



January 2023

# Promoting the long-term interests of consumers in a changing climate: A decision-making framework

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Empowering communities for a resilient  
affordable and net-zero future.

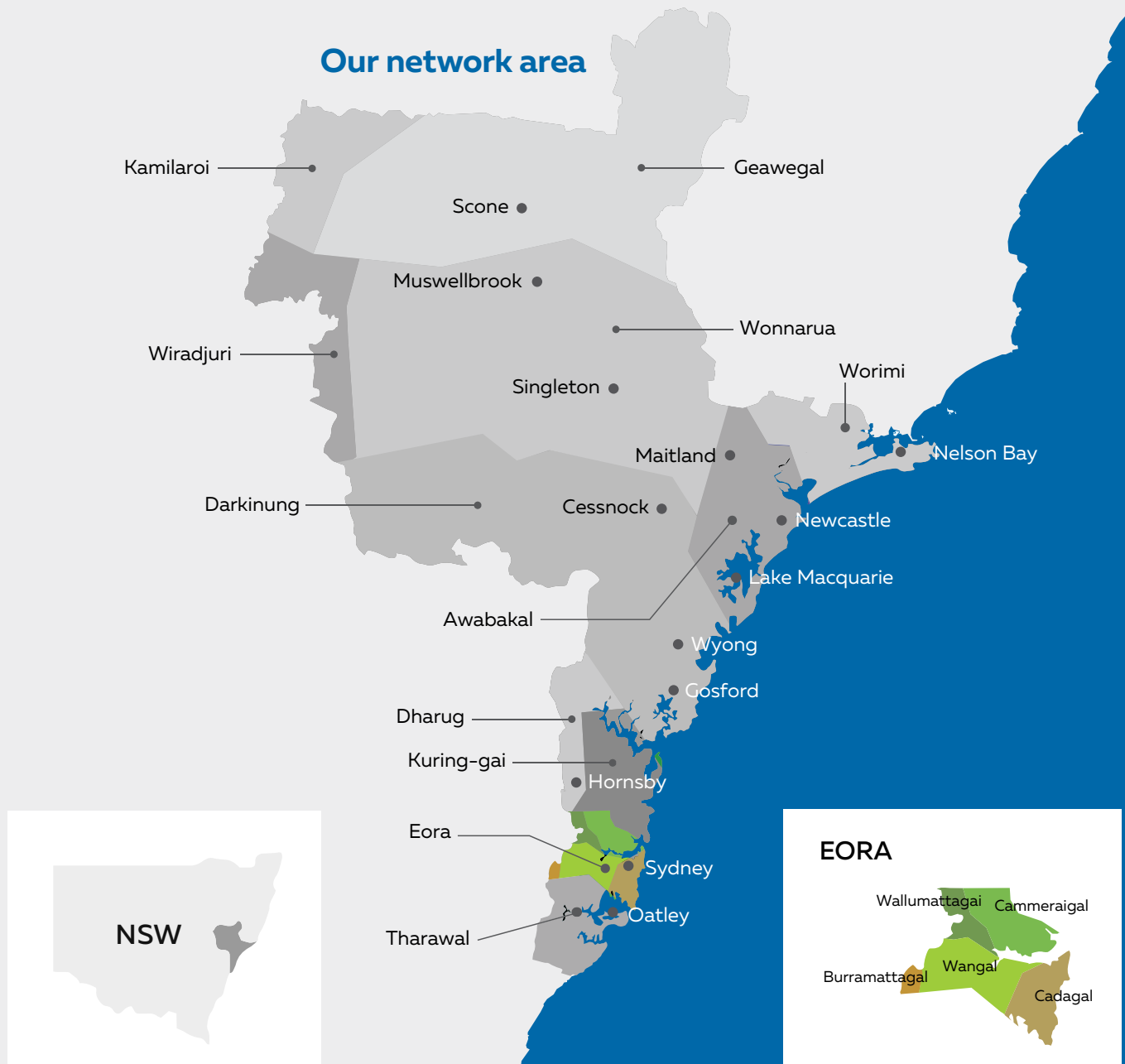


# Acknowledgment of Country

We acknowledge the Traditional Custodians of the lands where the Ausgrid distribution network is located, and we pay our respects to the elders past, present and emerging.

As set out in our Reconciliation Action Plan, it is important that this recognition leads to industry wide support and understanding of the knowledge, stories, languages and experiences of Aboriginal and Torres Strait Islander peoples, as our way of paying respect, and contributing to, some of the oldest continuous cultures of the world.

Our network and operations span the traditional country of 17 languages, tribal and nation groups in Sydney, the Central Coast and Hunter regions of New South Wales. We want to lead and foster a workforce, and approach to our operations, that embraces the learnings, voices, cultures and histories of these Traditional Owners into our own organisation.



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# Foreword

Ausgrid and the Reset Customer Panel (RCP) are very pleased to support the release of this co-designed document, *Promoting the long-term interests of consumers in a changing climate: A decision-making framework* (the Framework). We also thank the Total Environmental Centre (TEC) for their invaluable support and input into the development of the Framework.

We are all aware of the changes in the climate and the impact from more frequent and severe weather events including bushfires, floods and storms. The impacts and losses from these events continue to be felt across communities. These changing weather events, along with the increasing dependence on electricity in our community, requires all of us – Ausgrid and all in our community – to carefully consider how we respond.

This Framework takes a forward-looking longer-term perspective to responding to these risks and it is intended that the Framework will adapt over time. The Framework is intended to give confidence to the Australian Energy Regulator (AER), Ausgrid's customers, employees, and shareholders in our approach to managing a changing climate.

It is difficult to be fully confident about where and when these extreme weather events will occur. Ausgrid's designs and operational practices reflect the changing needs and risks of its network. However, in the aftermath of major climate events Ausgrid generally takes a reactive approach, responding as quickly as we can during an event to keep our communities safe and then afterwards to rebuild Ausgrid's network as quickly as we can.

Many of Ausgrid's customers, communities and governments are starting to ask if there is a different approach. In the most recent discussions with customers Ausgrid has been consistently urged to do more in advance to try to reduce the impact of these severe weather events on the Ausgrid network.

We also see that a more resilient community will take more than just making Ausgrid and other energy networks more robust. Emerging energy storage technologies may have a role to play. Ausgrid has started working closely with other distributors, suppliers of essential services, local Councils and with other organisations that are focussing on long term planning, and disaster planning and management. Customers also play a vital role in managing the impacts of extreme weather, both before and after the event.

This year Ausgrid has undertaken our first climate impact assessment, which models the impact of extreme weather events on the performance of Ausgrid's network. As the modelling continues to evolve, we expect to learn more about the localised impacts of climate change.

Our Network Innovation Advisory Committee (NIAC) is well-positioned to oversee trials, innovation and research to make sure that the investments Ausgrid makes will maximise benefits to future customers. Community engagement is a key focus. It is also critical that Ausgrid has a line of sight to changing community expectations and Ausgrid is committed to ongoing deep consultation post an event to understand what worked, what didn't work and how there can be continuous improvement in Ausgrid's responses.

The AER has recently issued a helpful guidance note on how it will assess resilience-related funding. The guidance note has been welcomed by customers and networks alike. This Framework reflects the AER's guidance.

This Framework is forward-looking and will adapt over time. It is a living model that will evolve alongside the advances in climate modelling and innovative ways to address network resilience. Ausgrid and the RCP are sure that the adoption of this Framework will promote the long-term interests of consumers in the face of increasing climate change risk. We are very grateful for your feedback.



Richard Gross  
**Ausgrid CEO**

A handwritten signature in black ink, appearing to read 'Richard Gross'.



Tony Robinson  
**RCP Chair**

A handwritten signature in black ink, appearing to read 'Tony Robinson'.

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# About the RCP

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The RCP was established by Ausgrid in June 2021 to provide independent, customer-focussed challenge to Ausgrid as it develops its 2024–29 regulatory proposal and investment forecasts. The RCP has 6 members formed from Ausgrid’s Customer Consultative Committee (CCC), and an independent Chair. The RCP has worked with Ausgrid to deeply consider how the Framework promotes the long-term interests of customers. For more information on the RCP see Ausgrid’s website:

<https://yoursay.ausgrid.com.au/page/who's-listening>





# Executive Summary

## Why do we need this Framework?

Climate change is causing more frequent severe weather events. These events are causing profound loss and inconvenience to communities, especially during prolonged power outages.

Ausgrid's customers, stakeholders and governments are urging Ausgrid to review its plans and network designs and operations to consider steps it can take to maintain network performance and network resilience and to reduce the impact of damage to its network assets and minimise the duration of outages in the face of these increasing events.

Working out the best way to prepare for and respond to these severe weather events is challenging as it is difficult to be confident about where and when these events will occur. There is a real risk that Ausgrid's efforts might be ineffective or focussed in the wrong geographic locations leading to overcapitalisation of its network.

This Framework takes a forward-looking longer-term perspective to responding to these risks and it is intended that the Framework will adapt over time. It is evidence based relying on the most current climate modelling and evidence that the increased risk in severe weather

events will cause increased damage to Ausgrid's assets. Customers are central to the formulation of Ausgrid's responses and options. Ausgrid will partner with the most at risk communities to ensure that they are also preparing for and investing in community resilience so that the burden of the increased risk does not fall solely on Ausgrid. Innovation and learning from trials of new technology are a key feature.

The Framework builds on the AER's 2022 Resilience Guidance note and is intended to provide the AER, stakeholders and Ausgrid's customers with confidence that Ausgrid's actions and responses to severe weather events are prudent, avoids gold-plating, and are both appropriate and fair to today's customers as well as future generations.

## What the Framework does not cover

The Framework works within the current regulatory framework including the AER's definition of network resilience. The Framework acknowledges the need for wide area long duration outage (WALDO) value, but does not seek to resolve this. Serious threats to network resilience and network performance from cyber-attacks and pandemics are excluded from the Framework.

## How should this framework be used?

Ausgrid will use this Framework to establish a longer-term basis for developing and justifying non-network and network investment decisions focussed on solutions to maintain network performance in the face of severe weather events. It is intended to assist with identifying the most appropriate mix of resilience solutions (including innovation) for the 2024-29 regulatory reset.

## Overview of the process under the Framework

Key features of the process are:

- building a knowledge base and taking a longer-term view on the uncertainty of the localised impacts on Ausgrid's network from climate change;
- acknowledging the developing maturity of climate modelling and the need to keep investing in this modelling;
- using Ausgrid's recent experience with extreme weather events and prolonged outages when establishing the base case;
- acknowledging that the development of community resilience is a shared responsibility and seeking boundaries on Ausgrid's role;
- embedding commitments to community engagement as resilience plans are developed;
- requiring evidence of benefits or trials and pilots of innovative solutions; and
- balancing preparatory and responsive investments to ensure intergenerational equity including the affordability concerns of Ausgrid's customers today.



## Climate impact assessment

Ausgrid will invest in updated climate risk modelling as the basis for resilience funding in each regulatory period to ensure as accurate a knowledge base as possible. In 2024-29 Ausgrid's climate impact assessment will indicate which low, medium or high RCP emissions target it is using as the basis for its impact assessment. The Framework requires that climate impact assessments will be transparent about the confidence of scientists in the modelling projections for future impact of weather events. These forward-looking 25 year base cases will be updated in each subsequent regulatory period with refreshed climate modelling.

## What options are there to respond to the problem?

The Framework identifies key decision-making criteria to ensure that a full range of options are identified to respond to increased risk including partnering and co-funding, community education, technology innovation, relying on the pass through mechanism to build back better as well as network investments. A critical safeguard is that Ausgrid must demonstrate a causal relationship between the proposed resilience expenditure and a reduction in impacts from the increase in extreme weather events which would otherwise be expected. Options selected should be the credible least whole-of-life cost option(s) that promote the maintenance of service levels. Finally, there must be customer support for the options, including from the impacted communities, as well as a demonstrated willingness to pay from all customers.

## Building and optimising a resilience portfolio for the 2024-29 regulatory reset

The Framework outlines the steps that Ausgrid will follow to prioritise and optimise the resilience program into a portfolio that is integrated with other planned work as part of the 2024-29 regulatory reset. Ausgrid will engage with the community on the prioritisation principles for its resilience programs and ensure that the portfolio meets customers' expectations and willingness to pay.

## Community engagement

Community engagement and consultation is a key focus of the Framework. Ausgrid has committed to best practice community engagement to ensure that customers' expectations around network, local community and individual resilience can be understood and met. Potential pathways and partnerships will be explored with the community to ensure that customers are informed about the different resilience expenditure options and help to shape those initiatives.

## Additional accountability requirements

Ausgrid will maintain its existing investment governance framework for all resilience expenditure during the 2024–29 regulatory period, recognising resilience is not a stand-alone item in Ausgrid’s regulatory activity. However, there will be an additional accountability check for all resilience related expenditure commitments made by Ausgrid as part of its 2024–29 proposal. This requirement incorporates the role of NIAC, and its oversight of innovation, research, trials and pilots as well as oversight of business as usual (BAU) resilience activities that would fall into BAU investment programs.

## How will success be measured?

Ausgrid will engage with the broader community on appropriate measures of success for this Framework. Measures of success will include a range of lead and lag metrics incorporating:

- stakeholder satisfaction and customer engagement outcomes;
- community preparedness; and
- network performance.

## Reviewing the Framework and resilience decision making

As this Framework will be supporting new types of expenditure with long term implications, Ausgrid will do a full post implementation review (PIR) with its CCC to review the effectiveness of the Framework, resilience decision making, community satisfaction of the portfolio and effectiveness of any resilience investments.

## Next steps for the Framework

This Framework reflects the feedback received during consultation and Ausgrid and the RCP have co-designed a plan to support the implementation and preparation of Ausgrid’s proposed 2025–2029 expenditure. This Implementation Plan includes local community engagement on the design of the proposed program.







