councils in emergency planning and response, and that we communicate with customers before and during prolonged power outages.

Recommendation four: partnering with communities and local councils in emergency planning and response

Current emergency planning arrangements do not explicitly outline that involvement with communities in emergency planning and management at both the municipal and regional level is a responsibility for electricity distribution businesses. In response, the expert panel recommended that electricity distribution businesses have more responsibility to engage with communities and local councils.

This recommendation also included the need for distributors to be available to attend relief centres, community hubs or a community meetings to provide information about incident and response activities.

The Government supported this recommendation in full to require electricity distribution businesses to partner with communities in emergency planning, response, and recovery.

Recommendation six: communication with customers before and during prolonged power outages

The expert panel found that additional information requirements and improved communication channels between electricity distributors, communities and local councils helps to empower affected communities to make informed decisions regarding their safety during a prolonged power outage. Further, the panel noted that a lack of communication access during an outage can be partly addressed by preparing customers at high-risk locations, with this being particularly important in rural communities where door-to-door knocking is not feasible owing to the sparsely distributed customer population.

While recognising the roles of multiple parties in effective communication, the Government accepted this recommendation in full.

This review was followed by a Network Outage Review into the February 2024 storm event. In response, the Victorian government expects that we change our preparedness, response, and recovery from these events to protect the power Victorians value and the ecosystem of essential services that electricity distribution networks sustain.

Recommendation two: distribution businesses annually attest to the currency, completeness, maturity and implementation ability of their emergency risk management practices

To support better outcomes for Victorian customers from prolonged power outages, it is important for Victorian distributors to proactively improve emergency management planning arrangements.

This includes the application of best practice communication and engagement approaches before, during and after prolonged power outages (including the ability to provide on-the-ground support to communities during emergencies and information on temporary generation for key community assets to regional and municipal planning committees).

Recommendation ten: owners and operators of critical infrastructure should participate in regional planning committees

The Victorian Government acknowledges the important role critical infrastructure providers can play in the planning and delivery of relief activities, ensuring that appropriate support is being provided to customers experiencing prolonged power outages, and appropriate consequence management processes are in place.

Appropriate representation of critical infrastructure providers and sector leads at Regional Emergency Management Planning Committees would support better preparation for power outages and could include testing of planning arrangements through exercises. It is important that this representation is flexible to the needs of different regional and municipal planning committees, and the nature of different critical infrastructure sectors. Importantly, this builds on the recommendation supported by the Victorian Government in the earlier resilience review for electricity distribution businesses to partner with communities in emergency planning, response, and recovery.

Collectively, these reviews make clear that there are new expectations for how distribution businesses support community resilience.

B.2 Options analysis

In response to stakeholder and government expectations, we have considered three options to establish and/or strengthen ongoing partnerships with our communities to provide support before, during and after extreme events. These options are summarised below.

We have undertaken a qualitative assessment of these options, recognising the value associated with supporting localised planning and ongoing support for communities before, during and after extreme weather is challenging to quantify. On this basis, we have given weight to the strong recommendations of the Victorian Government (noting these were themselves informed by a comprehensive, independent and public engagement process) and the consistent and corroborating feedback from our own customers and stakeholders.

TABLE 5 SUMMARY OF OPTION COSTS ($M, 2026)

OPTION		CAPEX	OPEX
1	Base case: maintain existing response support capabilities	-	-
2	Engage two community support officers and one additional MERV	0.3	1.5
3	Engage three community support officers and one additional MERV	0.3	2.3

B.2.1 Base case: maintain existing response support capabilities

Our base case scenario involves the continuation of our current approach to engaging communities, whereby we maintain a presence in regional cities or towns experiencing extreme weather events only

when an event occurs. Outside of extreme weather events, our physical presence within communities across our network will be limited to a targeted, temporary presence in response to an identified priority.

This business-as-usual approach is unlikely to meet the expectations of communities or allow us to deliver on the recommendations from the Victorian Government. For example, our ability to support emergency management and resilience planning is currently focused at a state-wide level only. Our network, however, spans 715,000 customers and 13,495 kilometres of powerlines and cables, and within these areas are different customer and community groups. The need for localised knowledge and presence means that our centralised and as-available approach would not be effective in meeting the expectations of our customers and the recommendations from the Victorian Government.

