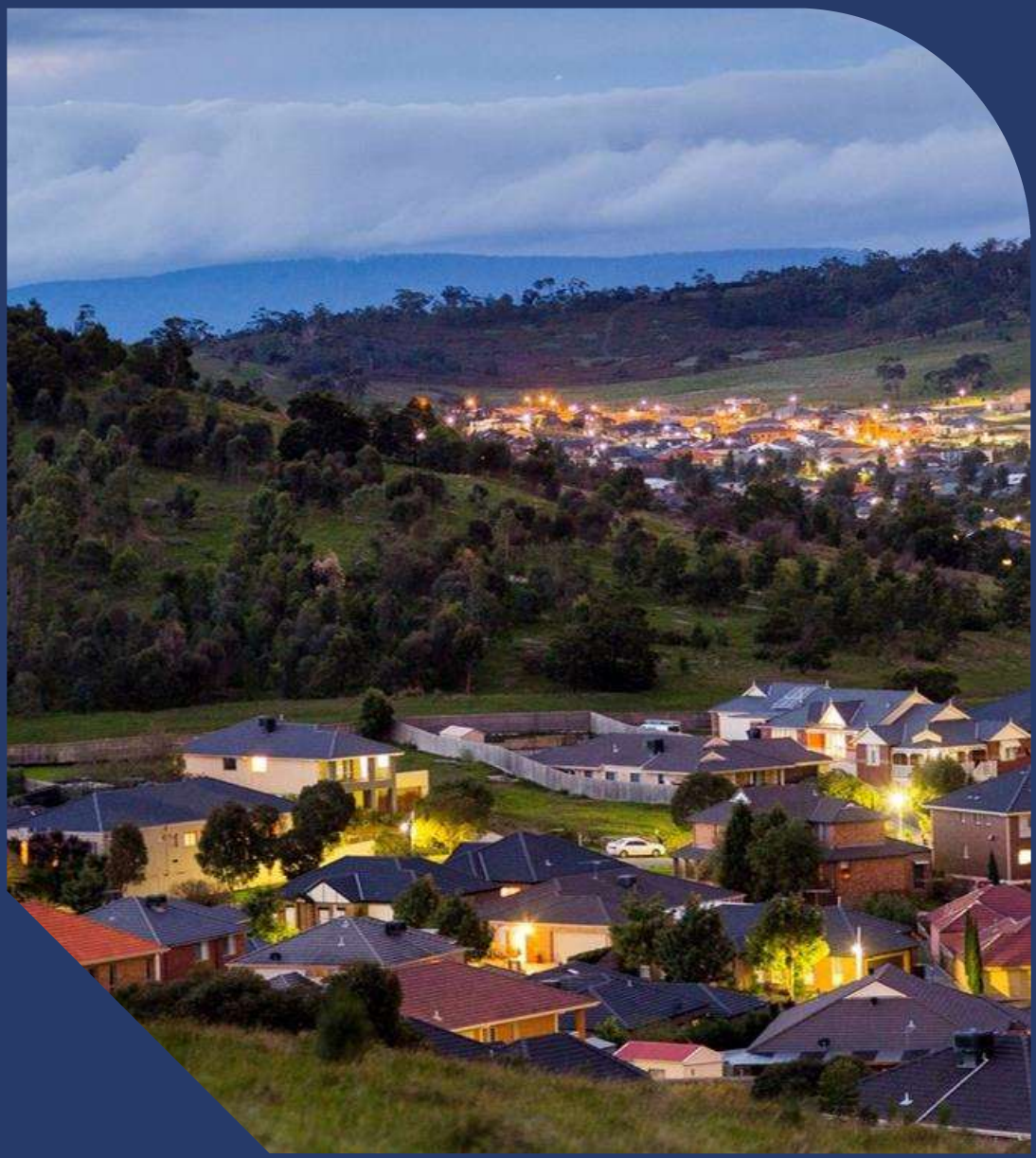
AusNet

Resilience Strategy

Friday, 31 January 2025



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1. Executive summary

Resilience has rightly received increased attention from Government and regulators in response to recent storm events in Victoria, specifically the June 2021, October 2021, February 2024 and September 2024 storms. We have also focused significant resources on the lessons learnt, including from the catastrophic storm event in February 2024 that damaged 12,000 km of powerlines and poles across the state's electricity distribution businesses, and resulted in more than 297,000[1] of our customers being off supply. The February 2024 storm was the most impactful weather event in AusNet's history.

As a result of this increased focus on resilience, the regulatory framework in which we operate is changing.

- New obligations will be placed on Victorian distribution businesses to produce 5-yearly resilience plan where civil penalties will apply if not delivered.
- Victorian Government has submitted a rule change request to the AEMC which, if approved, will add network resilience to the capital and operating expenditure factors. The rule change would require the AER to explicitly consider network resilience when setting revenues in regulatory determinations.
- The Expert Panel for the Network Outage Review has recommended, and the Victorian Government have provided their support in principle, for a minimum service level standard for feeders, which if breached, would require remediation by network businesses.
- The Victorian Government have also provided their support for the following:
  - A new Extended Loss of Supply Support Payment Scheme (**ELOSS**) which requires distribution businesses to financially support customers during prolonged power outages; and
  - An AusNet specific licence condition, to be implemented as soon as practicable, to improve reliability of specified feeders and the installation of network connection points in key township locations.
- The Australian Energy Regulator (**AER**) published their final decision on the Value of Network Resilience (**VNR**) that attaches a value (in $ per kWh) to outages greater than 12 hours, that would allow prolonged outages to be recognised in the cost-benefit analysis.
- Additionally, the AER recently published its final report for the 2024 Value of Customer Reliability (**VCR**). The 2024 VCR for residential customers in Victoria has almost doubled (from **$25.13/kWh** in 2023 to **$49.23** in 2024) while the business VCRs have almost halved. Some of the key reasons behind the increase in residential VCR relates to the increased importance of electricity, customer perceptions and lived experience from recent high profile outage events and changes in working from home arrangements.

AusNet welcomes and supports these developments. We also recognise that we cannot wait for the regulatory framework to be settled before responding to the increasing challenges from climate change and electrification, which will reinforce the dependency of our customers and their communities on electricity as their principal source of energy. This resilience strategy therefore sets out our current thinking in relation to the actions that we should take to meet our customers' needs for improved resilience.

Our approach to this resilience strategy has been informed by customer feedback and research, including the findings from reviews conducted by the Victorian Government and our own customer research into the value that customers place on resilience. A key finding from this latter research, which was designed with the involvement of our Research and Engagement Panel, is that resilience has the highest value of all the benefit streams quantified – the willingness to pay among residential and business customers are **$39.6** per customer p.a. and **$178.7** per business customer p.a.). This is consistent with the results from our customer surveys and the other anecdotal feedback obtained from our customer engagement activities.