# Framework Philosophy

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Ausgrid is the largest distributor of electricity on Australia's east coast, providing power to 1.8 million customers. The Ausgrid network is made up of substations, powerlines, underground cables and power poles, spanning 22,275 square kilometres in Sydney, the Central Coast and the Hunter Valley.

Ausgrid's vision is for communities to have the power in a resilient, affordable, net-zero future<sup>1</sup> and there is evidence to link an increase in frequency and intensity of extreme weather and natural hazard events, including heatwaves and storms, to anthropogenic climate change.<sup>2</sup> The effects of climate change have prompted communities, organisations, and government to look at building resilience.

Access to affordable, reliable and sustainable electricity is fundamental to the health, well-being and economic prosperity of the community. It is important that Ausgrid, as an essential service provider, considers how best to promote the long-term interests of consumers in response to the increasing risk of localised impacts from climate change on its network performance.

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<sup>1</sup> <https://www.giss.nasa.gov/research/news/20170118/>

<sup>2</sup> <https://www.carbonbrief.org/mapped-how-climate-change-affects-extreme-weather-around-the-world>

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## 1.1 Context and reasoning of approach

The Framework was co-designed by Ausgrid and the RCP as part of Ausgrid's stakeholder engagement on its 2024-29 revenue proposal. Ausgrid established the RCP in June 2021 to provide independent in-depth challenge throughout the 2024-29 Regulatory Reset process. The RCP seeks to represent the long-term perspectives of Ausgrid's customers and help ensure customer views are reflected within Ausgrid's 2024-29 Regulatory Proposal.

The Framework was developed in response to:

- Ausgrid indicating to the RCP and its customers its intention to include claims for expenditure for resilience in its 2024-29 revenue proposal;
- 6 distribution network service providers (DNSPs) (led by Ausgrid) publishing a joint consultation paper on 27 January 2022: [Network Resilience: Resilient communities powered by resilient grids collaboration paper 2022](#);
- 'resilience' of the electricity network being raised as a key topic in Ausgrid's customer engagement, with a focus on fairness and the need to employ a range of solutions (Voice of Community Panel (VoC) and in large customer interviews);
- increased focus of the NSW Government on disaster management and disaster recovery through initiatives such as the establishment of Resilience NSW and the recent appointment of the NSW Minister for Emergency Services and Resilience; and
- the Australian Energy Regulator's (AER) recent publication [Network resilience: A note on key issues](#) (AER guidance note) and in particular **section 3**, Assessing resilience funding and expected evidence to support ex-ante resilience-related funding.

## 1.2 The Framework's ability to adapt over time

Climate change science began in the early 19<sup>th</sup> century and since the 1990's research has expanded our understanding of causal relations, and links with ability to measure and model climate change. As the years progress, we learn more about the localised impacts of climate change and we become more and more confident in modelled projections. Resilience is something that Ausgrid has always invested in from a network perspective, but adapting to climate change is something that cannot be built over a short period of time and will likely take decades. As evidence-based climate data and confidence levels continue to increase, lessons learned can be applied to future responses by individuals, communities, Ausgrid and other suppliers of essential services.

This Framework is intentionally forward looking, taking a rolling longer-term perspective, and a key feature of this Framework is its ability to adapt over time. The November 2021 AER Information paper '[Regulating gas pipelines under uncertainty](#)' highlights a new flexibility in the AER's approach to responding to uncertain long-term risks within each reset. For example, the AER has explored accelerated depreciation so that future gas network customers, which may be significantly less in number, do not pay too much for the long-term, fixed cost investments that current customers require today. A similar longer-term approach to resilience funding is reflected in this Framework.

## 1.3 Ausgrid's approach to risk management and investment

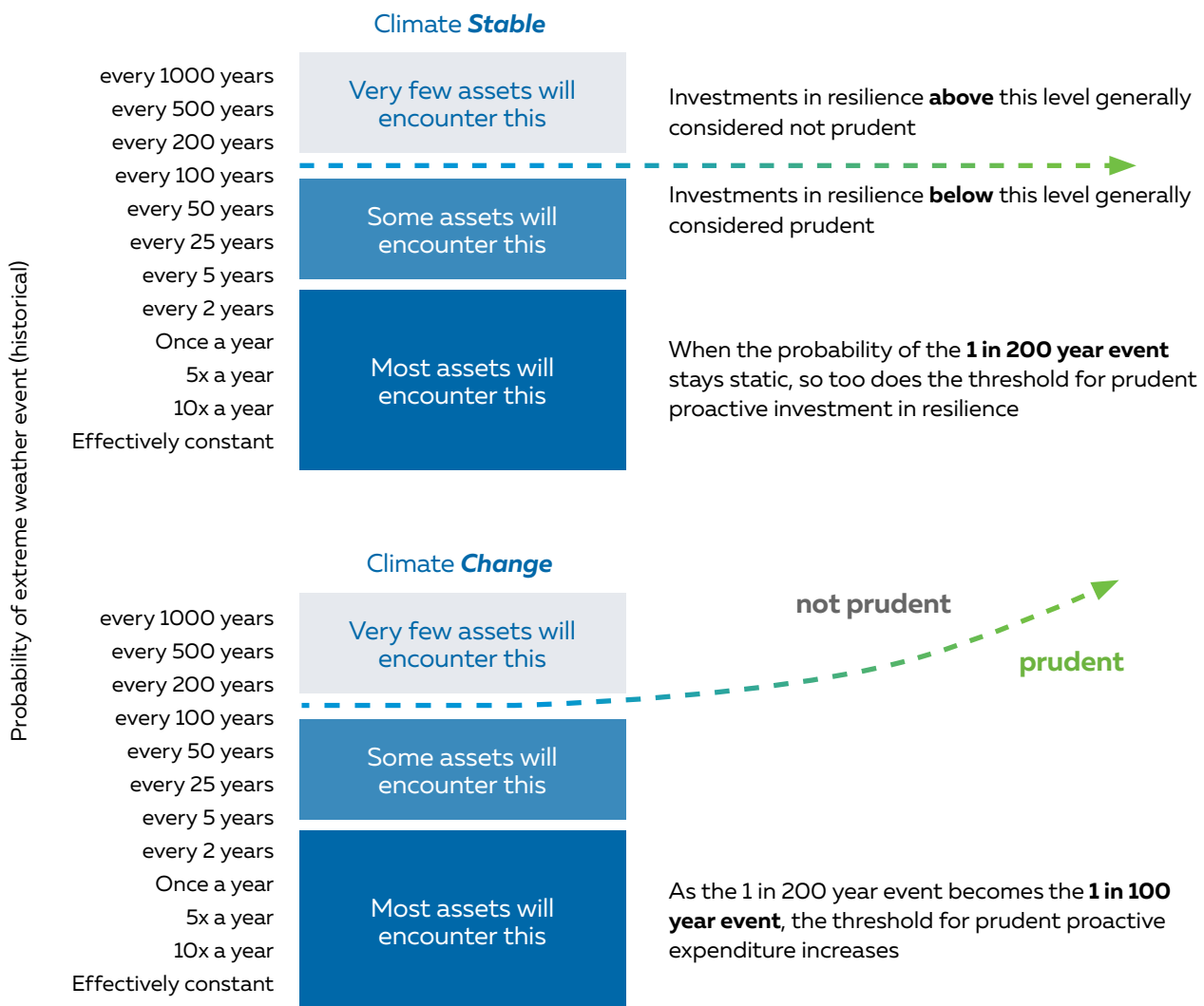
Ausgrid has a risk management framework and approach to how it makes investments. This approach has been informed by relatively stable weather conditions; to date these programs have not considered the impact of a changing climate risk.

Without accounting for climate change impacts when making network investments, there is risk of locking in higher costs and greater risk for the customers being served by that network over its 50-year life. As it stands now, the resilience of the assets that provide our current electricity supply is dictated by the decisions and design principles adopted by those that built the network at the time of installation. Likewise, those people being supplied by the electricity network in 2065 will be living with the risk and cost implications of the investment decisions we make today. It is therefore critical that electricity networks, and regulatory authorities, consider how our climate might change over the next 40-50 years, not just the next 5-10 years.

Acknowledging that the past is no longer a predictor of the future, Ausgrid's hypothesis was that a changing climate meant that the threshold separating prudent from non-prudent investment would shift. In FY 22 Ausgrid has undertaken its first Climate Impact Assessment, which aims to take an evidence-based approach to the forecasting of the impacts of localised risks from a change in extreme weather events on the performance of Ausgrid's network. This work is considered the first of its kind by a distribution network in Australia, and as climate data and modelling of impacts to the grid continues to improve, this work will need to be updated on a semi-regular basis. Ongoing investment by Ausgrid in the climate impact assessment (and climate modelling) is a critical underpinning to this Framework. The illustrative example describes the hypothesis.

**Figure 1: Investment needs are evolving with a changing climate**

**Hypothesis:** a changing climate means the threshold beyond which investment in resilience is no longer economic is shifting



## 1.4 Ausgrid’s commitment to understanding consumers and partnering when needed

Ausgrid is committed to providing the best outcome for its customers, including future generations. The Framework includes a commitment from Ausgrid for appropriate community engagement so it can understand the specific needs of the different communities that are supported by the Ausgrid network. Ausgrid and the RCP recognise that solutions that work in Sydney, may not work in Cessnock and vice versa.

Ausgrid has also committed to partnering and has commenced a robust engagement program with other resilience actors and providers of essential services. Resilience is a shared responsibility and cannot become the sole responsibility of Ausgrid. Ausgrid is engaging

with partners to better understand where its role starts and stops within the resilience discussion. Under this Framework before Ausgrid looks to provide resilience related investments or support to a community (investments), Ausgrid will:

- look for partnership opportunities;
- support communities to develop their own local resilience plans; and
- work collaboratively with local communities on the design of community responses and any investments Ausgrid is intending.

## 1.5 Intergenerational equity

Intergenerational equity aims to address fairness between current and future generations. There is an important balance that the Framework seeks to achieve by balancing the long-term risk for different groups of customers from underinvestment and overinvestment (including cost recovery under the cost pass through mechanism). Under this Framework before Ausgrid looks to provide investment or support to a local community, Ausgrid will:

- implement resilience programs and/or capital solutions when they are the least whole-of-life cost, credible solution to an identified risk;
- where the benefits of a proposed investment are uncertain, trial and pilot different types of support prior to rolling them out;
- prioritise solution(s) that provide the overall biggest net benefit; and
- engage with customers to establish that they are willing to pay for investments to address potential impacts in localised areas.

The Framework promotes finding the right balance in timing for investment as well as the right balance between preparatory investment and responsive investment via the cost pass through mechanism by focussing on:

- the highest risk geographic areas from climate modelling; and
- trials and a staged roll out of new solutions, where there is a high level of uncertainty of the effectiveness of an available option.

This approach will go some way to addressing intergenerational equity, by increasing the probability that investment decisions today will not result in future generations paying materially more than they need to. However, as the cost of inaction is often more than the cost of early action, the greatest risk to future generations may be in doing nothing. Investment in resilience does not mean that there won't be future power outages, however, the resilience work intends to better prepare both the network and communities for events to help them recover more quickly.





# Why do we need this Framework?

## 2.1 What is the problem?

Changes in our climate are leading to more frequent severe weather events. The impacts from these severe weather events profoundly affect communities, including causing great inconvenience during prolonged power outages when Ausgrid's network is severely damaged. These changing weather events, along with the increasing dependence on electricity in our community, requires all of us – Ausgrid and all in our community – to consider how we should collectively respond to these shifts in environmental risks.

Working out the best way to prepare for and respond to these severe weather events is challenging as it is difficult to be confident about where and when these events will occur. Whilst Ausgrid's network designs and operational practices reflect the changing needs and risks of its network, in storms and fires Ausgrid generally takes a reactive approach, responding as quickly as it can during an event to keep communities safe and afterwards to rebuild the network as quickly as possible.

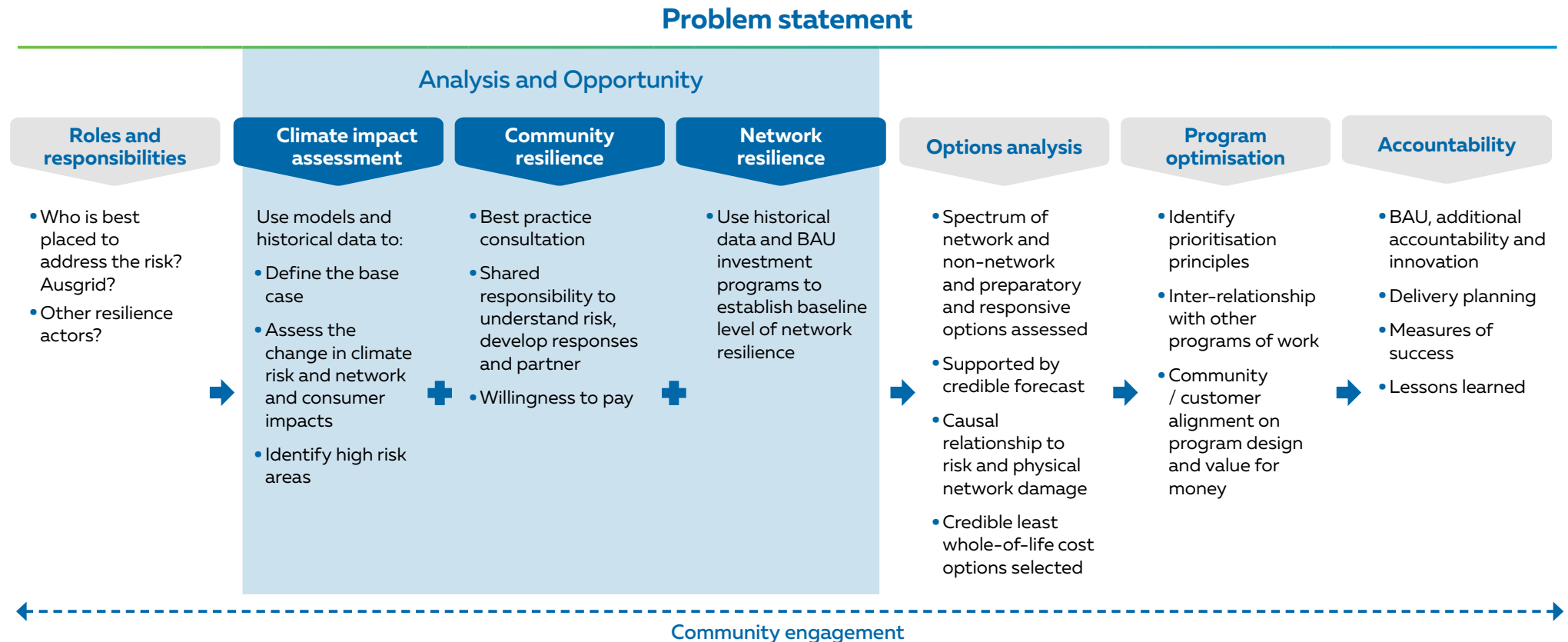
Currently there is no agreed plan on how Ausgrid should work with others to prepare, plan and recover from these severe weather events. It is unclear what Ausgrid's responsibility is to support community resilience over and above its role in maintaining network performance and network resilience. Further, there is no agreed framework for what Ausgrid should do to avoid or withstand these severe weather events, minimise their scope, severity and duration or assess the most efficient means; while doing so in an environment where these impacts are likely to be more frequent.