Similarly, our MERVs would continue to be allocated according to priority status across both Powercor and United Energy's network. For example, during the 2022 bushfires, we had to turn down requests for a MERV presence within our network due to existing fleet being allocated to priorities across Powercor's network.

As noted previously, customers have affirmed to us that they support a permanent MERV presence during major weather events.

As the frequency and severity of extreme weather increases, and our dependence on electricity grows, the limitations of our existing capabilities will be tested further.

B.2.2 Option two: two community support officers and one additional MERV

Research in best-practice community resilience building has established the importance of maintaining a sustained presence with deep understanding of local communities as a crucial first step to community-led resilience to natural hazards.[24] Community involvement in planning develops a plans efficacy, disaster response skillsets within the community, and increases risk perception.[25]

Under option two, we would employ two community support officers (CSOs) across our network. Additionally, we would procure a United Energy MERV, which means our network will always have the opportunity to maintain a presence during major event days.

Community support officers

Customer support officers (CSOs) will have year-round, full-time responsibilities in both business-as-usual time periods and during major weather events.

In its response to the first network resilience review in 2021, the Victorian Government set an expectation that distributors work with communities to develop and execute resilience plans. Development and delivering on resilience plans will be the primary responsibility of each CSO. Consistent with identified best practice and Government expectations, as part of establishing the plan, the CSO will:

- participate in regional and municipal planning committees to support response planning
- coordinate with other utility service providers to understand their vulnerabilities, particularly essential/critical services

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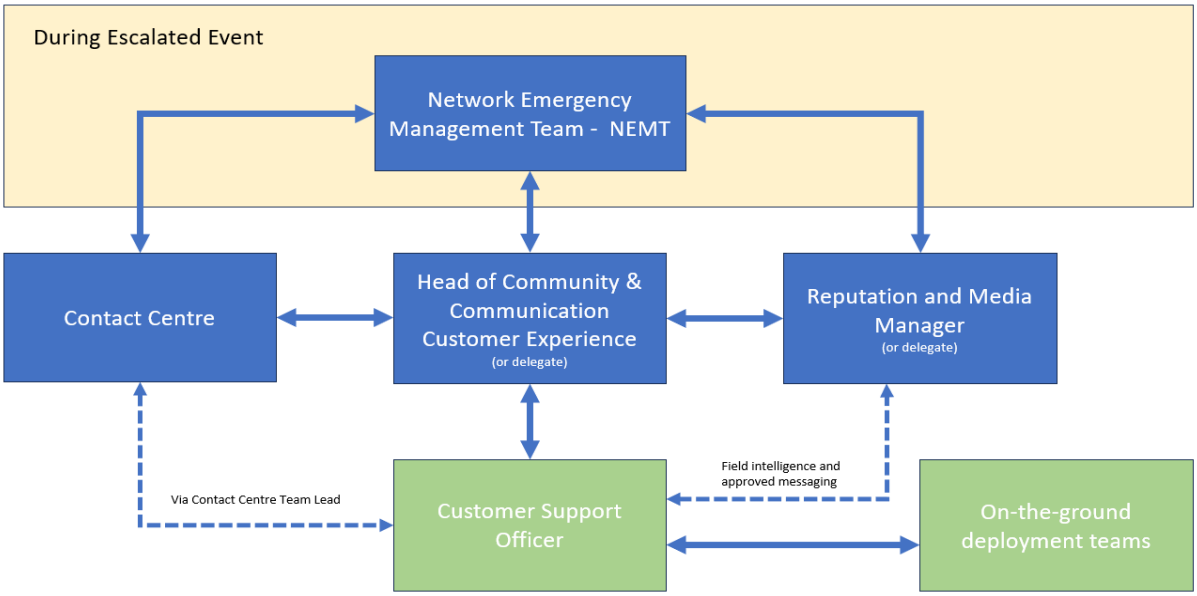
[24] Johnston, K.A., Taylor, M. & Ryan, B. Engaging communities to prepare for natural hazards: a conceptual model. *Nat Hazards* 112, 2831–2851 (2022). https://doi.org/10.1007/s11069-022-05290-2

[25] Karanci, A.N., Ikizer, G., Doğulu, C. (2024). Community Education and Preparedness for Disaster Risk Reduction. In: Yildiz, A., Shaw, R. (eds) Disaster and Climate Risk Education. Disaster Risk Reduction. Springer, Singapore. https://doi.org/10.1007/978-981-97-5987-3_9

- form relationships with local community leaders to understand and include perspectives, needs and vulnerabilities in resilience planning
- feed local insights back to the business to support informed major event planning
- maintain a presence at community events to distribute key information, electrical safety advice and energy literacy information
- support energy literacy, including tailored sessions with groups to understand electricity bills and local electrification opportunities.