While customer feedback and research have been important in enabling us to establish frameworks to develop our resilience plans, our extensive engagement with our Electricity Availability Panel has been key to providing deeper insights into how we should balance and coordinate our efforts to deliver optimal outcomes for our customers. Specifically, some of the key themes from our engagement with the Electricity Availability Panel include:

- While affordability remains an important consideration for customers, there is a strong case for a resilience program which seeks to improve customer outcomes.
- The linkages between AusNet's expenditure plans, which includes resilience and reliability expenditure to improve the worst performing feeders, must be carefully assessed to ensure that the benefits of the expenditure are not double counted.
- Communication is a key element in ameliorating the impacts of a storm event. Maintaining communications, including telecommunications, is essential. The provision of timely and accurate information to customers regarding restoration times is also of considerable value.

[1] Other sources reference 255k customers which is the coincident peak customers off supply.

- Community hubs are important in supporting communities and facilitating greater resilience. While AusNet may have a role in powering and supporting community hubs, it is important that any efforts are tailored to meet the specific needs of each community which will vary significantly.
- To deliver more resilient outcomes for customers, it is appropriate to consider the full spectrum of potential activities from prevention through to restoration.
- Standard 'cost-benefit' analysis of the kind that applies to traditional network investments may not be appropriate in developing AusNet's resilience expenditure plans. For example, there is a strong case for improving the performance of the worst performing feeders (which will also provide a more resilient network) from an equity perspective.

To optimise our investment plans, we have developed a 'balanced response framework', which explains how resilience expenditure should be balanced between 'prevent and prepare' and 'respond and recover' initiatives in a coordinated manner to deliver the best outcome for customers. Having regard to this framework and the feedback from our Electricity Availability Panel, we have developed capital expenditure plans across the following categories to improve resilience:

- **Network hardening** are infrastructure assets upgrades or improvements, primarily designed to allow the network to better withstand extreme weather events e.g., replacing wooden poles with concrete or composite poles and undergrounding overhead cables.
- **Non-network solutions** are non-traditional solutions designed to displace or defer the need for capital intensive augmentation expenditure e.g., standalone power systems (SAPS).
- **Digital solutions** are investment in systems and processes to avoid outages and reduce their duration. For example, this includes investment in our Advanced Distribution Management System (**ADMS**) which is computer system that controls the network, logs outages, and calculates estimated response. While these digital investments improve resilience, they also provide significant benefits in other operational areas.
- **Other capital expenditure**, which includes investments in emergency response vehicles and mobile generation.

In addition to the capital expenditure solutions described above, we have also identified operating expenditure activities to improve resilience:

- **Hazard tree program (opex step change)**, which involves an expansion of our existing program to reduce the risk that storm activity results in tree falls that cause outages.
- **Preparedness and response (opex step change),** this expenditure will increase our capacity to respond to extreme weather events to reduce the impact on our customers e.g. by increasing the number of emergency management specialists.

In developing our resilience expenditure plans, we have conducted detailed cost-benefit analysis and tested the results with our Electricity Availability Panel. While resilience expenditure is a relatively new expenditure category which will continue to evolve, we have adopted a comprehensive approach to ensure that the proposed expenditure is prudent and efficient. Specifically, we consider that our proposed resilience program will improve service outcomes for our customers and their communities while having regard to affordability concerns.

The tables below provide a summary of our resilience program and the associated bill impacts. The bill impact of our resilience program for residential customers (**$9.2** per residential customer per year) is below the willingness-to-pay that we have quantified through our research (**$39.6** per residential customer per year). Similarly, the bill impact for business customers is significantly below their willingness-to-pay (**$45.9** per business customer per year vs. willingness-to-pay of $**178.68** per business customer per annum).

This resilience strategy will be updated periodically, in response to future reviews of the effectiveness of our resilience program and feedback from our customers.

Table 1 Summary of our resilience program for the 2026-31 regulatory period

	Capex (direct, real 2023-24)	Opex (real 2025-26)
Resilience program	Network hardening[2]: • Pole hardening $65.5m • Covered conductors $29.5m • Undergrounding $93.4m • Switches $18.7m Others: • SAPS $6.2m • Power backup for community hubs $9m • Mobile generation $3m • Emergency response vehicles $1m **Total $226.4m over 2026-31**	• Hazard trees opex step change $15m • Preparedness & response opex step change $9.2m **Total $24.2m over 2026-31**
Resilience related digital investments	• ADMS $60.4m • Field enablement $17.1m • Network model management $38.6m **Total $116.1m over 2026-31**	

Table 2 Bill impact of our resilience program (including overheads, real 2025-26)

	Residential customers	Non-residential customers
Resilience program excluding digital	$9.2 per customer per year over 2026-31	$45.9 per customer per year over 2026-31
Resilience program including digital	$18.1 per customer per year over 2026-31	$90.5 per customer per year over 2026-31

Source: AusNet.

[2] Values are net of forecast of STPIS benefits.

2. Purpose

Electricity networks face growing challenges from the increasing frequency and severity of extreme weather events. Resilience means having the investments and capabilities in place to withstand and recover from disruptions, including extreme weather events.

This document is our Resilience Strategy which describes our vision and approach for ensuring that we factor resilience into our decision-making, so that we deliver optimal outcomes for our customers when disruptive events occur. The Resilience Strategy articulates our plan for achieving our vision. It has been developed with the assistance of our Electricity Availability panel who provided feedback from a customer's perspective. The Electricity Availability panel has been invaluable in enabling us to better understand our customers' preferences regarding how we balance our resilience expenditure against other objectives, including affordability.

It is important at the outset to recognise that resilience is a relatively new concept in electricity networks, and one that potentially overlaps with other aspects of our plans, including our reliability expenditure to improve the performance of our worst performing feeders. Furthermore, in contrast with other expenditure categories, the concept of resilience is broader than electricity supply alone. In particular, resilience for a community means supporting our customers when they are in need, including through providing accurate and timely updates and the availability of community hubs to serve as a meeting point with some essential services such as a place to charge mobile devices.

At a high level, the contributions that we can make to enhance resilience can be described in four inter-related segments, as shown in Figure 1 below.

Figure 1: Four elements of a resilient network service

Source: AusNet.