Ausgrid considers 'resilience' to be the correct framing for addressing this problem. This Framework aims to build confidence that Ausgrid's actions and responses to climate change adaptation, including its resilience related decision making, are prudent, appropriate and fair to customers today and in the future. **Figure 2** is a summary of how this Framework will respond to the problem.

Figure 2: Summary of resilience Framework

# How does this Framework respond to the problem?

A visual process flow of how the Framework will be used by Ausgrid in any future resilience related decisions is set out here:



- Preparation**
- Willingness to pay
  - Identification of at risk communities
  - Options identification
  - Implementation
  - During event
  - Post event



# Definition of Resilience

The concept of resilience is not new. For an electricity network business, resilience is a feature of prudent energy system planning. Ausgrid already makes investments to support the resilience of its network and the reliability of supply.

However, thanks to climate and cybersecurity risks, network resilience is becoming an increasingly important issue. Although resilience is not explicitly defined or referred to in the National Electricity Rules (NER), the AER and this Framework regards resilience as an input that contributes to achieving a high standard of reliability and safety – the service level outcomes.

In the AER Guidance Note, network resilience is defined as:

*“ a performance characteristic of a network and its supporting systems (e.g. emergency response processes, etc.) It is the network’s ability to continue to adequately provide network services and recover those services when subjected to disruptive events.”*

Ausgrid and the RCP understand the AER’s definition to mean:

## **Adequately provide**

Build our capability to adapt, withstand and resist impacts or avoid network destruction by absorbing and minimising disruptions

## **Network services**

Capability to provide network services to customers and additional relevant support to communities

## **Recover**

Ensuring plans and processes provide energy supply restoration and support to communities as quickly as possible

## **Disruptive events**

Major hazard or chronic risk such as extreme weather events, cyber-attacks, pandemics, unknown unknowns etc.

Earlier this year, Ausgrid and five other DNSPs proposed a definition of resilience<sup>3</sup> which differs from that proposed by the AER, but which is consistent with the definition used by Resilience NSW. The main difference between the two is that the latter includes the term “transform”. In other words, network resilience is not only about “bouncing back” to the status quo. In the context of climate risk, it includes the prospect of adapting or transforming the system to a “new baseline”, which over time will be significantly different to the status quo. Adapting and transforming may also require networks to respond, both in their planning and at short notice, to an increasingly chaotic external environment.

### 3.1 Regulatory Reform

For the purposes of this document, Ausgrid is working with the AER’s definition of resilience as interpreted above, while also noting that other, broader definitions may provide further insights—especially when it comes to the role of network resilience in contributing to community resilience.

This Framework has been developed within the existing regulatory framework. However, there are aspects of the regulatory framework that may need to be reviewed in the future to ensure that resilience decision making and investments remain consistent with the lived experience of the network and evolving expectations of customers. Possible areas for review are:

- appropriate metrics for network resilience (e.g., raw system average interruption duration index [SAIDI]);
- how major event days (MEDs) are calculated in the service target performance incentive scheme (STPIS) incentive mechanism;
- how to value customer reliability during outages exceeding 12 hours (i.e. WALDOs); and
- potentially, whether resilience needs to be explicitly defined and recognised in the NER.

### 3.2 Distinguishing between BAU and new investment

BAU investment programs are designed to meet a range of business requirements and service level outcomes including safety and reliability. BAU investments support a baseline level of resilience in the network (e.g. traditional Repex). Ausgrid will distinguish between BAU investments that pre-dated this Framework and new investments designed to address the increase in climate related risk to the network, whether they are extensions of BAU programs or new programs. New investment programs can be both new types of investment (e.g. community support activities), as well as incremental changes or increases to BAU investment programs (e.g. incremental investments in repex beyond traditional).



<sup>3</sup> The ability to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard.



### 3.3 The scope of the Framework

This Framework focuses on physical risks to Ausgrid's network caused by extreme weather events. BAU physical risks are not considered within this Framework as they are part of Ausgrid's other regulatory obligations. This Framework relates to investments to address increased climate related risks above the baseline level of risk.

Other risks to the network that are not physical, such as cyberattacks and pandemics, were not explicitly considered as part of this decision-making Framework. However, in the future there may be scope to agree on approaches to manage other disruptive events.

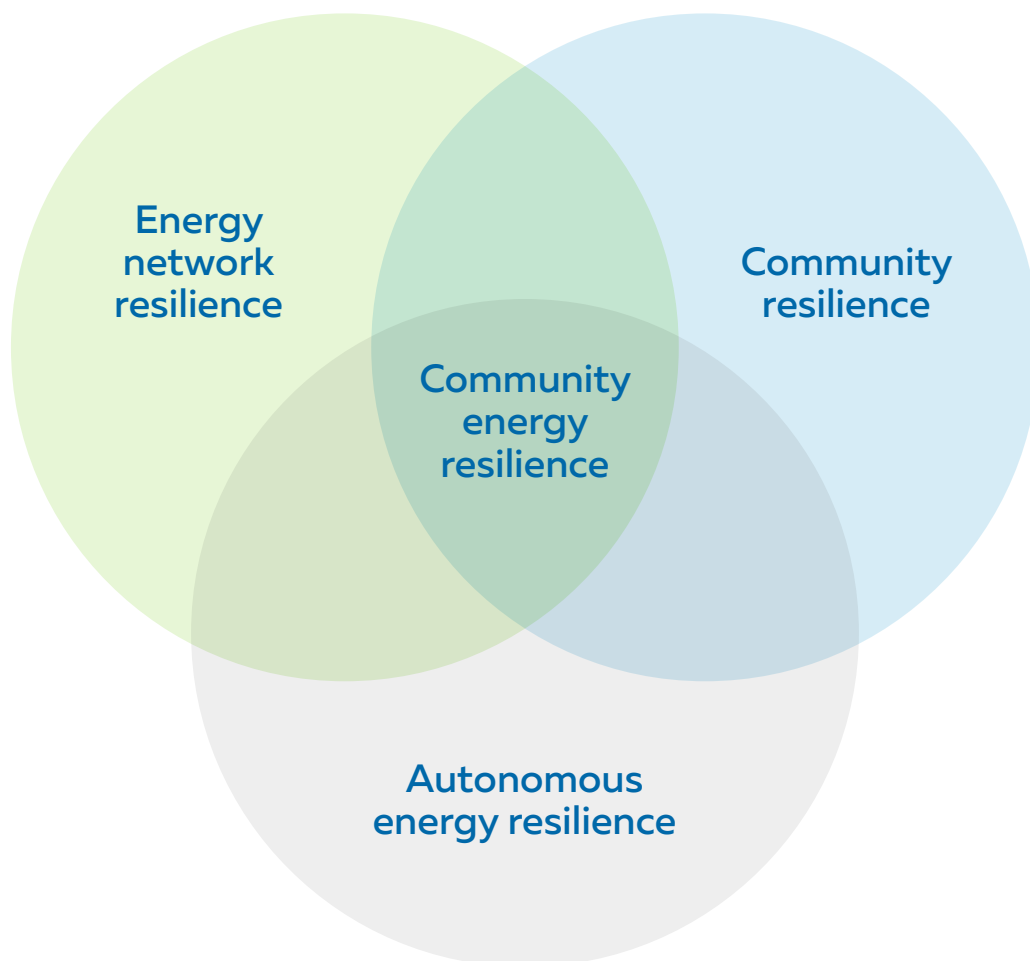
Network resilience is related to, but also distinct from, community resilience. There are aspects of community resilience that cannot be met by networks, and vice versa. For instance, governments, other critical infrastructure

operators and individuals themselves all have roles in supporting community resilience. Some aspects of community resilience are directly related to network resilience, and others Ausgrid can play a supporting role along with other entities, shaped by the local communities needs

Lastly, there is the concept of autonomous resilience, or self-reliance. It concerns what individuals, households and businesses can do to contribute to their own energy resilience. This could include anything from empowering communities to be prepared with the basics like water and non-perishable food, through having backup power supply sources, to going completely off grid.

As **Figure 3** shows, the three dimensions of resilience – network, community and autonomous (or self-) – come together or overlap when all three act together to improve local energy resilience.

**Figure 3: Focusing on the three dimensions of resilience**





# Background to the Framework

## 4.1 How this Framework should be used

This Framework should be used by Ausgrid (and potentially other organisations) as a longer-term approach to planning and resilience decision-making for network, and non-network investment decisions including (but not limited to) network investment, community education, co-funding arrangements and the testing and staged roll out of innovative technologies associated with the incremental increased risk from climate change.

The intention of this Framework is to help with the current 2024-29 regulatory reset application as well as future reset periods to identify the most appropriate mix of resilience solutions for an area. The Framework will also be reviewed and updated as needed as Ausgrid and the broader industry learns more about adapting to climate change.

## 4.2 How this Framework was developed (co-design)

Climate change is recognised as one of the biggest problems that civilisation will need to manage today and adapt to for future generations to come. As managing this problem is so large, especially when balancing it with other complexities such as affordability and rising inflation, the topic requires significant stakeholder engagement.

This Framework is intended to build upon the guidance of the AER and was developed and co-designed by Ausgrid and the RCP as an opportunity for customers (via representation through the RCP and in subsequent community engagement) to contribute to the creation and development of an approach to resilience decision making and funding from its inception, rather than take on a reactive role. To that end, the RCP and Ausgrid have taken the key matters from the AER Guidance Note as the foundation for this Framework as outlined in **Table 1**.

**Table 1 AER Guidance Note requirement**

<b>AER Guidance Note requirement<sup>4</sup></b>	<b>Section in this Framework where this requirement is addressed</b>
The AER's definition of resilience	<b>Section 3</b>
Resilience funding is within the NER	<b>Section 3</b>
Resilience is a characteristic of a network that directly influences service level outcomes (maintenance of reliability, safety, and security)	<b>Section 3</b>
The optimal balance between ex-post and ex-ante responses needs to evolve	<b>Section 4</b>
Network resilience is part of community resilience	<b>Section 3</b>
Community resilience is a shared responsibility	<b>Section 5</b>
The AER will consider roles and responsibilities	<b>Section 5</b>
The AER expects rigour in networks' justification for expenditure, but recognises the uncertainty for networks to apply this same rigour to resilience expenditure at this stage	<b>Sections 6 – 10</b>
Rigour is also expected in networks' customer consultation	<b>Section 9</b>
Networks need to demonstrate causal relationships (but how this is done needs to be refined)	<b>Section 6</b>
A risk based, geographic approach is needed (to be refined and improved over time)	<b>Section 6</b>
Latitude was given to develop a framework	<b>Section 2</b>
Expenditure on ICT to support climate resilience is endorsed	<b>Section 8</b>
The AER's position on emergency responses and preparatory funding includes network responses during an event as well as before and after	<b>Section 4</b>
The AER is interested to know customers' willingness to pay for proposed expenditure on resilience	<b>Section 9</b>
The AER expects local communities (not just customers) to support and contribute to how resilience planning or expenditure is proposed for their area, as a result of meaningful engagement by networks	<b>Section 9</b>
There is a greater expectation to demonstrate customer preferences in both engagement and modelling	<b>Section 9</b>

<sup>4</sup> AER, *Note on the key issues of network resilience*, April 2022: <https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/aer-note-on-network-resilience/aer-position>

As this Framework was co-designed during its inception, there was genuine discussion, engagement, and feedback between the groups that occurred after several in person workshops. This Framework represents an agreed joint approach to resilience between Ausgrid and the RCP and it outlines a shared understanding of how to take a risk-based approach (see **section 6**) to the development of its resilience programs. Ausgrid consulted on the Framework during 2022 to test the views of its customers, stakeholders, and the AER.

### 4.3 What the Framework achieves

The intention of this Framework is to promote the long-term interests of consumers in the face of increasing climate change risk by building confidence that Ausgrid's actions and responses to climate change adaptation are both prudent and appropriate. Key features of the Framework that are set out in **sections 5-10** of this Framework include:

- building a knowledge base and taking a longer-term view on the uncertainty of the localised impacts on Ausgrid's network from climate change;
- acknowledging the developing maturity of climate modelling and the need to keep investing in this modelling;

- insisting that the development of community resilience is a shared responsibility and seeking boundaries on Ausgrid's role;
- embedding commitments to community engagement as resilience plans are developed;
- requiring evidence of benefits or trials and pilots of innovative solutions;
- balancing preparatory and responsive investments; and
- considering intergenerational equity including the affordability concerns of Ausgrid's customers today.