CSOs will also be prominent figures in the community during and after extreme weather. They will be a direct presence and contact for our on-the-ground response during escalation events, including the communication of outage information, conduit of information to support localised response prioritisation and resolutions, and operate our mobile emergency response vehicles. Their role within our networks is visually demonstrated in figure 8.

FIGURE 8 ESCALATION PROCESS DURING MAJOR WEATHER EVENTS



To deliver on this role, the CSO will deliver on many responsibilities. Examples of some of these are captured at table 6.

TABLE 6 CSO COMMUNITY RESILIENCE RESPONSIBILITIES

TIMEFRAME	RESPONSIBILITY
Preparation phase	• Test resilience through leading trial exercises of steps established in local community resilience plans • Scenario and response modelling with emergency agencies to establish shared understanding of priorities and pathways to an optimal response • Expectation setting with community members, including the presence of MERVs, energy literacy and contact options for communities • Engage with groups experiencing or at-risk of experiencing vulnerability, to ensure understanding of contact options, local of priority households/individuals • Relationship management with large customers to better understand their capacity and limitations to support community operations before, during and after extreme events
Response phase	• Maintain consistent engagement with relevant local community leaders and emergency response agencies • Distribute support materials, messaging or localised causes and timeframes, overviews of the fault response/reconnection process, electrical safety advice and future claims processes • Key point of contact for providing on-the-ground feedback and local insights to the Network Emergency Management Team, including insights into groups experiencing heightened vulnerability • Work with our internal subject matter experts as required to share information on topics including repair complexity, completion timeframes, local configuration and capabilities of the business • Work with other impacted utilities to understand their active vulnerabilities and feed this information back to mutual aid resourcing teams
Recovery phase	• Work with local leads from emergency response agencies to identify groups who need immediate help, are displaced, or are experience heightened vulnerability • Ongoing coordination with impacted utilities and emergency agencies to identify mutual aid resourcing opportunities • Refer impacted customers on for claims processes

This option is consistent with feedback provided during the test and validate phase of our engagement, where stakeholders questioned whether a single CSO could sufficiently cover the geographically broad and diverse needs of local communities (particularly as the frequency and severity of extreme weather increases).

> *"It's a really tough job for one person to do this over (our entire) population"*
>
> *Community Workshop Participant*

Role of a MERV

A MERV will ensure a presence can be maintained across United Energy's network during major events. MERVs are a core component of our on-the-ground operational capabilities during extreme weather, and communities have communicated clear support for investment to ensure MERVs are a permanent presence during events impacting their region.

However, with only one MERV to support a geographic area that spans in excess of 13,000 kilometres of poles and fires, prioritisation decisions will still be required.

Expenditure summary

The costs associated with option two include capital expenditure for the procurement of a MERV and an operating expenditure step change for the labour costs of our CSOs. Forecasts are based on remuneration expectations consistent with the seniority and experience required for the CSO role, and MERV costs reflect our experience with similar fleet.[26]

Costs will also be incurred to operate our MERV fleet, including servicing, petrol and other maintenance. However, these costs are expected to be minimal and have not been included in proposal. Option two will require capital expenditure to procure a MERV and operational expenditure to employ two CSOs. Expenditure under option two is captured at Table 7.

TABLE 7 OPTION TWO: EXPENDITURE ($M, 2026)

OPTION	FY27	FY28	FY29	FY30	FY31	TOTAL
CSOs: operating expenditure	0.3	0.3	0.3	0.3	0.3	1.5
MERVs: capital expenditure	0.3	-	-	-	-	0.3

B.2.3 Option three: three CSOs and one additional MERV

This is similar to option two, however, an additional CSO would be engaged. An additional CSO would supplement the coverage of each emergency area as required, but also play a stronger role for targeted community groups or social advocacy bodies.

This option is responsive to feedback we received from our community workshop to deploy three officers across the network to ensure different regional and urban communities can be represented by officers that maintain established working relationships with key local stakeholders.

The costs associated with this option are summarised in table 8.