The challenge for us is to balance our efforts across these four segments to deliver the best outcome for our customers and the communities in which they live. In addition to combining our efforts across these segments, there is a variety of initiatives that could be undertaken to improve outcomes for our customers. In discussing the experience of our customers through recent storm events, it is clear that we need to think more broadly than has traditionally been the case in relation to network services, particularly as our efforts need to dovetail with other providers, our customers and their communities to deliver the best value for money.

Our Resilience Strategy is an input into business strategies.

We have adopted the frameworks in this Resilience Strategy to develop our resilience program for 2026-31. This Resilience Strategy will be updated periodically, in response to future reviews of the effectiveness of our resilience program and feedback from our customers.

3. Vision, goals and strategic priorities

As an essential service, reliable electricity supply is critical to the customers and communities we serve, and its importance will continue to increase through electrification of our energy needs. At the same time, our climate is changing, and extreme weather events are increasingly common and on a larger scale. The increasing reliance on electricity combined with more extreme weather events has exposed the vulnerability of electricity networks to major disruption and the cascading impacts for customers.

Natural hazard events may be caused by a number of factors, including high winds, high rainfall, hailstorms, lightning strikes, localised or widespread flooding, localised or widespread bushfires, and coastal surges. These events may lead to outages that are prolonged (longer than 12 hours) and/or widespread (in terms of the geographic area and the number of customers affected). Resilience does not require the complete prevention or avoidance of impact on the power system, but a degree of mitigation and the containment of the impact of the events when they occur. In addition, community resilience is greatly assisted if hubs can be established where people are able to go for information, food, fuel, to charge phones or computers, showers and general support.[3]

Figure 2 below sets out our vision, goals and strategic pillars for resilience, which are consistent with AusNet's company vision which is to be trusted to bring the energy today and build a cleaner tomorrow.

Figure 2: Resilience vision and goals

Source: AusNet.

Our vision recognises that our customers and the wider community expect us to be prepared for extreme weather events. Our goals are also entirely customer-focused, recognising the linkages with increasing electrification and dependence on electricity; the value customers place on our adequacy of our response; and the importance of investing in a way that makes a meaningful difference to customer outcomes. Our strategic pillars describe the types of actions that we can make to facilitate greater resilience to extreme weather events, recognising that these actions extend well beyond traditional network investments to include expenditure in emergency response, communications and digital technology.

As explained in section 5.3 of this strategy, our proposed resilience expenditure program has been informed by our engagement with our Electricity Availability Panel and consumers more broadly, who have helped us to target our efforts to best meet the needs of our customers and communities. While this Resilience Strategy formalises our approach to improving resilience for the first time, it is important to acknowledge that this has been an area of increasing focus for AusNet, our customers, the Victorian Government and industry regulators, which we discuss next. In this Resilience Strategy, we build on the initiatives that we have already undertaken to consider how best we can meet our customer and community needs in relation to resilience prudently and efficiently.

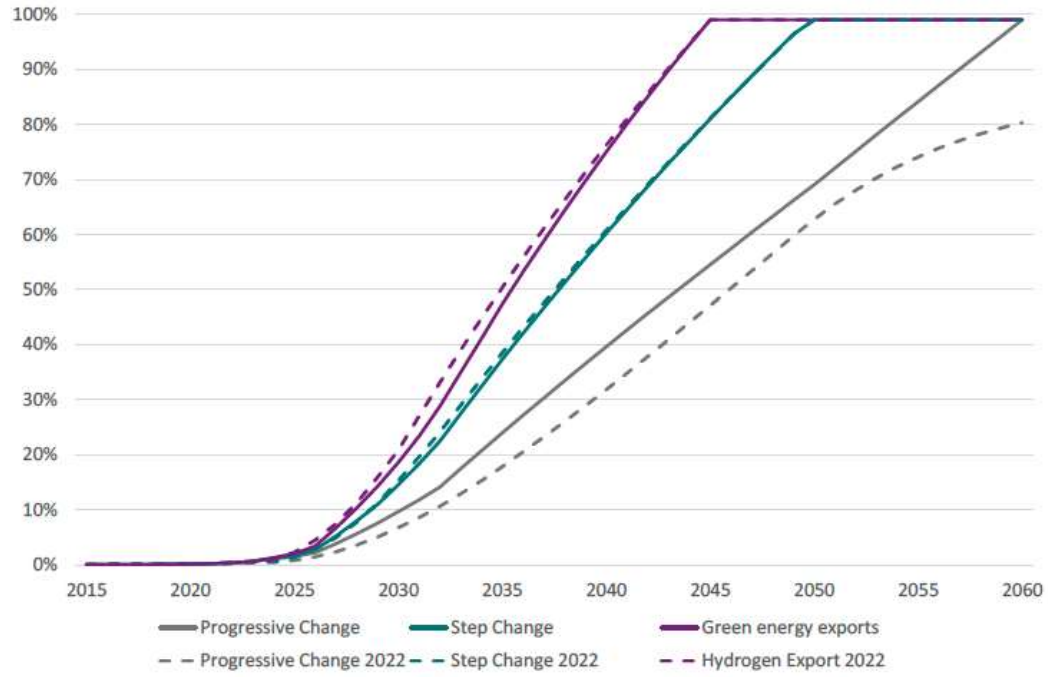
[3] Expert Panel, Electricity Distribution Network Resilience Review, Final Recommendations Report, May 2022 page xiii.

4. Background and context

4.1. Impact of losing supply

Over time, the effective functioning of the communities in which we live has become increasingly dependent on a reliable electricity supply. Looking forward, community dependency on electricity supply will likely increase as electrification increases. For example, the electrification of the transport sector and switching from gas supply will continue to gather pace as Australia transitions to net zero. To illustrate these trends, Figure 3 shows the projected growth in the market share of electric vehicles for each of three scenarios in AEMO's 2024 ISP.

Figure 3: CSIRO's projected electric vehicle market share



Source: AEMO 2024 ISP.

The projected growth in electric vehicles is an indication that communities are likely to become increasingly dependent on reliable electricity supply over time. While dependency on reliable electricity supply will only increase over time, losing electricity supply for a prolonged period already causes huge disruption to peoples' lives and livelihoods, and therefore is a source of considerable distress.

As well as finding themselves without power and the ability to heat their homes, in some cases customers may be without water and sewerage services, communications and other services that are dependent on the power supply. For the elderly, those with disabilities and/or requiring power for medical devices, and those with young families, the impact will be even more significant. Businesses are also significantly affected by loss of supply, with many businesses being unable to trade or maintain production, further affecting the communities they serve.