### 4.4 Assessment by the AER

The AER should have greater confidence that proposals for resilience related funding prepared under this Framework reflect consumer preferences, as they are central to the Framework's decision-making processes. The Framework seeks to give customers and communities significant influence over the development of Ausgrid's resilience responses to ensure Ausgrid is delivering outcomes valued by its customers and communities. The extent to which expenditure forecasts address the concerns of customers and communities is also a factor which is central to the AER's decision making under the NER.<sup>5</sup>



<sup>5</sup> National Electricity Rules, cl. 6.5.6(e)(5A) & 6.5.7(e)(5A)]



# Roles and responsibilities

## 5.1 Roles and responsibilities of all parties included in resilience planning and implementation

As climate change is one of the biggest challenges humanity will have to manage now and into the future, there is an important and increasing focus on the roles and responsibilities of essential service providers like Ausgrid, government at all levels, emergency services and other key resilience actors to build overall resilience within our respective systems and communities. There is an opportunity for Ausgrid to work together with other stakeholders to ensure there is a shared responsibility to build and maintain resilience.

In NSW there are several initiatives that seek to co-ordinate responses when disaster strikes. By contrast, there is minimal pre-planning and minimal long-term coordination in terms of things such as asset investments that may have a service life of 50 years. It is imperative that Ausgrid makes planning decisions in a coordinated fashion that removes the siloed way in which various organisations have been operating (as much as reasonably possible). When thinking about resilience planning and potential investments, there needs to be demonstrated collaboration between Ausgrid and different resilience actors.

The definition of specific roles and responsibilities of players in the resilience's ecosystem is key. Ausgrid recognises that although it is taking a leadership position in the resilience space, it is not solely Ausgrid's role to be considered the "silver bullet" for building a community's resilience. The AER Guidance Note stresses that network resilience is only a portion of a community's resilience, and some responsibility needs to be owned by other resilience actors and the local community itself to develop resilience to extreme weather events. With that, Ausgrid and the RCP recognise that as electrification continues to be embedded into our society through things like communications networks and electric vehicles to our entire financial system, community resilience and network resilience become more strongly linked. A critical step in defining Ausgrid's role is to assess who is best placed to manage responses and support community resilience.

It is important that there is commitment from communities that they will review their own resilience as well as relying on support from key resilience actors.

Building community resilience can be a multi-faceted approach that will likely require consideration of a variety of solutions. Solutions may be investments into an uplift of community education, co-funded models of community hubs or mutually beneficial assets, trialling new types of technology such as microgrids, strengthening network assets to withstand the exposures of climate change or a combination of them all.

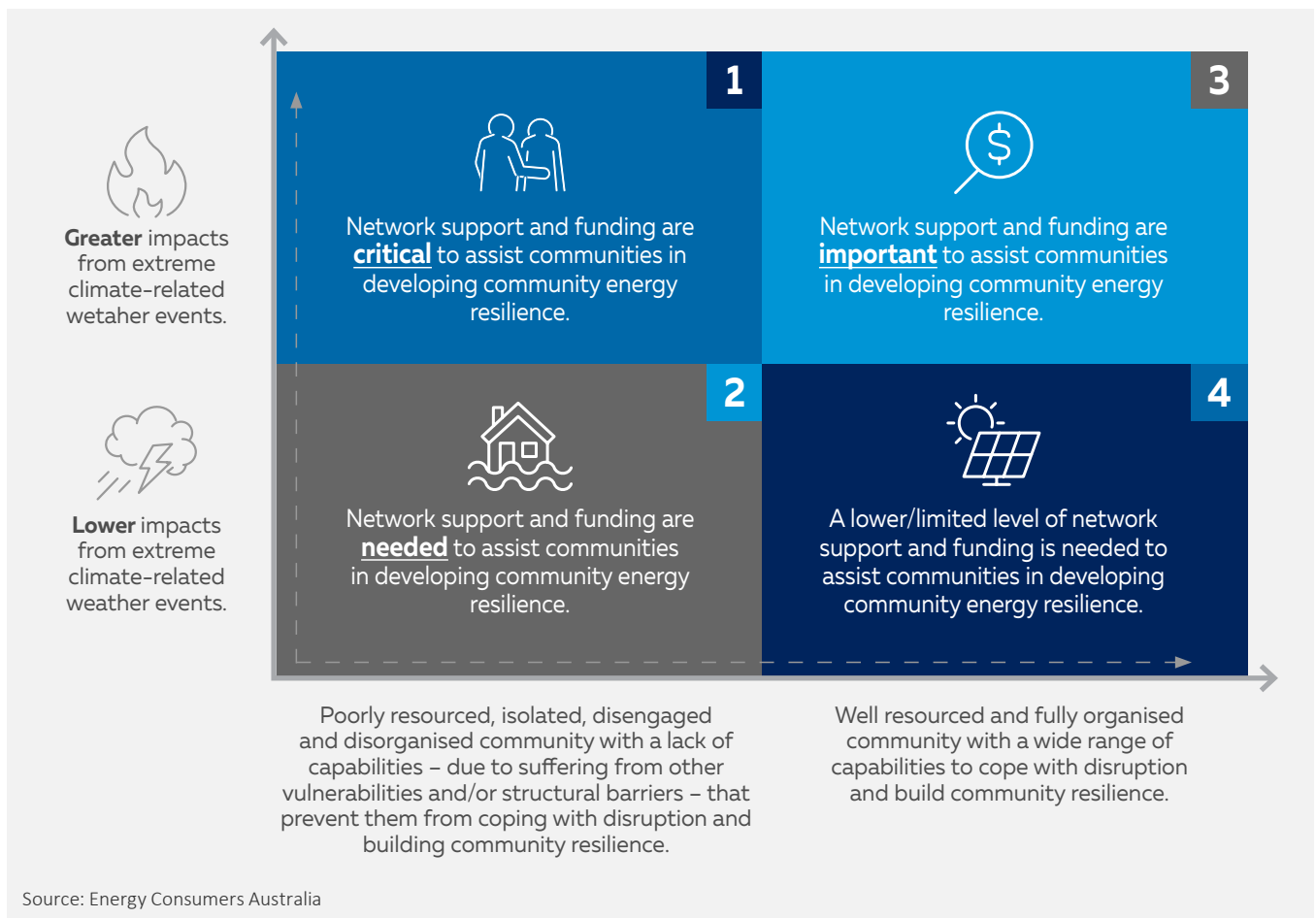
Ausgrid needs to have a clear definition of what its role/scope is. This can be done by Ausgrid having a clear sense of what the communities' expectations of Ausgrid are and what Ausgrid customers are willing to pay for. The following principles are intended to assist Ausgrid in understanding the appropriate boundaries of its role within the local community for resilience activities:

- Ausgrid should seek to clarify the roles and responsibilities of the different stakeholders who provide essential services and critical infrastructure within the targeted geographic area;
- Ausgrid should identify which activities it is best placed to provide, and which are best provided by other resilience actors (similar to the joint planning process with Transgrid and the RIT-D process with large projects);

- Ausgrid should partner with government, local councils, resilience organisations and local communities to assist them to develop a localised resilience plan;
- Based off strong community feedback, Ausgrid should increase its communications to customers during events so they can better prepare; and
- Local resilience plans should be built upon the following foundations:
  - foster ongoing trust and confidence
  - empowering communities to understand risks and encourage self-reliance
  - activities to prepare for and reduce the impact of an extreme weather event
  - integrated action between actors
  - strong and inclusive engagement
  - risk aware and forward looking
  - community-led approaches and place-based planning.

As outlined in **Figure 5**, Ausgrid should consider the prioritisation of network support and funding for communities more likely to be severely impacted by extreme weather events while considering the communities capacity to cope.

**Figure 5: Prioritisation of network support and funding for communities more likely to be severely impacted by extreme weather with consideration of capacity to cope**



## 5.2 Embedding engagement within roles and responsibilities

All parties with responsibility for resilience will have a role in the delivery of engagement, and the purpose and nature of Ausgrid's engagement will adapt depending on the role Ausgrid has to play.

Initial phases of engagement will focus on understanding roles and responsibilities of active or potential partners. As engagement progresses in line with the Framework, Ausgrid may be solely responsible, work in partnership with others, or rely solely on others for the delivery of engagement.

It is Ausgrid's intent where there are no existing partners in a specific local community with an active approach to resilience to support and foster other organisations as appropriate to develop the expertise and necessary plans.





# Climate Impact Assessment

To analyse the problem the Framework focuses on examining the risks of and impacts from severe weather events and associated options. This requires an understanding of the following:

- what is the base case for risks to network assets and impacts to customers from severe weather events;
- what can Ausgrid predict about the future of those risks and what level of confidence it has in those predictions; and
- what is the link between increased risks of severe weather events and likely physical risks to Ausgrid's network and impact on customers?

What is:



The following section steps through these three considerations while having regard to the impact of climate change on Ausgrid and the communities it serves.

## 6.1 Base case – what is known

Ausgrid's current risk forecasting utilises historical performance data and therefore excludes the impacts from increasing future climate events. Despite this, existing controls have been adapted to contribute to improved network resilience.

### For example:

When replacing low voltage overhead conductors, Ausgrid's design and construction standards include using insulated conductors which improves the mechanical strength, mitigates conductors clashing together and reduces the risk of a person contacting live conductors.

While this change has not been justified on the basis of increasing climate risk, climate resilience benefits are still expected to be realised from this change over time.



The base case reflects the risks excluding potential future climate impacts and the associated controls which may also provide some climate resilience benefit. With the increasing climate risk, the roll-out of existing controls may accelerate or new controls may be introduced.

Recent significant events including severe bushfires, storms and floods have reinforced the impact that climate change has on the community. The impact of these events to customers can be measured by:

- the damage caused to network assets;
- the damage caused to 3rd party property;
- customer interruptions (size, duration, and related economic impacts reflected by value of customer reliability [VCR]);
- impacts to other essential services (e.g. water, telecommunications etc.);
- safety risks posed to customers (e.g. statistical value of a life saved);
- the cost to recover, including AER pass through applications;
- customers lived experience; and
- other economic customer impacts.

While traditionally these events have been considered difficult to predict and outside of Ausgrid's control, existing and ongoing responses have been implemented to reduce the impact of severe weather events and responses. Ausgrid's existing planning and construction standards are based on well-established principles, supported by experience and long-term operations. When new assets are installed, they are constructed to these latest Australian and International standards, and often provide an inherent performance improvement, including:

- planning standards for network configuration such as feeder and switchgear arrangements; and
- asset design and construction standards such as conductor insulation and pole strength.

These standards generally reduce the likelihood of failure or consequences under multiple scenarios including during severe weather events. Existing standards support:

- roll-out of smart devices with sensors;
- procurement of higher mechanical and electrical rated assets;
- implementing higher design standards;
- greater network segmentation;
- improved emergency response practices;
- improved triaging; and
- improved customer communications.

## Examples

### 1. Covered conductor

Covered electrical conductor (overhead wire) is generally protected from vegetation contact and is less likely to fail or cause a network interruption compared to a bare conductor. This is due to the additional design strength gained by the rubber insulation and the physical barrier it provides to vegetation. If it does fail, the insulation minimises the risk of the public contacting live conductors on the ground or within reach.

### 2. Network segmentation

Reducing the length of a feeder covered by a single circuit breaker through greater network segmentation will mean that when there is a network interruption, there are less customers affected. Smart sensors, able to locate a fault, also support the restoration of customers by further segmenting only the affected portion of the feeder and providing useful information to response crews to make safe and restore.

### 3. Community safety campaigns

Ausgrid's community safety campaigns have focused on education for the public on the risk of fallen wires, reminding the community of the danger and the requirements to stay clear.

While Ausgrid has and continues to progressively implement these controls, their effectiveness is limited by the locations in which they are installed, which to date have not taken into consideration the impact of historical severe weather events or future climate change. These controls do not provide a level of climate resilience at a speed commensurate with the growing risk on the network due to climate change.

Ausgrid will consider the following overview of its historical data to inform and establish the base case:

- identification of existing data on particular risks and measurement of their impact;
  - physical measures of customers interrupted and duration (SAIDI/SAIFI including MEDs) and impacts to communities as results of hazards (e.g. bushfires);
  - how costs were recovered through customers (allowances, pass through, insurance); and
  - knowledge and experience about how various communities in its area responded to particular events
- role of government and community organisations.

- what changes Ausgrid made to its emergency response practices following a review of previous disaster recovery operations of events from this risk;
- what insights does this data provide for 2024–29 (e.g. balance of preparatory and responsive expenditure); and
- previous consumer consultation/feedback on these issues.

This overview would also provide an understanding of how existing asset management practices have evolved to better address these risks and improve network resilience.

## 6.2 What can be predicted with confidence

Advancements in data science and climate modelling support Ausgrid to apply forward looking climate projections to both its chronic and acute risk modelling. These models have different confidence levels and impacts vary depending on the expected climate change scenario.

Climate change scenarios vary depending on the extent and speed of global emissions reductions. Social, economic, political, and environmental factors makes this difficult to predict and so multiple climate scenarios, based on low, medium and high emissions pathways, need to be considered.

### Emissions Pathways

The continent of Australia has, on average, warmed by around 1.4°C between ~1910 and 2020, influencing heat extremes, rainfall (more time in drought, but more intense heavy rainfall events), number of dangerous fire weather days and a longer fire season.

- Physical risks can manifest as damage and interruption to assets and property due to changing climate conditions (chronic risks) or more frequent and intense extreme weather events (acute risks). The probability and severity of these events must be assessed against a range of possible future climate change outcomes assessed over decadal length timeframes. These scenarios, also known as Representative Concentration Pathways, are a measure of greenhouse gas intensity. They include:
  - low emissions pathway (RCP 2.6) – a world where global warming is kept to below 2°C, which would be in-line with the ambition of the Paris Climate Agreement.
  - medium emissions pathway (RCP 4.5) – a world with modest levels of mitigation where global warming would be approximately 3°C.
  - high emissions pathway (RCP 8.5) – a fossil fuel intensive future where global warming could exceed 5°C.