[26] MERV costs reflect the purchase of the vehicle, vehicle fit out, and associated labour. CSO costs are based on a $150,000 ($2026) annual salary

TABLE 8 OPTION THREE: EXPENDITURE ($M, 2026)

OPTION	FY27	FY28	FY29	FY30	FY31	TOTAL
CSOs: operating expenditure	0.5	0.5	0.5	0.5	0.5	2.3
MERVS: capital expenditure	0.3	-	-	-	-	0.3

B.3 Preferred option

Option two is preferred as it addresses the identified need of providing best-practice support to communities on our network to improve their resilience to major weather events. In consultation, our customers have maintained clear support for a permanent presence with deep local knowledge to partner with them to plan for their response to extreme weather events, and support them during and after.

Sections of communities experiencing vulnerability have also identified a specific need for tailored engagement built on trust to ensure all members of their community can experience the same resilience outcomes.

Customers further expressed ongoing support for the deployment of MERVs during major weather events, both for the vehicle's strategic coordination capabilities, and their ability to provide communication and support.

Option three was not considered prudent at this stage as we consider that establishing a program and structure for our CSOs is best undertaken incrementally, allowing for the integration of learnings over time.

As noted in the option discussion itself, we consider option one would not meet the identified need as it is inconsistent with sustained and consistent feedback from customers and Government across multiple engagements and independent reviews.

C

IT SITUATIONAL AWARENESS

C Situational awareness

It is not possible to harden our network to avoid all outages, and with the frequency and severity of extreme weather increasing, so too are major 'escalation' events. At the same time, ongoing electrification and behavioural change is increasing dependency on electricity, meaning the impacts of outages are becoming more acute and the restoration process more complex.

When there is an outage, our primary function is to restore supply safely and quickly to as many customers as possible. All else equal, we prioritise making assets safe and restoring our feeder 'backbone' before addressing single customer outages.

Within this approach we maintain operational flexibility to address safety issues, or to target restoration of critical infrastructure and/or specific customers where practicable (or where directed). Our processes need to be dynamic given changing conditions and priorities during extreme weather events.

We also have critical responsibilities in providing accurate and relevant information to customers and key stakeholders throughout the restoration process, including emergency management personnel.

C.1 Identified need

The way in which we prioritise faults, visualise our network and communicate with stakeholders during major events is complex. Conditions evolve quickly, information is often incomplete and constantly changing, and emergency management priorities vary for every event. Further, the sheer scale and scope of information is significant.

Today, our response to widespread outages is heavily dependent on our IT systems. Our response, however, still requires significant use of manual processes that are challenged when the scale of outages increase (as occurs during a major event day).

Recent government reviews and corresponding stakeholder engagement have focused heavily on restoration processes, and expectations on distributors are increasing.

The identified need, therefore, is to ensure we best support a coordinated response to major weather events across our network that meets government and community expectations on the safe and efficient restoration of supply and accounts for the increasing complexity in restoration priorities as our economy and lifestyles rely more heavily on electricity.

C.1.1 Our situational capabilities to support a coordinated response

Our approach to managing restoration is supported by our IT systems. For example, we use near-real time information to support emergency management processes, dispatch crews based on level of priority, support our contact centre to report estimated time of restoration to customers and empower communities through a web-based map of outages.

However, there are limitations within these systems and processes that impact our capability to best support the emergency management process. These reflect the significant reliance on manual processes, the lack of systemised data and limitations in our visualisation tools.

Reliance on manual processes

The prioritisation of faults during a major event day is based on information gathered in near real-time from sources including our contact centre, network information systems and AMI data.

The control room uses this information to manually prioritise faults. This process is repeated for all faults during a major event, with crews dispatched via the control room based on priority.

Notably, this process differs from our typical business-as-usual process, where our fault simulation tool models fault resolutions and is used to test and optimise how our systems and processes prioritise and respond to faults. These tools are designed for optimising steady state operations. They are not designed to be used for major event days as they are not 'trained' on these events, which means they do not consider the wide range of conditions a major outage event entails.

Lack of data systemisation

During a major outage event, the volume of data and its evolving nature represents a significant challenge. The ability to process this information quickly in a systematic manner is fundamental to the ability to make informed decisions.

Our limited capacity to systematise and store datasets in a single location, driven by legacy systems, has led us to store information across disparate systems. This has created challenges to sharing a comprehensive view of our network. Reports containing different datasets can be created and shared, but an iterative, repetitive extraction process would be required to create a comprehensive view of how major weather events are impacting our network.