Following the February 2024 storms, we invited our customers to tell us about how the extended outages affected them. The feedback we received summarises how the loss of electricity supply affects many aspects of our lives:

- **Inability to access essential services**. Lost food and lost access to key utilities such as water, telecommunications, sewage and heating/cooling.
- **Financial impact**. Expenses including spoiled food, time off work, alternative energy costs, and reduced business income.
- **Work and school**. Inability to work and disruption to schooling.
- **Making alternative plans**. Lack of information makes it very difficult to plan to minimise the impact of an outage on households and businesses.
- **Access to immediate support**. Many people needed extra support but often do not know where to go for help.

4.2. Climate change and storm events

The impacts of climate change are already being observed in Victoria, with the state's communities, economy, and environment already feeling its effects. Victoria's climate is projected to experience an increase in the intensity and frequency of extreme weather events including floods, heatwaves, and bushfires, as well as longer term changes in climate including higher average temperatures, reduced average rainfall and higher sea levels. This will change the profile of existing risks that AusNet manages, and potentially create new risks.

The Intergovernmental Panel on Climate Change (**IPCC**) has outlined four scenarios to explore future concentrations of greenhouse gases in the atmosphere, referred to as Representative Concentration Pathways (**RCPs**). These range from very low concentrations (RCP 2.6) to high concentrations (RCP 8.5). Each RCP reflects a different concentration based on assumptions of different combinations of possible future economic, technological, demographic, policy and institutional trajectories.

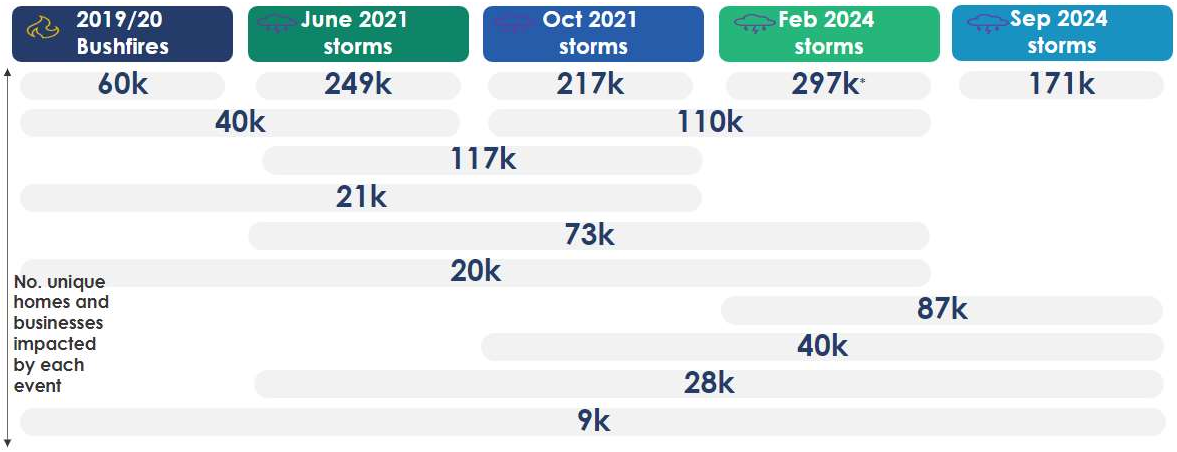
Under both a moderate and high emissions scenario, average temperatures and windspeeds are expected to continue to increase. As warming continues, the region will have more extreme heat events. The warmer climate is expected to bring more heavy rainfall events. At the same time, annual rainfall is likely to continue to decline, with the greatest drying in the spring. Over the past few years, we have experienced extreme weather events that have caused some of our worst outages on record:

- **2019/20 bushfires**: The "Black Summer" bushfires caused widespread devastation across regional areas and in total, 1,000km of AusNet's powerlines were affected resulting in 60,000 of our customers being off supply. Over 1.5 million hectares were burnt in the fires and more than 300 homes were destroyed. This was the first time the Victorian Government declared a state of disaster.
- **June 2021 storms**: On 9 June 2021, major storms caused widespread damage across Victoria. Parts of Victoria recorded more than 280 mm of rain and experienced wind gusts of more than 100 km per hour. Three days after the event, 68,000 customers remained off supply, while more than 9,000 customers remained without supply a week later. At the time, it was the largest storm on record. In total, fourteen 66kV powerlines were taken out of service, fifty-eight 22kV powerlines reported faults and 10 zone substations went black in AusNet's distribution area. This resulted in 249,000 customers being off supply.
- **October 2021 storms**: On 29 October 2021 (within months of the June 21 storm) another storm event created widespread devastation. Damaging winds (e.g., 146 km/h at Wilsons Promontory) rain and hail hit Western Victoria, the southwest and Metro Melbourne. As a result, nearly 530,000 customers across Victoria were off supply at peak. Three days after the event, approximately 24,000 customers remained off supply, with over 2,500 customers still without supply after one week.
- **February 2024 storms**: On February 13, 2024, Victoria experienced a catastrophic storm event that damaged 12,000 km of powerlines and poles across the state's electricity distribution businesses, causing widespread power outages. Six 500kV transmission towers collapsed and AEMO instructed load-shedding of approximately 92,000 customers, state-wide. The February 2024 storm is the largest that AusNet has experienced, resulting in more than 297,000[4] of our customers being off supply.
- **September 2024 storms**: On 1 September 2024 (less than seven months after the February 2024 storms), a severe storm caused widespread damage across Victoria, affecting many of the same customers as the February 2024 storm (approximately 87k customers were affected by both February and September 2024 storms).

Figure 4 shows that 28,000 homes and businesses were impacted by all four major storms, and 9,000 customers were impacted by all five events.

[4] Other sources reference 255k customers which is the coincident peak customers off supply.

Figure 4: Summary of the number of AusNet's customers affected by the five natural disasters since 2019



Source: AusNet.

As explained in the Victorian Government's Network Outage Review, these events highlight that distribution businesses no longer operate in an environment which is 'steady state', the potential for weather and security events that cause impacts at scale is real. This requires a step change in distribution businesses preparedness, response, and recovery from these events to protect the reliability of power Victorians value and to protect the ecosystem of essential services that electricity distribution networks sustain.[5]

For each storm event, consistent with our emergency management protocols, we conduct a post-incident review (**PIR**) to consider how best to improve our performance. Following the February 2024 storms, we engaged Nous Group to conduct an independent PIR and make recommendations for improvement. As part of its review, Nous Group established a framework for capturing our customers' expectations during an outage event, and the areas of analysis that follow from the three pillars of service and operations; communication and information; and community engagement and support. We will discuss this framework in section 6.

4.3. Regulatory drivers

The impact of climate change and the increased frequency and intensity of storm events has led to a reconsideration of the regulatory framework and whether it provides appropriate incentives in relation to network resilience. The figure below provides a snapshot of the reviews conducted in 2022 that discussed these issues and reviews that were completed in 2024.