While the medium emissions pathway is generally considered to be the most likely scenario based on current assessments of emissions reductions commitments and demonstrated actions, assignment of distinct probabilities is difficult. This stems from the inherent challenges of specific outcomes from a climate science perspective

(the way the climate factors will respond and at what magnitude e.g., non-human emissions such as methane released from thawing permafrost which would naturally tip us into a higher RCP scenario), which is further compounded by the multitude of political, economic and social factors that play an important role in influencing impacts and outcomes.

Historic carbon emissions have already locked in an impact to future climate. Therefore, Ausgrid must place resilience and planning central to its strategy now and in the coming decades given the long-term nature of its assets and be prepared for and respond to the challenges it, and the communities it serves, will face in the decades ahead.

### Climate Modelling – Confidence and Probability

Ausgrid recognises that in its modelling it must consider two related but distinct factors. Firstly, the accuracy of the modelling provides a parameter that reflects the confidence in the modelling itself and is articulated through the Intergovernmental Panel on Climate Change (IPCC) confidence table below. The second parameter is the output of the modelling itself, which is considered in the probability of extreme weather events occurring.

Future climate modelling predictions have different confidence levels<sup>6</sup> ascribed to them. How these confidence levels should be interpreted requires explanation.

Confidence Terminology	Degree of confidence
Very high confidence	At least 9 out of 10 chance
High confidence	At least 8 out of 10 chance
Medium confidence	At least 5 out of 10 chance
Low confidence	At least 2 out of 10 chance
Very low confidence	Less than 1 out of 10 chance

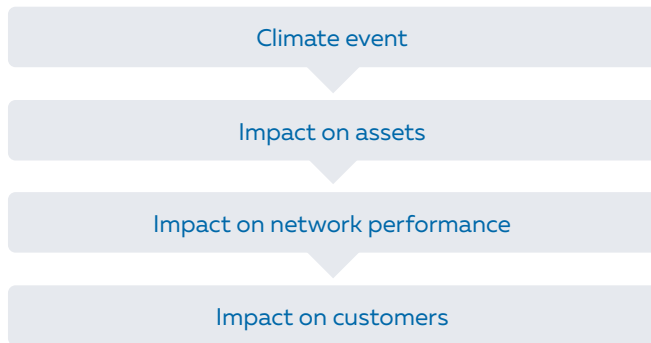
Climate modelling shows the increasing probability of different extreme weather events occurring. For example, by 2050 under a medium emissions scenario there will be a 31% increase in extreme heat days (days above 35°) in places like Scone.

Ausgrid’s impact modelling will be refreshed as climate data and confidence levels increases. This will occur, at a minimum, every reset period so the most up to date evidence-based data can be incorporated.

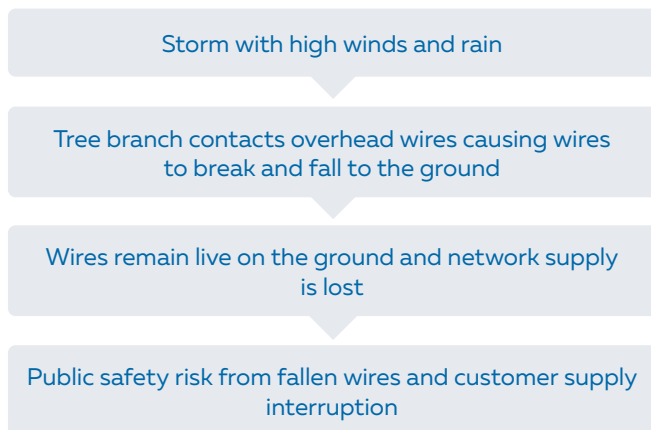
<sup>6</sup> [https://archive.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/ch1s1-6.html](https://archive.ipcc.ch/publications_and_data/ar4/wg1/en/ch1s1-6.html)

## Customer Impacts

The impact of climate events on network assets and on customers follows a sequence of events. Typically, this follows:



The configuration and design of the network may be such that the failure of a single asset may have little to no network impact. This could be due to network redundancy and protection. An example of how the sequence of events may occur is shown below:



The storm may also make it difficult for response crews to gain access to the location where this event has occurred. Furthermore, the more widespread the impacts are, the more stretched response resources become, leading to further delays in making safe and restoring supply to customers.

While the customer impacts may be high, the probability applied in predicting these customer impacts reduces the forecast risk. Applying probabilities balances the significance of the customer impacts with the likelihood of these impacts being realised.

Historical data provides some indication of the likely customer impacts from future climate events, however, there are many internal and external factors that make it challenging to predict these impacts.

### For example:

If parts of the network do not have vegetation, then there is a low likelihood a tree branch will impact that part of the network. By looking at how vegetation has impacted asset performance historically, we are able to apply a probability with a level of confidence to future climate events.

This historical data is balanced with external literature which examines the impact of climate events on network infrastructure.

As Ausgrid continues to collect more climate related data, it can improve the confidence in predicting customer impacts from climate events and the priority of controls.

### What can be done?

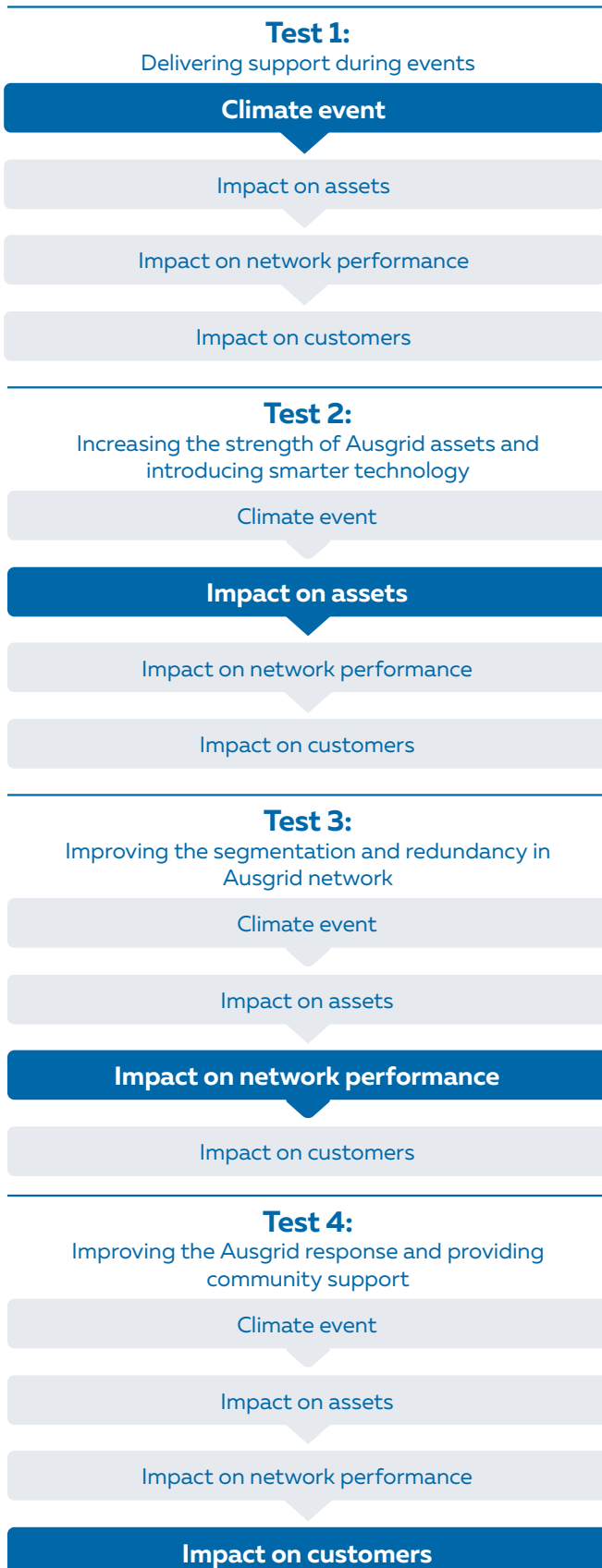
At each stage of the sequence of events, Ausgrid can implement a range of controls with varying effectiveness to ultimately minimise the impact to customers. As above, a range of factors will impact the effectiveness of controls including the size and severity of the weather event, the design and condition of the asset it impacts, and the configuration of the network it supports.

### For example:

Covered conductors will protect the overhead wire from most vegetation contact, however, if a large tree is uprooted, it is likely the conductor will still fall to ground and still cause a customer interruption. In this case the control is effective in most but not all scenarios.

Furthermore, our vegetation management practices include the assessment of tree health to minimise the risk of a tree uprooting. Again, identifying and replacing trees before this occurs has a limited effect and can be highly dictated by the size and severity of the climate event and the climate conditions that preceded the event (e.g. extended droughts can weaken vegetation and increase the likelihood of damage in a storm).

By applying multiple controls across the various stages, Ausgrid can improve the effectiveness in mitigating poor customer outcomes. The key control themes for the proposed sequence of events are as follows:



While the most effective mitigation of climate events is the combination of multiple controls, implementing these comes at a cost to customers. Utilising risk based economic evaluation, the risk mitigated (including probabilities) can be compared to the cost to implement to determine value to customers.

As these controls are implemented, their effectiveness will continue to be assessed based on their performance during future climate events. This ongoing review will improve control confidence, impacting probabilities, and providing a better long-term outcome for customers.

### 6.3 What is unknown

When looking at what is unknown, Ausgrid must consider what cannot be predicted or what cannot be controlled or influenced. This consideration requires drawing a distinction between the unknowns and uncertainty.

As climate resilience is further investigated, data is captured and modelling matures. What was previously believed to be unknown can be forecast to a level of confidence. This has been shown through the evolution of climate science modelling moving from climate events being unknown or random, to being predictable with a level of confidence and is expected to continue to improve into the future. As data is captured and modelling continues to mature, the uncertainties and unknowns can be better incorporated into our risk management processes.

In 2024-29 Ausgrid’s climate impact assessment will indicate which RCP emissions target (or weighted combination) it is using as the basis for its impact assessment.

Innovative technologies have seen a shift from traditional long lived mechanical assets to electronic devices with greater functionality and effective control. While we continue to investigate new technologies, the effectiveness of them may not be well understood. Trials provide a mechanism to evaluate the effectiveness of these controls, better understand unknowns, and make decisions on whether to adopt or abandon these options. Depending on the proposed control and what is understood by its effectiveness, the pathway to implementation will be considered by a trial to escalate it from an unknown technology before it is widely rolled out across the network.

## 6.4 Future trends

It is important to recognise that this Framework is not a single exercise; models will continue to mature, confidence levels will change, consumer needs will shift, and a range of other socio-environmental factors will change.

Ausgrid therefore needs to provide modelling about severe or extreme future weather risks – both for the 2024–29 period and beyond. The purpose of this would be to allow further refinement of the risk strategies and optimising the Framework. This would include:

- reassessing climate risks and likelihood of impacts on Ausgrid’s network;
- how might these risks/geographic impact change over the 2024–29 period vs. post 2029 to 2050, and by the end of the century;
- possible insurance projections (if applicable as global severe weather events are impacting on the insurance market) and
- changes in communities’ expectations

In addition to this Framework, the most effective tool we have is VCR. However, we recognise that there is significant work ahead in better understanding the true value of energy supply in communities affected by severe weather events. Ausgrid will continue to undertake research in this area to better refine its investment approach.

## 6.5 Causal link between the future trends and asset performance

Ausgrid needs to demonstrate a sufficient causal link between any increase in the risk and damage to network assets that are likely to lead to an impact to community or asset safety and quality of supply. This will provide:

- information on the impact of these risks on performance or expected life of network assets;
- changes Ausgrid has already made to its asset management practices to mitigate the risks;
- information around safety impacts around failed assets;
- information around cost to repair failed assets; and/or
- community impacts of asset failures and network outages.

Where the causal link is uncertain or further research is needed (e.g. extreme heat and heatwaves), Ausgrid will do further research to establish the causal link.





# Options Identification and Evaluation

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Once the base case impacts on customers and community, future risks and causal links are established under **Section 6** and community expectations of Ausgrid's role and responsibility in relation to those future risks are clarified under **Section 5**, Ausgrid needs to identify the options available to address these future risks.

This section sets out the approach to address the parameters established in **Sections 5** and **6** with a structured process which considers a range of options, applies robust analysis to understand the relative costs/benefits of each option and considers the outcomes in terms of fairness and equity among customer groups.

## 7.1 Criteria for decision making

Through internal discussion, and the co-design process, we identified the key 9 criteria below that will define how Ausgrid should review, identify and evaluate various options as part of its resilience decision making. Ausgrid will demonstrate fulfilment of these criteria to support claims for resilience funding for investments and trials in the current regulatory period. Inevitably it will use a range of traditional quantitative approaches along with qualitative measures.

**1 Modelling must be mature enough to support a credible forecast.**

- a) Climate data and modelling is up to date and current and is backed by climate scientists.
- b) Asset failure modelling is done by engineering experts and demonstrates levels of risk.
- c) Levels of confidence are understood and made transparent.

**2 Investment decisions are based on the risks to customers using modelling of weather-related perils overlaid with their expected impact on customers.**

- a) Areas with highest risk (network and community) will be investigated for resilience related activities.
- b) Both network and community resilience solutions will be considered for areas considered high risk.
- c) The fairness and impact of some customers' reliability materially falling below average levels due to climate change and their location on the Ausgrid network will be considered.
- d) A customer equity and capacity to cope lens will be applied.

**3 All resilience solutions should be considered (network, non-network, and community).**

- a) Spectrum of resilience solutions and their benefits, risks, safety elements, and costs have been considered and tested - this can be demonstrated (e.g., such as support services such as community hubs, education, grant programs, co-funding arrangements, other community led initiatives, and asset investments etc.)
- b) Communities will help shape resilience options with Ausgrid.