The flow-on impacts of this are that again, manual extraction processes are required. In particular, the data we store is not immediately accessible by external parties (e.g. emergency response agencies), which undermines or delays our ability to support decision-making during major event days. The rate at which information changes during major events can outstrip our ability to manually extract data in a timely manner for both internal and external needs.

Further, the use of disparate systems means that different internal functions may receive and visualise information differently during major weather events. This can lead to conflicting information.

Limited public visualisation capabilities

The public can access information as to how our network is being impacted during major events by using our outage map. However, information is limited to the broad location of an outage, the number of customers impacted, and an estimated time for restoration, once known.

C.1.2 Government recommendations

The Victorian Government's two reviews into network and community resilience, summarised in section 1.3, have set out clear expectations for distributors around the prioritisation, restoration and coordination of our response efforts.

The 2021 Electricity Distribution Network Resilience Review set expectations that distributors should be more proactive when responding to damage caused by extreme weather and improve communication with customers and local councils during prolonged power outages.

The Victorian Government's response to recommendations of the 2024 Network Outage Review considers distributors should be lead response support agencies for electricity emergencies and committed to driving improved coordination and response.

The government further supported clarifying roles and responsibilities of distributors to establish a stronger understanding amongst emergency services and communities during events. It also committed to increasing the accountability on distributors to be better prepared, and to prevent and respond to major weather events.

Recommendation two of the network outage review set out the attestation we will be required to make annually on our emergency management capabilities. These are shown in figure 9, and form the basis of our options assessment (with a particular focus on communication, impact assessments and restoration prioritisation).

FIGURE 9 NETWORK OUTAGE REVIEW: RECOMMENDATION TWO

Recommendation 2:

Distribution businesses annually attest to the Minister for Energy and Resources as to the currency, completeness, maturity and implementation ability of their emergency risk management practices with regard to maintaining electricity supply, inclusive of assets, people, resources, governance, systems, processes and arrangements with contractors.

The attestation should include specific reference, but not limited to:

Planning and coordination

1. Participation in Regional Emergency Management Planning Committees and Municipal Emergency Management Planning Committees to support response planning for areas at high risk of prolonged power outages.

Communication and engagement with customers and community

2. Application of best practice communication and engagement approaches before, during and after prolonged power outages including:
   a. Inclusive design of customer service systems such as outage trackers and interactive voice response (IVR) systems with regular monitoring, evaluation, and feedback from customers with lived experience of vulnerability.
   b. Capacity of customer service systems to meet surge demand and back-up continuity plans if these services fail.
   c. Capability to provide on-the-ground support to communities during emergencies.

Impact assessment and make-safe actions

3. Adoption and operation of State Emergency Management Priorities including 'make safe'.
4. Ability to undertake rapid impact assessment at a network-wide scale during an event including integration of:
   a. mutual aid resources and state and regional emergency response teams
   b. reports of damaged infrastructure by emergency services personnel and community members
   c. consistent information flow through to the incident response and restoration planning teams
5. Processes to report timely and accurate information about status to restore services and confirm 'safe' infrastructure to emergency services and communities.

Restoration planning, prioritisation and operations

6. Capability and capacity to achieve effective management of events and timely restoration of customers.
7. Review of emergency management practices including but not limited to review of risks and risk controls and testing of revised controls following all major events and exercises.

Temporary generation for key community assets

8. Capacity and capability to connect main streets and key community assets in areas at high risk of prolonged power outages to temporary generation within 12 hours of an event. Information on location of temporary generation sites, network connection points and key access routes should be included in Regional Emergency Management Plans, and Municipal Emergency Management Plans.

C.1.3 Customer expectations

Customers at our 2024 community workshop told us they see more timely and accurate information during extreme weather as key to enhancing resilience. Participants supported investment in our IT systems to support visualisation and prioritisation during widescale outages. They saw a more centralised approach to emergency information as crucial to enhancing our performance during major outage events:

> *"[it] seems like a really good idea. This could speed up times to get crews to location and could saves".*
>
> *Community workshop participant*

Customers also saw investment in our IT situational awareness as an avenue for us to provide accurate and accessible information during emergencies. Customers saw the solution has the potential to empower individuals, build trust through transparency, and improve overall community resilience and wellbeing.