Figure 5: Recent reviews on storm responses and the regulatory framework

2022: Electricity Distribution Network Resilience Review

2022: AER guidance to include resilience as an expenditure category

2024: Victorian Government Network Outage Review

2024: AER Valuing Network Resilience / Final report on VCR

Another area of attention is the AER's Service Target Performance Incentive Scheme (**STPIS**), which is intended to balance incentives on network service providers to reduce expenditure with the need to maintain or improve service performance. The STPIS achieves this objective by providing financial incentives to maintain and improve service performance where customers are willing to pay for these improvements, as estimated by the Value of Customer Reliability (**VCR**).

In calculating the STPIS reward/penalty, however, certain extreme weather events, known as major event days, are excluded from the calculation. In this regard, the STPIS is not designed to incentivise improvements in managing the effect of unforeseen extreme weather events. For that reason, the regulatory framework does not provide appropriate incentives to focus on resilience, even though it is a dimension of service performance that is of growing importance to electricity customers.

[5] Victorian Government, Network Review into the transmission and distribution businesses operational response to the 13 February 2024 Storms, Final Report, June 2024, page 14.

In 2021, the Victorian Government initiated a review in response to the severe storms in June and October 2021.[6] An Expert Panel was appointed to lead Phase 2 of the review to advise the Government on how the electricity distribution businesses can help reduce the likelihood and impact of prolonged power outages, to help build community resilience. Following this review, the Victorian Government supported the Panel's recommendations that:

- A rule change should be introduced so that resilience is specifically identified as a capital expenditure objective.
- Victorian distributors should be required to develop a network resilience plan every 5-years.
- Further investigation should be undertaken into customers' willingness to pay for resilience, which the Panel described as "proactive measures to avoid or mitigate the impacts of natural disaster events".

We note that a rule change has been submitted to the AEMC with the draft determination due in February 2025. The AER's review on the Value of Network Resilience addresses the third dot point above.

In April 2022, the AER published a guidance note to help networks and consumer groups understand how resilience investments are assessed under the current regulatory framework. The AER explained that reliability (as distinct from resilience) is defined as the probability of a system, device, plant or equipment performing its function adequately for the period of time intended, under the operating conditions encountered. The AER noted that there is a close relationship between resilience and reliability because resilience is an input that contributes to the achievement of reliability.[7]

The AER's guidance note explained that it expected network service providers to support the case for resilience expenditure by demonstrating, within reason, that:

- There is a causal relationship between the proposed resilience expenditure and the expected increase in 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.

Following the February 2024 storms, the Victorian Government established a Network Outage Review to investigate the network companies' responses to the February 2024 storms. The final report commented that the increasing severity and frequency of severe storm events of recent years is not something the 'steady state' regulatory framework - that provides incremental and progressive efficiencies and improvement - was designed to address. The report therefore advocated a greater focus on network performance, particularly for worst performing feeders, so that networks are better prepared for, mitigate, and respond to extreme events.[8]

The Network Outage Review report recommended, and the Victorian Government have provided their support for:

- A minimum service level standard for feeders, which if breached, would require remediation by network businesses.
- A new Extended Loss of Supply Support Payment Scheme (ELOSS) which requires distribution businesses to financially support customers during prolonged power outages.
- An AusNet specific licence condition, to be implemented as soon as practicable, to improve reliability of specified feeders and the installation of network connection points in key township locations.

On 1 March 2024, the Energy and Climate Change Ministerial Council (**ECMC**) requested that the AER extends its review of VCR to establish a value of customer resilience associated with long duration outages. The AER published an issues paper on the Value of Network Resilience (**VNR**) in May 2024. In that issues paper, the AER explained that it intended to provide an estimate of the VNR by September 2024 to allow the Victorian distributors time to review and apply the VNR in their proposals, particularly as it expected resilience investment would be a key feature of some proposals. The AER published its final decision in September 2024, and we have applied the VNR in the development of our resilience program. The VNR is not a specific amount or amounts, instead it is based on applying multipliers to the VCRs, with an upper limit for residential customers.

Additionally, the AER recently published its final report for the 2024 Value of Customer Reliability (VCR). The 2024 VCR for residential customers in Victoria has almost doubled (from $25.13/kWh in 2023 to $49.23 in 2024) while the business VCRs have almost halved. Some of the key reasons behind the increase in residential VCR relates to the increased importance of electricity, customer perceptions and lived experience from recent high profile outage events and changes in working from home arrangements.

AusNet welcomes the increased focus on the effectiveness of the regulatory framework in promoting prudent and efficient resilience expenditure.

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[6] Victorian Government, Electricity Distribution Network Resilience Review, 2022.
[7] AER, Network resilience - A note on key issues, April 2022, page 6.
[8] Victorian Government, Network Outage Review, Review into the transmission and distribution businesses operational response to the 13 February 2024 Storms, Interim Report, June 2024, page 56.

4.4. Potential options to improve resilience

As explained in the previous section, the AER's assessment of the VNR is an estimate of the value that customers obtain from a resilient network, either in reduced outage probability and/or duration. By adopting the VNR, a network service provider will be able to compare the costs and benefits of undertaking expenditure to improve resilience. As explained in this Resilience Strategy, the choice of resilience solutions must have regard to their effectiveness in meeting our customers' needs, which is assessed by having regard to those aspects of resilience that are most valued by our customers and justified from a cost-benefit perspective.

At a high level, there are four capital expenditure activities that could improve resilience:

- **Network hardening** are infrastructure assets upgrades or improvements, primarily designed to allow the network to better withstand extreme weather events e.g., replacing wooden poles with concrete or composite poles and undergrounding overhead cables.
- **Non-network solutions,** which include:
  - Standalone power systems (**SAPS**), which reduce the dependency of communities on our network assets.
  - Community resilience hubs, which would equip rural community centres with backup generation and energy storage to provide critical services and emergency functions during long duration outages.
- **Digital solutions,** involves investment in systems and processes to avoid outages and reduce their duration, which may include (**ADMS**). ADMS is the computer system that controls the network, logs outages, and calculates estimated response times. Improved integration with our other digital systems and data sources will also greatly assist in reducing outage duration times.
- **Other capital expenditure**, which includes:
  - Emergency response vehicle are purpose-built fleets equipped to travel through challenging conditions and can offer essential services such as mobile power generation, communication support, and first aid provisions to affected customers.
  - Mobile diesel generators are units that can be quickly deployed to locations with prolonged outages to provide immediate power to the local community.