**4 There should be collaboration and coordination between Ausgrid and other resilience actors.**

- a) Ausgrid understands its role within the resilience ecosystem - which may differ during different phases of an event, and based off the communities capabilities (e.g., before, during and after the event).
- b) Customers have had input with Ausgrid's community resilience opportunities.
- c) Ausgrid can demonstrate engagement and collaboration with other resilience actors.

**5 Ausgrid needs to demonstrate a causal relationship between the proposed resilience expenditure (by category or project/program) and a reduction in customer impacts from the increase in extreme weather which would otherwise be expected.**

**6 The suite of benefits is supported by evidence and addresses the problem statement or, where required, trials run concurrently with prioritised investments. The credible least whole-of-life cost option(s) that improve customer outcomes and/or promote the maintenance of service levels are selected.**

- a) Through the use of the tools of cost benefit analysis and cost benefit ratios, noting the difficulties in valuing WALDO.
- b) demonstration of benefits to the network, community resilience, health and wellbeing, and safety from expenditure.
- c) Demonstration of lowest whole of life cost.
- d) Demonstration that most affected communities' service levels are maintained or improved.
- e) The approach to the solution should be clearly communicated, and must be understood by the community.

**7 There must be customer support for resilience options.**

- a) Customers have demonstrated that they are willing to pay even though only some customers will benefit.
- b) Affected communities in the targeted geographic areas have helped generate a list of resilience options, and Ausgrid has provided community with network specific options that typical community members may not be experts in.
- c) Options are consistent with the co-designed priority principles.

**8 Ausgrid must demonstrate that communities receiving the benefits of Ausgrid resilience investments are engaged with their reciprocal community resilience obligations.**

The previous principles broadly support robust analysis, effectiveness and value for money.

In a postage stamp pricing environment, where average customers pay the same prices regardless of location in Ausgrid's supply area, any localised Ausgrid investment in resilience will effectively be paid for by all Ausgrid customers through their tariffs. The fairness of all customers paying on a postage stamp basis yet receiving variable levels of reliability depending on their location needs to be considered too.

This is to provide an incentive for communities to implement their own resilience solutions in conjunction with any investment Ausgrid might make and help avoid the situation where all Ausgrid customers pay for an investment in resilience in a local community which simply waits for Ausgrid to act rather than engaging on resilience.

High risk identified geographic areas must therefore demonstrate that community resilience is being reviewed at a local level (e.g. community does not necessarily need to have a resilience plan, but there needs to be a commitment of resilience planning) before resilience investment is committed.

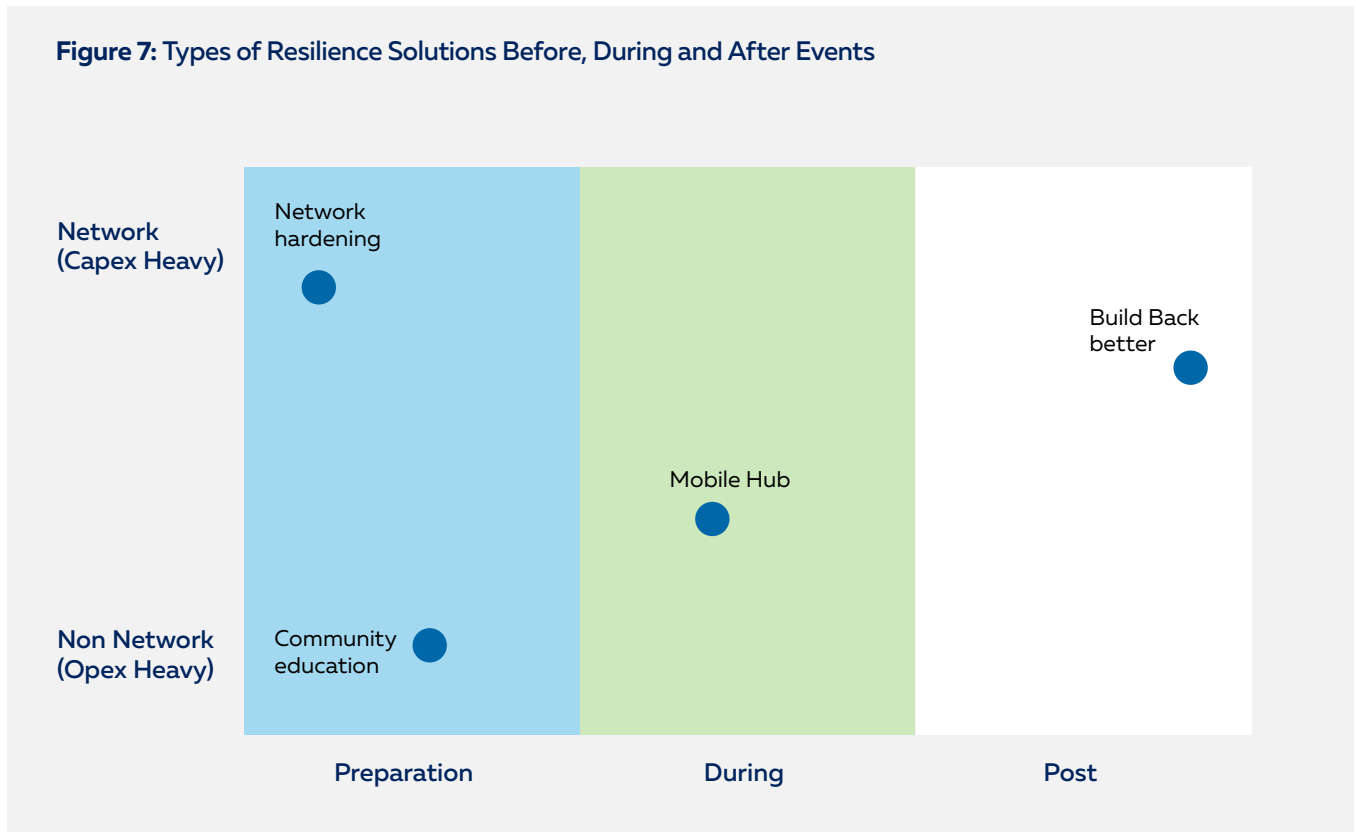
- a) Gap analysis has been conducted and identified of communities with commenced planning activities.
- b) Communities who have not commenced planning activities may be aided by Ausgrid and other partners to initiate.
- c) Ausgrid notes that the capabilities of communities may vary quite significantly, and will be considered accordingly based off need and how communities wish to be engaged.

**9 Ausgrid is conscious of the intergenerational equity issues. We note that early investment in actions to address resilience may often be efficient and consistent with community expectation. However, we must balance this opportunity with several other considerations being:**

- a) Changes in technology or consumer needs that suggest different solutions may be appropriate in the future
- b) Changes in environmental conditions suggest that alternative locations are raised in priority
- c) Capital constraints exist as Ausgrid pursues affordability for consumers.

Solutions will vary before, during and after events and will involve different levels of capex and opex. This is illustrated in **Figure 7**.

**Figure 7: Types of Resilience Solutions Before, During and After Events**





### Example - Prevalence of higher or more frequent winds leading to higher frequency of pole failures

For a representative set of 10 poles, in an area where we are expecting worse wind conditions due to climate change, we would expect to see a higher number of pole failures over a particular period, say 20 years.

This is on the basis that a pole's end of life is effectively reached when it either breaks (functional failure), or testing shows that it will not have enough strength to dependably last until the next 5 yearly inspection with the loads we expect it to experience (conditional failure). In either case intervention is needed to prevent safety and reliability issues due to fallen wires and/or falling poles.

#### Some Implications

If we reliably expect a higher failure rate over the next 20 years, then taking appropriate preparatory actions are in line with what a prudent business would do.

Given the large statistical database Ausgrid holds for poles it can make relatively dependable predictions of the failure rate of these assets (combined functional and conditional). However, it is not possible to predict exactly which poles will fail.

Solutions will need to be tailored to respond to each communities problem statement and risk profile. The benefits and limitations of some solution examples are set out below.

Option Example	Benefits	Limitations
<b>Community Education</b>	<ul style="list-style-type: none"> <li>• Makes customers more aware of things which they can do, potentially at low cost to them</li> <li>• Can be broadly effective</li> <li>• Relatively low cost to deliver (opex), and therefore reflected on customer bills</li> </ul>	<ul style="list-style-type: none"> <li>• Does not remove impacts</li> <li>• Does not materially leverage the capability of Ausgrid's existing assets to offer improved performance through marginal investments</li> </ul>
<b>Mobile resilience hub ("Support Caravan")</b>	<ul style="list-style-type: none"> <li>• Mobile so can be used in multiple locations to support more customers</li> <li>• Relatively low capex costs, and therefore reflected on customer bills</li> <li>• Can provide a focal point and/or be leveraged by other agencies to support customers during extreme weather events</li> </ul>	<ul style="list-style-type: none"> <li>• Does not prevent impacts on customers</li> <li>• Does not materially leverage the capability of Ausgrid's existing assets to offer improved performance through marginal investments</li> <li>• May be oversubscribed during large weather events</li> </ul>
<b>Build back better</b>	<ul style="list-style-type: none"> <li>• Marginal cost over build back like-for-like</li> <li>• Targets areas where customers are experiencing extreme weather events</li> </ul>	<ul style="list-style-type: none"> <li>• Customers still experience significant events before intervention</li> <li>• Time constraints of recovery may limit options</li> </ul>
<b>Pre-emptively replace poles with stronger ones on targeted basis</b>	<ul style="list-style-type: none"> <li>• Reduces risks and avoids customer impacts</li> </ul>	<ul style="list-style-type: none"> <li>• How do we target the right poles</li> <li>• Solution is long lived assets- what if we are wrong about severity (say it gets better)</li> </ul>

**Note:** Different solution options may deliver the best outcomes in different locations with different climate impacts, so the Ausgrid wide solution may be made up of a combination of options.



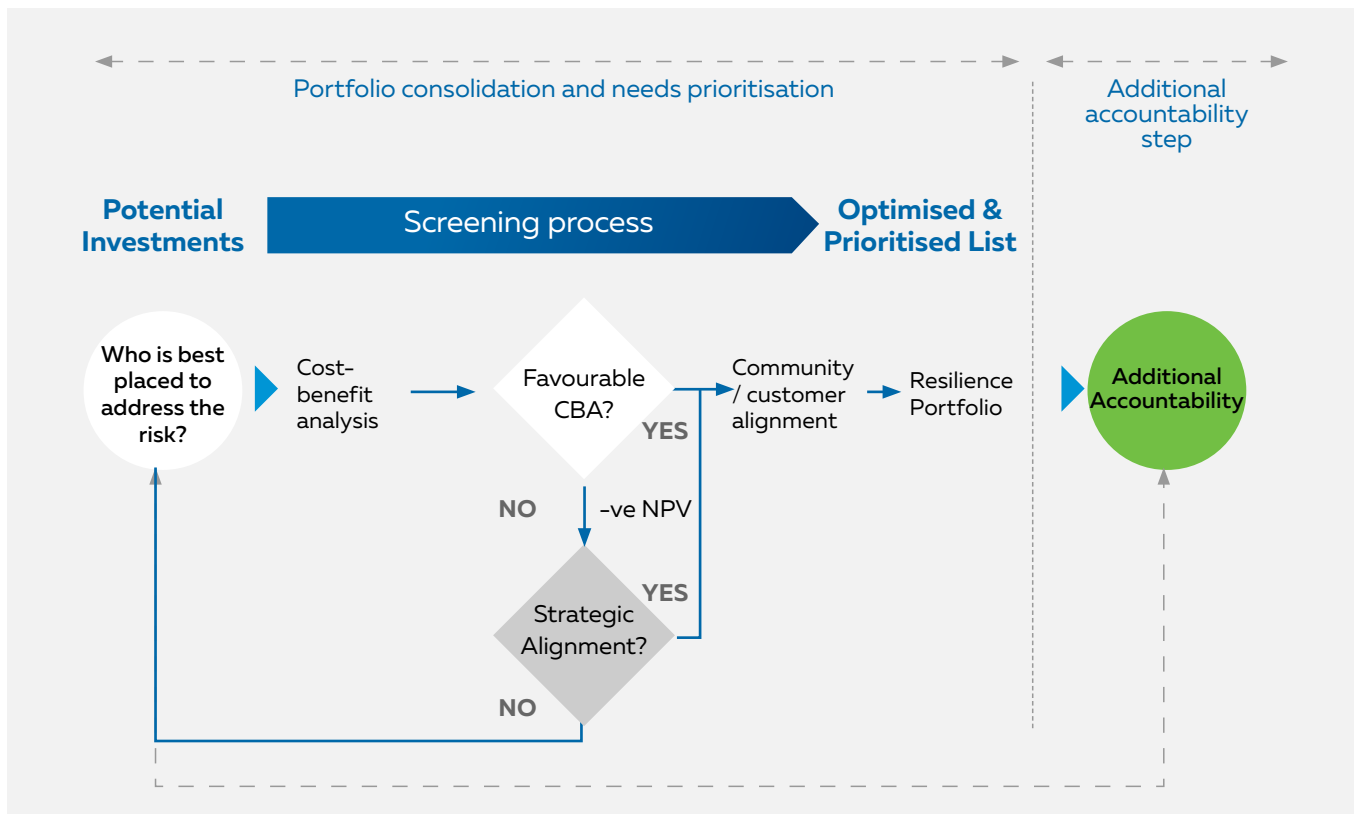
## Preparing a resilience portfolio for the regulatory proposal

The purpose of this section is for Ausgrid to take the list of economically viable solution options (costs and outcomes) from **section 7** and to develop them into an optimised portfolio and program of activities, trials, pilots and investments to be included in a revenue proposal. The steps to achieve this are:

- review universe of options as a result of **section 7** of the Framework, including inter-relationships with other programs of work;
- develop prioritisation principles to build a portfolio. Ausgrid to engage with the broader community on the prioritisation principles and understand why the community values specific options. Some relevant prioritisation principles may be net present value (NPV), risk appetite, strategic alignment, balance between preparatory and responsive programs, customer feedback and consistency with community resilience plans;
- engagement to ensure portfolio can be delivered as a whole and individual options meet customers' expectations and retest willingness to pay;
- review of delivery capability and resourcing; and
- additional accountability requirements of the portfolio under **section 10** of this Framework.