C.2 Options analysis

Three options have been considered to address how we can best support a coordinated and optimised response to outages across our network during major weather events. Each option represents a sequential progression of investment in our existing capability, with a summary of the costs of each option shown in table 9.

TABLE 9 SUMMARY OF OPTION COSTS ($M, 2026)

OPTION		CAPEX	OPEX
1	Base case (no investment)	-	-
2	Enhance our current capability	1.6	0.6
3	Enhanced capability and visualisation	3.1	2.7

C.2.1 Option one: base case (no investment)

As outlined earlier, under recommendation two of the Victorian Government's network outage review, we must attest to our emergency response capabilities on an annual basis.

In the absence of investment, significant manual prioritisation will continue and data will remain stored across disparate systems, challenging our ability to undertake rapid scale assessments of our network, as the complexity of widespread outages increase with electrification and changing weather patterns. This will inhibit our ability to progress beyond manual processing and responses to faults during escalation events.

The Victorian Government expects a timely flow of information to restoration and response parties. Our current approach to data curation means that extraction upon request from third parties requires significant time and resources. It also constrains the flow of information to incident response and restoration teams. As weather events become more frequent and severe and datasets more complex, we will experience challenges sharing information in a timely manner.

The absence of automated fault simulation and prioritisation capabilities at the scale required for escalation events will also forego opportunities to review, test and learn from previous events.

C.2.2 Option two: enhanced capability

Option two enhances our existing capabilities to better visualise and communicate major weather events, and our capability to prepare for and respond to widespread outages.

Investment under option two improves our ability to meet Victorian Government expectations to support a coordinated response to network outages. However, ongoing requirements to manually extract and share data will still challenge our ability to support constant information flow to incident response and restoration teams.

While upgraded, our fault simulation capabilities will not have the sophistication to support detailed revision and testing of fault restoration policies and procedures.

Visualisation and data provision

Under option two, our GIS software will be upgraded to store datasets that can be manually extracted to meet information requests from external parties. Datasets will be curated and stored in consistent formats for shared use and understanding.

In practice, this means that stakeholders will receive information more quickly than under the base case. However, manual extraction is a resource intensive process. Under option two we will continue to face challenges sharing information at a pace that matches the rate of change during major weather events, particularly as datasets become more complex. This could mean that by the time we have prepared the information to be shared with third parties it is already out of date.

Our upgraded GIS software will also contain new visualisation layers, such as the location of community assets, restoration priorities, and high-risk locations. This will facilitate better oversight of where priorities and vulnerabilities lie within communities, ensuring that we can better identify those that need help the most.

Optimised fault response

Developments in machine learning have created an opportunity to provide improved decision-support to our dispatch teams. This can be achieved by using simulations of fault response scenarios during widescale outages to choose optimal fault response pathways. Option two would leverage this opportunity to enhance our existing simulation capabilities, allowing us to better capture how major weather events will impact our network.

Our existing fault simulation capabilities will be upgraded to allow us to model outcomes that may occur during a major outage event. These outcomes will provide decision support to our control room when prioritising fault restoration. While improved compared to option one, we would still have limited capabilities as to the number of scenarios we are able to model and limited ability to use new information gathered from recent major events to review and configure our fault prioritisation approach.

C.2.3 Option three: further enhanced capability and public view

Option three prioritises further collaboration with emergency response agencies and our communities in recognition that electrification and the increasing frequency and severity of weather events across our network is necessitating an increasingly complex, coordinated response.

Option three will automate data extraction processes, creating opportunities for two-way sharing of information that doesn't exist today. In this way, option three creates a more informed, shared understanding of how weather events are impacting the network that keeps pace with changing circumstances.

It is also responsive to the expectations that communities have communicated to us through consultation since 2021. With communities seeking to access more in-depth, real-time data, to aid in their own decision-making processes during extreme weather events.

Visualisation

Relative to option two, option three prioritises investment in our ability to support a shared understanding of major outage events. Under option three, our GIS software is upgraded to create a visualisation layer that acts as a near real-time single source of truth for all stakeholders. It would enable:

- complete datasets to be stored, updated and shared in near real time
- emergency response agencies to self-service data extraction needs, meaning external stakeholders can access critical information in near real time
- better collaboration with external parties through the ability for emergency agencies to upload information into our system
- integration of datasets with bushfire and flood overlays, live weather and storm cells.