In addition to capital expenditure solutions, resilience may also be enhanced through increased operating expenditure, which may include:

- **Hazard tree program**, which would involve an expansion of our existing program to reduce the risk that storm activity results in tree falls that cause outages.
- **Preparedness and response,** this expenditure will increase our capacity to respond to the storm events to reduce the impact on our customers e.g. by increasing the number of emergency management specialists.

5. Understanding customer preferences and willingness to pay

5.1. Customer research

At Ausnet, we are committed to undertaking customer research to help us understand our customers' needs, experiences, perceptions and behaviours regarding energy use and interactions with our services. This information allows us to improve our customers' experience based on informed, data-driven decisions. Figure 6 below provides a snapshot of depth and breadth of the customer engagement and feedback which has been factored into this Resilience Strategy.

Figure 6: A list of AusNet's customer research and engagement on resilience

Source: AusNet.

Customer research is particularly important in formulating this Resilience Strategy because customer feedback helps us make decisions on how best to focus our efforts so that we target outcomes that are valued most highly by our customers. For example, in December 2023 we undertook a survey of our customers who had experienced outages that exceeded 12 hours in the previous month to understand how the outages had affected their lives. From the 484 customers that responded, the following themes emerged:

- Loss of food and disruption to plans.
- Inability to work from home.
- Implications for personal health and safety, with 85% of electricity customers identifying stress and anxiety as one of the major impacts from the outage.

In addition to undertaking our own research, our customers have also participated in extensive research and engagement undertaken in Government-led reviews into the recent storms, as described in section 4.2. We have also engaged extensively with our Electricity Availability Panel in developing our Resilience Strategy and the proposed resilience program. This engagement has included deep dive sessions that examine our approach to resilience and the resulting plans, we discuss the invaluable input from our Electricity Availability Panel later in this chapter.

5.2. Estimating the value of resilience

From an economic perspective, a central aspect of any expenditure plan is a demonstration that it will deliver an overall net benefit to customers. To better understand the value that customers place on the different aspects of the services we provide, including resilience, we undertook a Quantifying Customer Values (**QCV**) study. The study duplicated the AER's 2019 VCR survey methodology and comprised:

- A qualitative phase involving 12 in-depth interviews.
- A total of five customer workshops with approximately 120 customers.
- A quantitative phase that involved an online survey of 3,178 residential and 349 business customers. Cognitive interviews were also used to pre-test the questionnaire to ensure that customers understood the questions.

The study also combined the research data with actual network data on customer usage and outage probabilities to calculate an AusNet specific value of customer reliability, suitable for use in network planning decisions. The key outcome of the study is that an AusNet specific VCR of **$52.42** per kWh for residential customers is far greater than the AER's 2023 VCR of **$25.13** per kWh and similar to the AER's 2024 VCR of **$49.23** per kWh.

Another part of the QCV study relates to customers' willingness-to-pay (**WTP**) for other service level outcomes. We asked customers how much they would be willing to pay for the following:

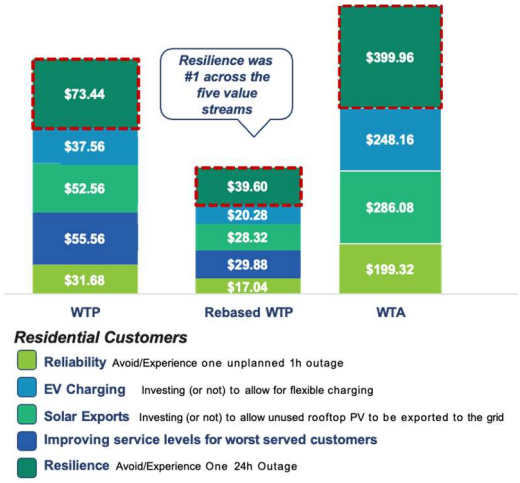
- Reliability – avoid/experience one unplanned 1hour outage
- EC charging – investing (or not) to allow for flexible charging
- Solar exports - investing (or not) to allow unused rooftop PV to be exported to the grid
- Improving service levels for worst served customers
- Resilience – avoid/experience one 24hour outage

QCV estimated of the value that customers place on each stream by using the following estimation methods:

- Willingness to pay (**WTP**), which is the maximum amount a customer is willing to pay for a service. This can vary based on factors such as income, preferences, perceived benefits, and market conditions.
- Rebased WTP, which is the maximum amount a customer is willing to pay for a service determined by their willingness to pay for the entire bundle of services.
- Willingness to accept (**WTA**), which is the minimum compensation a customer would accept to lose a service. It depends on various factors such as the individual's valuation of the item, opportunity costs, and personal circumstances.

Figure 7 shows the value that customers place on each of the five streams using the different valuation methods. A key finding from this analysis is that resilience has the highest priority in terms of value compared to the other service components. The rebased WTP for resilience – to avoid one 24hour outage – is **$39.6** per residential customer per annum. The equivalent value for business customers is **$178.68** per business customer per annum. The bill impacts of our resilience program are below the rebased WTP values.

Figure 7: Estimating the value that customers place on resilience



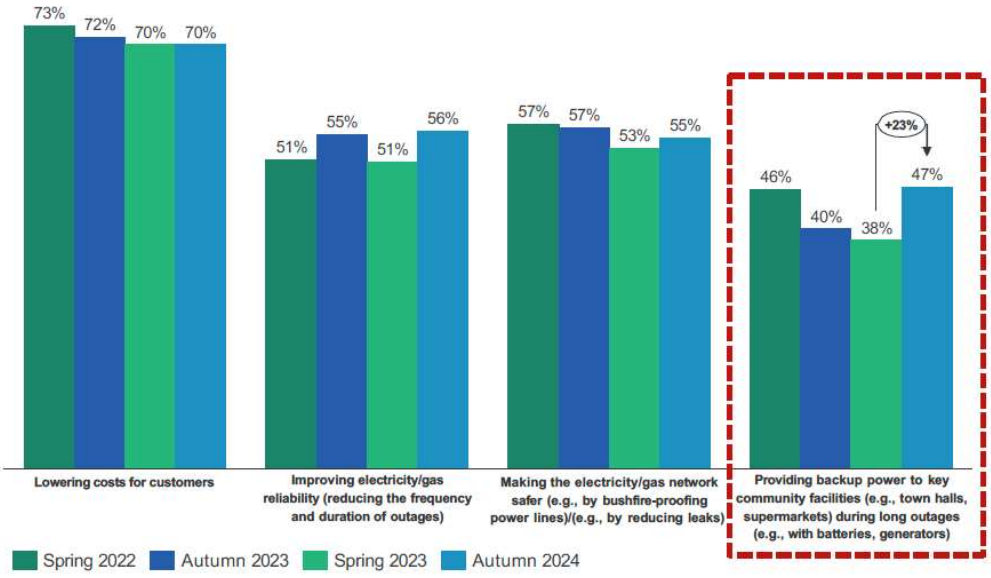
Source: AusNet.