**Figure 8** illustrates the process for preparing an optimised portfolio.

**Figure 8: Process for preparing a resilience portfolio**



Community engagement will be a large part of both preparing and optimising the portfolio. Ausgrid should seek community input in prioritising the solutions. **Section 9** will inform how Ausgrid will seek feedback from the community generally about their risk appetite and for consistency with their existing community resilience plans (where relevant).

## 8.1 Optimising the portfolio

Once options have been established under **section 7**, Ausgrid needs to identify, optimise and test with the local community the preferred options and funding programs. The optimised program needs to clearly distinguish between incremental BAU initiatives, and new responses that should be trialled. Incremental BAU investments should be prioritised when they unlock the most benefits for customers. Targeted trials and pilots should be run for resilience measures involving less mature technologies or with more uncertain benefits.

The following information and questions should be addressed by Ausgrid when it is incorporating its portfolio of resilience funding into its 2024–29 regulatory proposal:

1. Detail of opex and capex funded initiatives and the balance between them.
2. Flexibility in resilience option/spend categories (range of network and non-network solutions has been considered to maintain and improve resilience).
3. The balance between local community expectations to build back better and to build back faster after an extreme weather event. While communities expect it, there is generally limited capability to build back better after an extreme weather event.
4. The balance between preparatory and responsive expenditure.
5. How the expenditure is optimised to meet the NER objectives (e.g. reliability and safety maintained [at best])?
6. How have the learnings from the previous regulatory period, trials, recent events or from industry been incorporated into Ausgrid decision-making for the current regulatory period? Do the learnings establish a sufficient basis to change asset design standards and management practices?
7. Has sufficient resourcing (opex and capex) been allowed for NIAC for review (PIR) of the effectiveness of network and non-network investments and trials and pilots of benefits for future investments (preparatory and responsive).

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## 8.2 Presentation of portfolio

Resilience related activity and expenditure for the 2024-29 regulatory proposal will be presented to:

1. Provide a holistic view of Ausgrid's network, non-network, and community based activities including BAU and trials and pilots presented by risk and identified as those activities focussed on preparation, those focussed during the response and those focussed on the recovery phase.
2. Identify which solutions are to be led by Ausgrid, other resilience actors, and the local community.
3. Highlight how Ausgrid selected the capex/opex expenditure? What prioritisation principles were used and how did customers influence the choices made?
4. Show how Ausgrid has confirmed that its customers are willing to pay for the activities to address impacts in the targeted geographic areas.
5. Provide view of how Ausgrid prioritised investment across higher risk areas with consideration for a communities' capacity to cope.





# Community Engagement

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Community engagement and consultation is a key focus of this Framework. Ausgrid's engagement approach will be oriented around the needs, understanding and interests of customers and stakeholders and will be designed to build on each group's ability and capacity to engage.

Ausgrid and the RCP recognise that resilience is not one size fits all; community resilience is a shared responsibility and solutions will need to be tailored to meet the unique needs of each targeted local community. Many of Ausgrid's customers and stakeholders may face cultural, resource, knowledge or structural barriers to participating in engagement processes. Some customers are familiar with the energy sector, have the resources to participate and will be confident to speak up. Others will have a lower level of understanding of energy issues and may not even be aware of Ausgrid's relevance to them. They may also be less confident to participate in traditional ways, or have limited time, may not speak English as a first language or have limited access to technology.

Consistent and regular community engagement and Ausgrid's commitment to partner with others in the community is essential to realise the goals of this Framework.

## 9.1 What good engagement looks like and IAP2 goals and principles

Customers and communities should have a say in how Ausgrid adapts to climate change and supports communities in their preparation, response during and recovery from extreme weather events. Therefore, the RCP believes that Ausgrid needs to be clear how its community engagement about its resilience decision making under this Framework is aligned with IAP2 goals and principles.

# IAP2 Spectrum of Public Participation

IAP2's Spectrum of Public Participation was designed to assist with the selection of the level of participation that defines the public's role in any public participation process. The Spectrum is used internationally, and it is found in public participation plans around the world.

INCREASING IMPACT ON THE DECISION					
	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

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The features of good engagement under this Framework include:

- consulting locally with those who may be impacted by proposed resilience projects (outside of obligations under Ausgrid's licence conditions) and giving local communities an opportunity to participate in the decision-making process;
- engaging with those affected in a way that empowers them to influence the decision and outcome;
- designing an engagement approach that is sustainable and is balanced with the needs of communities and decision makers;
- seeking out and facilitating the involvement (including the removal of barriers to participation) for those potentially affected by or interested in a resilience project decision;
- seeking input from communities, including energy experts within the community, when designing how they participate;
- providing communities with the information they need to participate in a meaningful way;
- developing robust processes to seek views on willingness to pay and in particular the willingness of all customers to pay for greater preparatory expenditure in the highest risk parts of the network through higher bill impacts or lower levels of service; and
- communicating to participants how their input has influenced and shaped the resilience decision.

## 9.2 Who to engage and when?

Ausgrid's customer and stakeholder base is broad: from the 'citizen consumer' to the 'home user' to major businesses and industry. Ausgrid will adopt a variety of approaches to reach various stakeholders when looking at future resilience options and they will be given the opportunity to participate in the decision-making process.

Ausgrid will also respond to the diversity of its customers' culture, language, demographic and socio-economic status and work with third parties and trusted community leaders to help us reach the 'missing voices' as necessary; shaping and comparing options.

Energy is a complex topic. Ausgrid needs to build customers' energy literacy and understanding by providing clear, visually appealing and jargon-free information. It should strive to tailor language to the drivers and interests of consumers and translate key information as required.

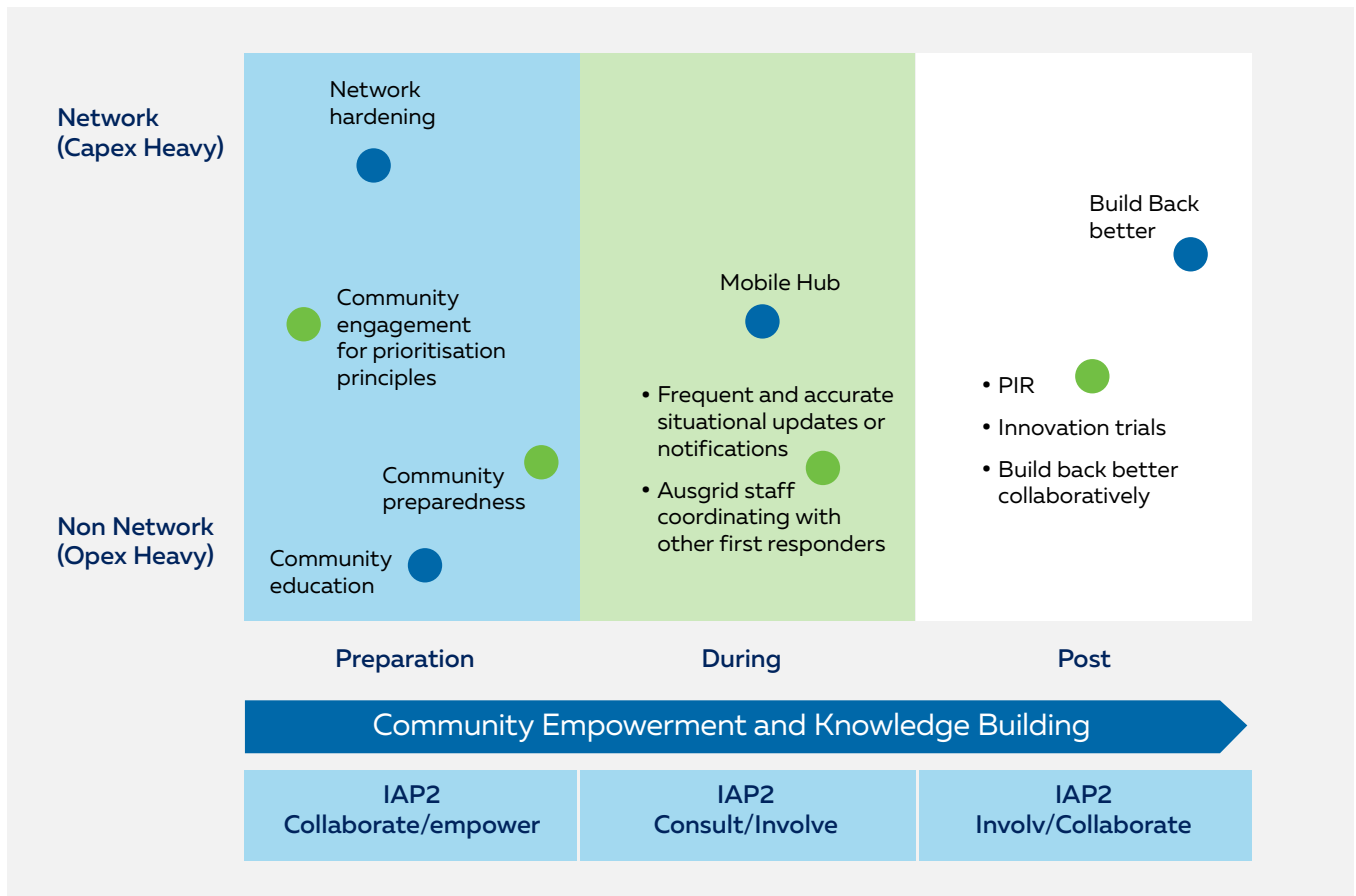
Based on what feasible options may be available to make the network and local community more resilient, these potential pathways will be discussed with the relevant communities and other resilience partners prior to delivery. Through robust stakeholder consultation, consumers will be informed about the different resilience expenditure options.

Framework for how we will approach engagement across different phases of the resilience framework.

Phase	Engagement objective	Who to engage with	Suggested methods	Desired outcomes	
Preparation	Community resilience principles and problem statement	Understand the broader context for community outcomes, customer appetite for resilience investments, and determine principles to be applied to such investments.	Representative household and business customers	Deliberative consultation 2024-2029	Set of principles for resilience investment decisions, including how to determine the fair distribution of resilience outcomes across communities, including the potential redistribution of service and price impacts
	Identification of at-risk communities	<ul style="list-style-type: none"> <li>• Enable communities to understand and take ownership of resilience</li> <li>• Understand the network implications in relation to broader community resilience</li> <li>• Integration of vulnerability index</li> <li>• Engagement of prioritisation principles</li> </ul>	<ul style="list-style-type: none"> <li>• Local Councils – other community organisations</li> <li>• Broader community</li> <li>• State or Federal governments or their agencies</li> </ul>	<ul style="list-style-type: none"> <li>• Council and partner meetings</li> <li>• Broad education campaigns</li> </ul>	<ul style="list-style-type: none"> <li>• Community resilience plans</li> <li>• Households and businesses take action to improve resilience</li> <li>• Clearly defined role for Ausgrid within the broader community's resilience context</li> </ul>
	Willingness to pay	Understand the willingness of the broader customer base to fund community specific resilience programs	Representative household and business customers	Deliberative consultation 2024-2029 Choice based surveys – 2029 - 2034	Customer acceptance of a principles-based framework of resilience funding outlining the nature, location and impact of likely programs and overall bill impacts
	Options identification and expectation management	<ul style="list-style-type: none"> <li>• Identify preferred solutions</li> <li>• Identify co-funding opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• Local Councils – other community organisations</li> <li>• Impacted customers</li> <li>• State or Federal governments or their agencies</li> </ul>	<ul style="list-style-type: none"> <li>• Focus groups</li> <li>• Community meetings</li> <li>• Surveys</li> </ul>	<ul style="list-style-type: none"> <li>• Understand any barriers and objections to preferred solutions</li> <li>• Determine appetite for alternatives including pre vs post event solutions</li> <li>• Agree co-funding arrangements</li> </ul>
	Implementation	<ul style="list-style-type: none"> <li>• Smooth implementation</li> <li>• Implementation that delivers for Ausgrid and the local community</li> </ul>	<ul style="list-style-type: none"> <li>• Local Councils – other community organisations</li> <li>• Impacted customers</li> </ul>		Community understanding, acceptance and embracing of resilience initiatives
During Event	<ul style="list-style-type: none"> <li>• Event Management</li> <li>• Community awareness</li> </ul>	Co-ordinated via emergency service organisation as appropriate	<ul style="list-style-type: none"> <li>• Emergency response teams</li> <li>• Media and social media</li> </ul>	Minimise impacts of the event	
Post event	<ul style="list-style-type: none"> <li>• Learnings for continual improvement</li> <li>• Reduction in the impact of events</li> </ul>	<ul style="list-style-type: none"> <li>• Local community</li> <li>• Impacted customers</li> </ul>	<ul style="list-style-type: none"> <li>• Surveys</li> <li>• Community support services – as agreed</li> </ul>	<ul style="list-style-type: none"> <li>• Identify areas for improvement</li> <li>• Evaluate effectiveness of measure implemented</li> </ul>	

**Figure 9: How Resilience Solutions Before, During and After Events Align with IAP2**

Figure 9 illustrates the role of the community and consultation in the choice of some illustrative resilience solutions.





## 9.3 The need to check back and validate with the community

Community engagement is a constant feature of the process underpinning this Framework. Several milestones are built into the Framework where Ausgrid will need to check in with its customers. These milestones should be seen as minimum engagement points when developing resilience funding:

- demonstration of customer willingness to pay;
- discussion/validation with the local community that resilience planning has commenced;
- consideration of proposed resilience options;
- demonstration of all customers' willingness to pay for localised benefits for only some customers; and
- evaluation of investments or implementation approaches as appropriate.