Optimised fault response

Relative to option two, option three further enhances our fault simulation capabilities to consider outcomes with increased sophistication. In practice, this means that more informed scenario analysis can be undertaken to assess the efficacy of different restoration strategies.

During major events, the outcomes of our fault simulation will provide improved decision-support to our network control centre. Post event, fault simulation will enable us to consistently review and update fault restoration policies utilising significant amounts of data from recent major events.

C.3 Option analysis

Improved coordination between agencies, more informed customer decision-making and an optimised fault response is expected to lead to reduced minutes off supply for many customers and/or an improved customer experience (relative to the status quo). However, the impact of each major event day is different, and the challenges communities face vary greatly, influenced by factors such as location, topography and size. Quantifying the impact of investment at a network level, therefore, risks mischaracterising how communities may be impacted.

Accordingly, much of the analysis of our preferred option is qualitative, with a focus on assessing each option against how it would enable us to meet the expectations set by the Victorian Government in response to increasingly frequent and severe weather events.

Notwithstanding this, the quantifiable benefits of each option, including reduced customer minutes off supply and energy at risk, and the corresponding costs for each option are set out in further detail in our attached IT situational awareness cost and risk models.[27] A summary of the quantifiable present value of costs and benefits is set out in table 10.[28]

TABLE 10 OPTIONS ANALYSIS: SUMMARY ($M, 2026)

OPTION		PV COSTS	PV BENEFITS	NET BENEFIT
1	Base case (no investment)	-	-	
2	Enhance our current capability	(6.7)	6.4	(0.3)
3	Enhanced capability and visualisation	(21.7)	24.3	2.6

C.4 Preferred option

Option three, enhanced capability and visualisation, is preferred as it is the most responsive option to both customer and government expectations while also delivering the highest economic benefit.

Through both its network resilience and outage reviews, the Victorian Government has set clear expectations that we must improve how we prioritise restoration and support a coordinated, optimised

[27] UE MOD 5.01 - IT situational awareness cost - Jan2025 - Public; UE MOD 5.02 - IT situational awareness risk - Jan2025 - Public

[28] This includes costs and benefits associated with both Powercor and United Energy. Enhancing our capabilities for one network would make the technology available to the other, we have therefore split the costs of the enhanced capabilities equally between the two networks. However, for the purposes of modelling we have considered the full cost of the enhanced capabilities and the full benefits together.

response during major events through the 2026–31 regulatory period. Our customers have consistently expressed strong support for investments to enhance resilience and have told us that a key component of this is access to transparent, timely and accurate information.

Investing to enhance our current capabilities and establish more in-depth view of major weather events across our network is a direct response to these expectations. Table 11 maps proposed investments against the emergency risk management practices that we are expected to attest to under recommendation two of the network outage review.

TABLE 11 MAPPING OUR PROPOSED INVESTMENT AGAINST EMERGENCY RISK MANAGEMENT PRACTICES

EMERGENCY RISK MANAGEMENT PRACTICE	PROPOSED INVESTMENT
Application of best practice communication and engagement approaches before, during and after prolonged outages.	• Upgraded GIS capabilities enable us to create a more in-depth, community specific, visualisation of a major event.
Ability to undertake a rapid assessment at a network-wide scale during an event including integration of: • Mutual aid resources and state and regional emergency response teams. • Reports of damaged infrastructure by emergency services personnel and community members • Consistent information flow through to the incident response and restoration planning teams	• A visualisation layer becomes the single source for extraction of data, where emergency response agencies are able to access this visualisation, download and upload their own information for collaboration. • Data is systematised within the visualisation layer, meaning all parties are informed by consistent datasets. • Upgrading our fault simulation capabilities to better model the range of possible outcomes present at major event day-scale. • Provide decision support to our network control centre by informing our fault prioritisation process with fault simulation outcomes.
Review of emergency management practices, including review and testing of risk and risk controls, and testing of revised controls following major event days.	• Upgraded fault simulation capabilities are utilised to model fault restoration priorities ahead of major events, and review against outcomes post events.

The expenditure required to deliver option three is set out in table 12.

TABLE 12 PREFERRED OPTION EXPENDITURE FORECAST ($M, 2026)

OPTION THREE	FY27	FY28	FY29	FY30	FY31	TOTAL
Capital expenditure	2.9	0.2	-	-	-	3.1
Operating expenditure	0.5	0.5	0.5	0.5	0.5	2.7

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