The results validated findings from other sources of research and customer engagement, which is that customers are both concerned about cost-of-living pressures and place the highest value on resilience. However, beyond the validation of existing themes, the QCV research has highlighted that:

- Both households and businesses placed a higher value on avoiding long outages than any other of the quantified streams.
- Electricity needs to be affordable, but customers want value. While customers are concerned about affordability but still see the value of investment in the network.

In addition to the QCV research, we have also undertaken research with customers to understand how their attitudes to different service aspects are changing over time. Figure 8 shows that our customers are placing increasing importance on resilience, with a 23% increase between spring 2023 and Autumn 2024. AusNet also notes that affordability remains an on-going concern for our customers, which is a point highlighted by our Electricity Availability Panel, which we discuss next. As a consequence, it is essential that we balance our resilience expenditure with the need to keep costs to customers as low as practicable.

Figure 8: The importance of resilience for our customers is increasing



Source: AusNet.

5.3. Electricity Availability Panel

Our Electricity Availability Panel provided expertise to help us better understand our customers' preferences regarding network reliability, resilience and availability, and ensure our investment plans appropriately balance affordability and reliability. In contrast to the customer research and survey work discussed thus far, the Electricity Availability Panel provided an opportunity for in-depth discussion on the different expenditure options to improve resilience in the context of the Panel's practical understanding of how customers are affected by storm events.

The scope of our engagement with the Electricity Availability Panel has included the following meetings:

- March 2023 - Meeting #1: The panel discussed AusNet's Engagement Framework and introductions to reliability and resilience.
- May 2023 - Meeting #2: The panel discussed AusNet's plan for managing extreme weather events, regulatory requirements and reliability improvements for worst served customers.
- August 2023 - Meeting #3: The panel discussed criteria for worst served customers and other considerations (e.g., assessing willingness to pay for upgrades and cost benefit assessment framework).
- September 2023 - Meeting #4: The panel discussed managing customer reliability outcomes and how customer preferences fits into investment planning.
- October 2023 - Joint Availability & Customer Experience Meeting #5: The panels discussed how might AusNet best plan its work to minimise adverse impacts of outages on customers.
- December 2023 - Meeting #6: The panel discussed managing power quality, including customer preferences, regulatory obligations and potential improvements to power quality that could be considered for the 2026-31 regulatory period.

- February 2024 – Meeting #7: AusNet provided updates on current availability issues and played back answers to the Panel's focus questions.
- July 2024 – Meeting #8: The panel discussed and provided feedback on our resilience expenditure program
- July 2024 – Meeting #9: The panel discussed and provided feedback on our reliability improvement program
- August 2024 – An all-panel offsite where Panels discussed and provided feedback to our overall expenditure plans.

We have held a series of customer workshops (face-to-face and online) between August 2023 and October 2024 to assist us in better understanding resilience from the perspective of our customers and their communities. A number of important themes emerged from the engagement with our Electricity Availability Panel, which are summarised below:

- There is an overwhelming case for a resilience strategy which seeks to improve customer outcomes. In developing this strategy, customers expect us to consider the multi-faceted nature of resilience, including the importance of ensuring that efforts by other essential service providers are coordinated to deliver the best outcome for customers.
- Affordability remains an important consideration for customers, which places the onus on AusNet to demonstrate that customers are not 'paying twice' for resilience including, for example, by duplicating effort with other service providers and clarifying roles and responsibilities. For example, providing backup supply to telecommunication service providers should perhaps be an obligation on those service providers, rather than AusNet.
- Community hubs are important in supporting communities and facilitating greater resilience. While AusNet may have a role in enabling community hubs, it is important that any efforts are tailored to meet the specific needs of each community which will vary significantly. There was no support, for example, for AusNet community hubs, developed in isolation from other emergency support facilities.
- The linkages between AusNet's expenditure plans, which includes resilience, reliability to improve the worst performing feeders, must be carefully assessed to ensure that the benefits of the expenditure are not double counted.
- To deliver a more resilient outcome for customers, it is appropriate to consider the full spectrum of potential activities from prevention through to restoration. As part of this consideration, AusNet should also consider the efforts that customers themselves can make to improve their resilience, and to leverage these efforts where possible.
- Communication is a key element in ameliorating the impacts of a storm event. Maintaining communications, including telecommunications, is essential. The provision of timely and accurate information to customers regarding restoration times is also of considerable value.
- It is important to consider resilience from the perspective of communities, rather than individual customers. This may have implications for how AusNet prioritises the restoration of power, particularly given the need to provide community hubs and maintain essential services.
- Standard 'cost-benefit' analysis of the kind that applies to traditional network investments may not be appropriate in developing AusNet's resilience expenditure plans. For example, there is a strong case for improving the performance of the worst performing feeders (which will also provide a more resilient network) from an equity perspective.

6. Framework to optimise resilience expenditure

As explained in section 4.3, the regulatory framework is likely to be modified by changes proposed by the Victorian Government through the Network Resilience and Network Outage Reviews and the AER's decisions on VNR and 2024 VCRs. While the regulatory framework is continuing to evolve, we recognise the importance of establishing frameworks to guide our resilience expenditure.

Having regard to the customer research and engagement described in the previous section, there are two frameworks that we have found particularly helpful to ensure that we optimise our plans in a way that delivers the maximum value to our customers:

- **Customer experience**. This framework links resilience initiatives to the three pillars of customer experience; and
- **Balanced response**. This framework ensure that our initiatives are balanced between those that are focused on 'prevent and prepare' and those that focus on 'respond and recover' initiatives.