Some engagement will be with the targeted geographic area and some will be with the customer base generally, some may be applicable for both:

Ausgrid's broader customer base:

- prioritisation principles;
- getting some level of common understanding of the risks through the Ausgrid Voice of Community Panel (VoC)<sup>7</sup> and large customer engagement;
- seeking views on willingness to pay in the context of other concurrent cost pressures and in particular the willingness of all customers' to pay for greater preparatory expenditure in the highest risk parts of the network through higher bill impacts or lower levels of service (i.e. reallocation of opex/capex from other programs to fund the preparatory expenditure);
- seeking views on customers' appetite for preparatory vs. responsive expenditure;
- identifying customers' expectations during an outage
  - information provided, restoration times and role of Ausgrid vs. other parties (councils etc).

Local / Community specific:

- Ausgrid reports back to customers with updated climate modelling, and benefits (if applicable);
- co-design prioritisation principles;
- engage with appropriate community organisations (e.g. local Council) on steps the local community is taking to develop local resilience planning activities;
- getting some level of common understanding of the risks through VoC and large customer engagement;
- seeking views on value for money in the context of other concurrent cost pressures and in particular the willingness to pay for various alternative solutions;

- identifying customers' expectations during an outage
  - information provided, restoration times and role of Ausgrid vs other parties (councils etc);
- seeking views on customers appetite for preparatory vs. responsive expenditure;
- Ausgrid should continue to engage with its customers before during and after major events and unplanned outages to gain an accurate picture of customer's expectations (e.g. similar to initiative undertaken during Narrabeen December Holiday 2021 storm); and
- where Ausgrid wishes to supply temporary support over and above what it is required to do to make the area safe, secure its assets, diagnose faults and then repair assets to restore power supply, this needs to be the subject of engagement with customers. Some issues for that engagement include:
  - How many and what size mobile generators should Ausgrid supply?
  - Who should supply and fund back up supply for critical services that depend on electricity e.g. hospitals, fuel and water?
  - Who should pay for communications charging stations and community hubs for things like showers, hot meals, warmth and cooling?

## 9.4 The negotiables and non-negotiables in resilience planning

Ausgrid needs to demonstrate how it has satisfied the AER requirements for genuine consumer engagement in the Better Resets Handbook (nature, breadth and depth and impact of engagement) and in the AER Guidance Note on resilience expenditure options as a necessary (but not sufficient) requirement of resilience expenditure. The engagement outcomes that the AER has outlined in its Guidance Note include:

- engagement on how Ausgrid's preparatory funding proposal will ensure any risks to manage extreme weather events are allocated efficiently between consumers and Ausgrid to ensure that customers do not pay twice;
- collaboration with affected communities, and other responsible entities involved in disaster management, to understand what the communities' genuine needs are to plan and prepare for, as well as recover from a natural disaster including the degree of input these stakeholders have had in developing the proposed resilience related expenditure;
- Ausgrid consulting with its wider consumer base on their preferences for bearing resilience-related costs to address localised impacts; and
- a preference to see evidence of Ausgrid's customers' willingness to pay for the proposed expenditure.

Ausgrid and the RCP believe the above engagement framework achieves all these objectives.

<sup>7</sup> For the 2024-2029 reset engagement program Ausgrid established a panel of customers for deep deliberative consultation, this mechanism will be the means for testing whole of customer base views for this reset, but methods may vary in the future.



# Accountability

This section considers the accountability requirements that will apply to investment decisions to be made during the 2024-29 period after the conclusion of the regulatory reset process and a final determination from the AER. The purpose of the additional accountability process is to enable customers to monitor for any departures from the resilience related commitments made by Ausgrid in its regulatory proposal.

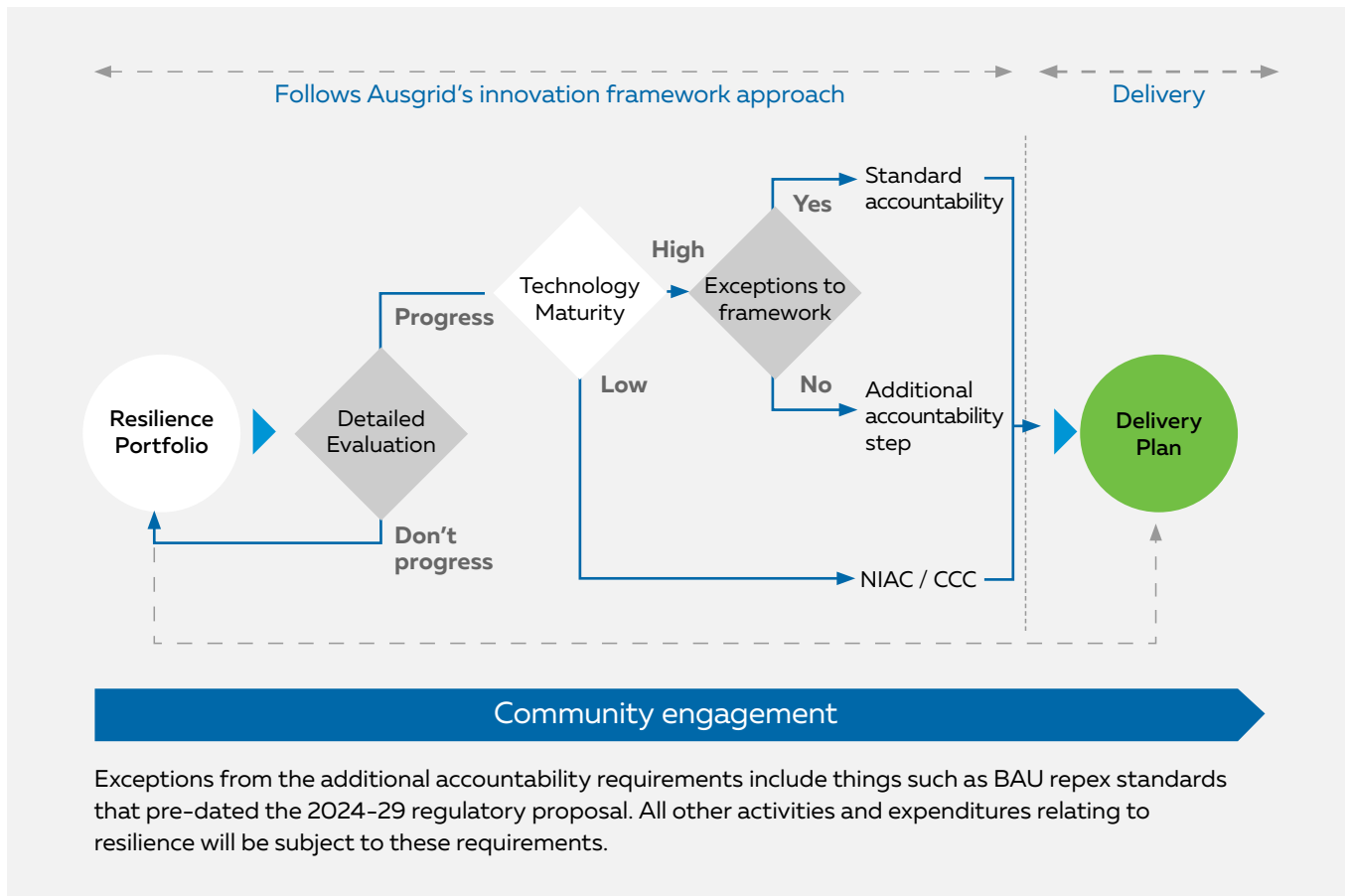
## 10.1 Additional accountability requirements

Ausgrid needs to be accountable for any departures in its resilience initiatives from those included in its 2024-29 regulatory proposal. This additional accountability will apply for all resilience related expenditure commitments (e.g. enhanced BAU, innovative technologies, community support services etc.) made by Ausgrid as part of its 2024-

29 proposal. All resilience expenditure identified in the regulatory proposal, including new resilience related BAU initiatives will be subject to the accountability processes illustrated below, with any exceptions called out in the regulatory proposal itself or subsequently agreed by NIAC or the CCC, for example with the covered conductor program, Ausgrid would need to outline criteria to identify which parts of the program are resilience and what would fall into BAU repex programs.

**Figure 10** shows how the proposed accountability requirements incorporates the role of NIAC, and its oversight of innovation, research, trials and pilots as well as oversight of enhanced BAU resilience activities that would fall into BAU investment programs.

**Figure 10: Standard example**



## 10.2 Measures of success

Ausgrid will engage with the broader community on appropriate measures of success for this Framework. Measures of success will include a range of lead and lag metrics incorporating:

- stakeholder satisfaction and customer engagement outcomes;
- community preparedness; and
- network performance.

Measures of success for consideration may include Reprack scores, engagement and satisfaction after extreme weather events, proportion of at-risk communities with resilience plans in place or under development, proportion of at-risk communities where Ausgrid has established partnerships, willingness to pay, network performance, delivery against the optimised resilience program.

In 2024–2029 Ausgrid will establish baseline measures of community expectations around the communities' involvement and engagement in developing resilience solutions.

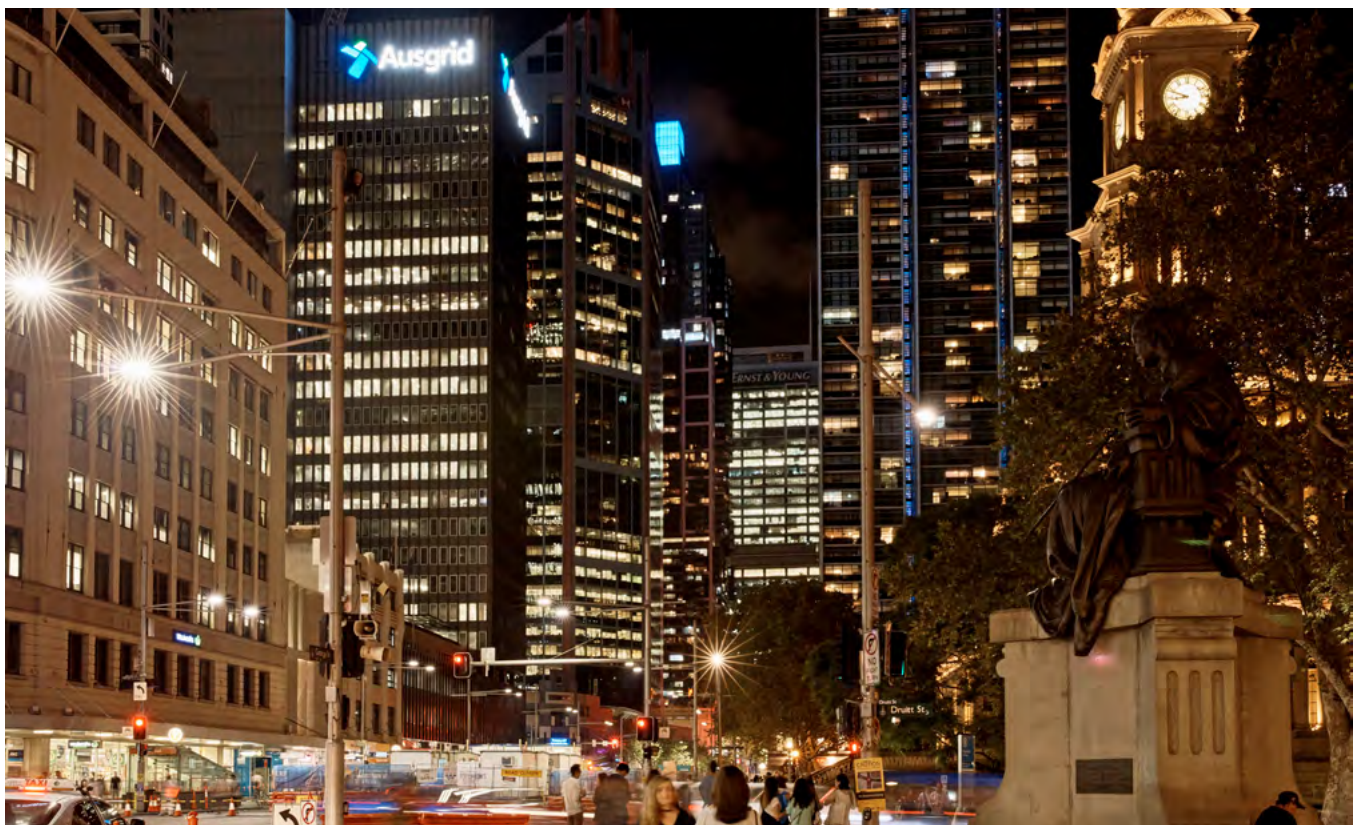
## 10.3 Lessons learned

Before the end of the 2024–29 regulatory period, Ausgrid and its CCC will jointly undertake a post-implementation evaluation of this Framework and the resilience decisions made pursuant to this Framework with a long-term perspective to determine:

- What worked well?
- What could have worked better?
- How might we modify the Framework for the next regulatory cycle?
- What other themes have emerged from implementing this Framework?
- Did Ausgrid positively contribute to building community resilience?
- Was the engagement of communities and stakeholders adequate?
- How effective was Ausgrid's response (if applicable)?

The review of resilience activities undertaken during 2024–2029 needs to consider a long-term view of the changing climate. Variation in climate and extreme weather needs to be taken into account at the conclusion of each regulatory period. For example, it is possible that there will be no severe weather events in 2024–2029.

Ausgrid will invest in updated climate risk modelling as the basis for resilience funding in each regulatory period to ensure as accurate a knowledge base as possible. This could also include reviewing the accuracy of past modelling in light of events in the interim.





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## Contact us

All correspondence in relation to this document should be directed to:  
Kara Chan, Senior Manager Climate Resilience and Strategy, Ausgrid at [Kara.Chan@ausgrid.com.au](mailto:Kara.Chan@ausgrid.com.au)