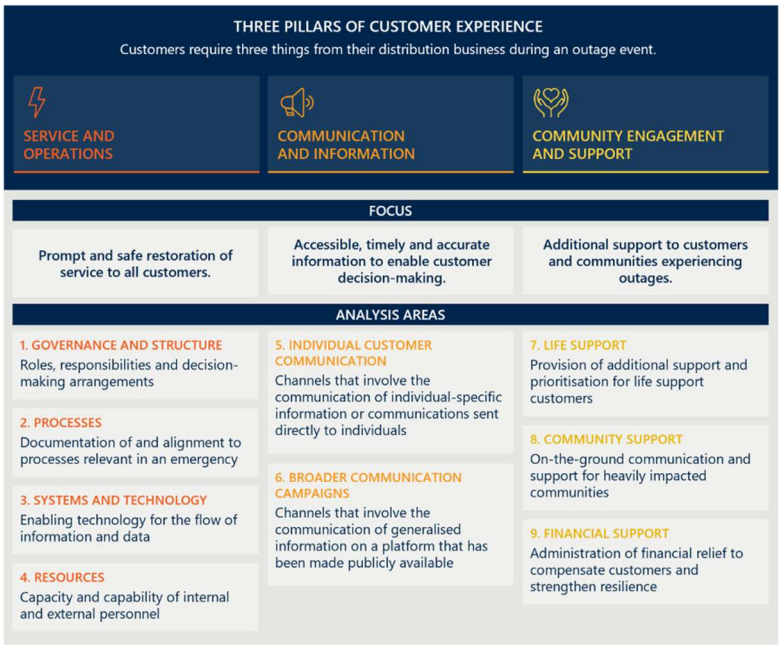
6.1. Customer experience

The Nous Group identified three pillars that capture customer experience in relation to resilience:

- Service and operations – Customers expect a distribution business to take all necessary steps to identify the cause of a fault and undertake work that restores power to their home, business, or community quickly.
- Communication and information – Customers expect access to timely and accurate information about the outage they are experiencing, including estimated restoration times. Communication from or information made available by a distribution business should enable customers to make informed decisions about how to prepare for and respond to the event.
- Community engagement and support – Customers want to be able access services that mitigate their negative experience of an outage event. This includes a wide range of immediate or retrospective support beyond the restoration of power.

The figure below is reproduced from the report from Nous Group, which shows how different types of resilience initiatives are linked to these three pillars of customer service. By adopting resilience solutions across each pillar, we ensure that we address all aspects of our customers' needs.

Figure 9: Customer experience framework



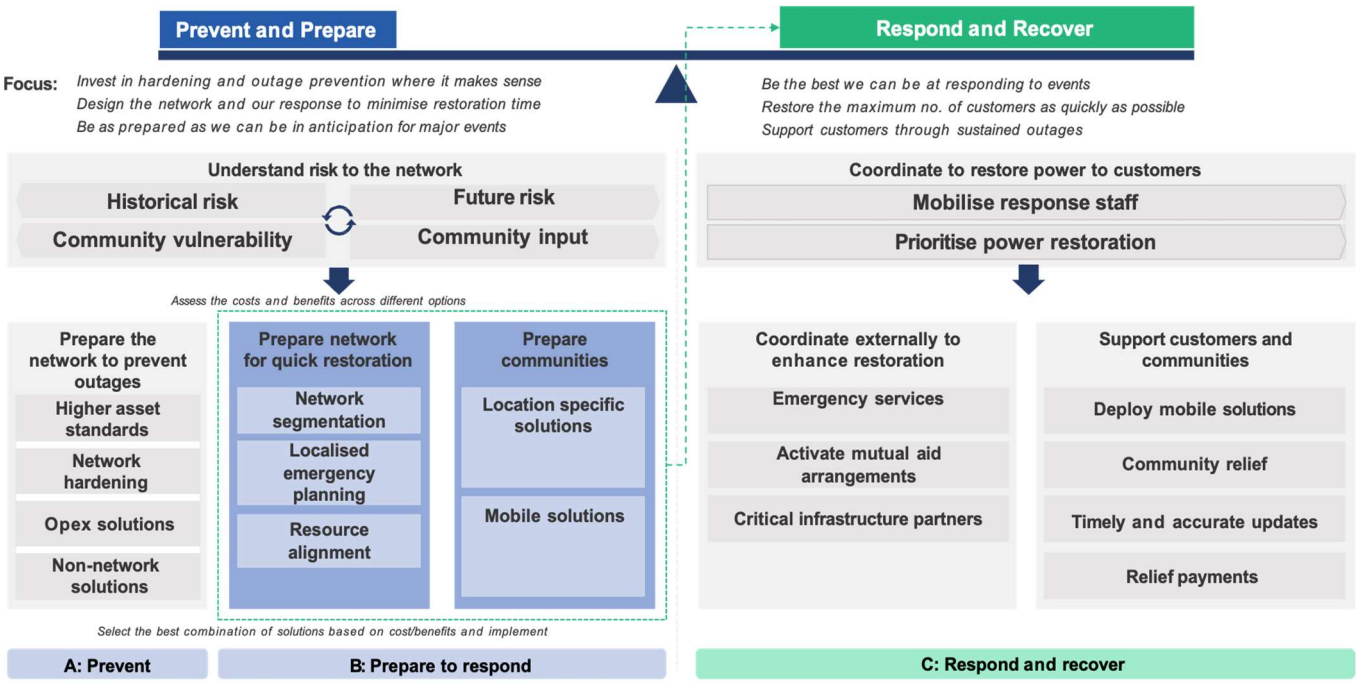
6.2. Balanced response

The balanced response framework is illustrated in Figure 10 below, which shows how potential resilience expenditure needs to be balanced between 'prevent and prepare' and 'respond and recover' initiatives in a coordinated manner to deliver the best outcome for customers. Both approaches are essential because it is not possible to prevent all outages and therefore fully displace the need for response and recovery and conversely, allow for unrestricted growth in outages and divert all resources to response and recovery.

The figure below shows the interaction between 'prevent and prepare' and 'respond and recover' where some of the key considerations into the right balance are:

- Where network or non-network solutions are economically sound (NPV positive) to address high risk areas (based on historical and future risks) then network or non-network solutions should take priority over the respond and recover approach.
- Network hardening solutions should be implemented where it is economic (NPV positive) to do so. Some non-network solutions (e.g., backup power for community hubs) are important supplementary measures and not mutually exclusive.
- SAPS are relatively expensive and therefore only expected to be most cost effective to install at the time when the existing service line is due for replacement. It is also most cost effective in rural and remote areas where the alternative (e.g. augmentation) is very expensive. This means we should be analysing NMI level data to identify customers being served by aging assets, with high susceptibility to outages, in rural and remote areas with high vulnerability.
- The risk of outages will always exist, so we should always have a suite of mobile generators and emergency vehicles that can be rapidly deployed. The right level of mobile generators and emergency vehicles should be informed by our historical experience and forecast need.
- Our existing hazard tree program is prioritised to target the highest risk hazard trees first. While expanding the hazard tree program would allow a larger scope of works, including commencing work on trees that are lower in priority, yet nevertheless important to address to avoid tree falls onto powerlines, this would be limited by amenity concerns. Our Revenue Proposal forecast reflects our best forecast at this stage.

Figure 10: Balancing initiatives to improve network resilience



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