## Endeavour Energy Resilience Strategy

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## **Endorsement and Approval**

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## **Version History**

Version	Edited By	Changes
0.1	Samuel Morris	Document Creation
1.0	Samuel Morris	Incorporated customer feedback. Document finalised.



### **1.Introduction**

#### 1.1. Purpose

This strategy maps out how Endeavour Energy will achieve both community resilience as well as an increased resilient network in the face of changing customer expectations, an evolving industry and to mitigate emerging risks.

This strategy has been developed with respect to, and informed by customer expectations and preferences and has also been informed by the AER's guidance note, '*Network Resilience – A Note on key issues*' (2022).'

#### 1.1 Definition

In collaboration with other DNSPs and already established definitions<sup>1</sup>, Endeavour Energy defines resilience as:

"Resilience is the ability to anticipate, withstand, quickly recover and learn from disruptive events"

The key aspects of this definition include:

- Anticipate Using evidence and modelling to predict the likelihood and impact of disruptive events
- Withstand For the system and network to 'ride through' most disruptive events.
- Recover In the event of disruption, having robust plans and processes to minimise customer impact.
- Learn Review previous events and identify opportunities for improvements to get the best outcomes for customers.

#### 1.2 Scope

Endeavour Energy recognises the three resilience risk themes summarised in Table 1. These themes cover the key resilience risks which may impact Endeavor Energy's ability to meet performance targets and customer expectations.

This strategy considers resilience theme 1, Endeavour Energy's response to climate change. The other two resilience themes are covered in the Endeavour Energy publications referenced in Table 1.

<sup>&</sup>lt;sup>1</sup> Network Resilience - 2022 Collaboration Paper on Network Resilience. Developed by NSW/ACT/TAS/NT Electricity Distributors



#### Table 1: Resilience risk themes

Resilience Theme	Definition	Examples	Reference
1. Climate Change	An increase in frequency and/or severity of major weather events impacting the network and customers through changing demand or damage.	Bushfire, floods, high wind	<ul> <li>Sustainability strategy</li> <li>Resilience strategy (this document)</li> </ul>
2. Cyber Security	Cyber-attacks which disrupt the network.	Malware, DDoS, phishing	<ul> <li>ICT strategy and policies</li> </ul>
3. Organisation	Ability to adapt to organisational disruptions and continue BAU activities.	COVID, skills shortages	<ul> <li>Endeavour Energy's Human Resources strategy</li> <li>Business Continuity Management (BCM) framework</li> </ul>



### 2. Resilience concept

#### 2.1 Resilience vs Reliability

The concepts of resilience and reliability are related and interdependent, summarised below.



**Reliability** is focused on average network performance and seeks to minimise outage time <u>during normal conditions, including planned outages</u>. Reliability is typically measured in normalised outages per customer, or normalised average duration of outages per customer.



**Resilience** is focused on average network performance and seeks to minimise outage time <u>during major events</u>, such as natural hazards and extreme weather, and looks to improve the network's ability to withstand such events. Resilience is typically measured in unnormalised outages per customer, or unnormalised average duration of outages per customer. This is the actual network performance experienced by the customer on Endeavour Energy's network.

Improving network resilience will likely improve the network reliability when considering overall average performance (i.e. unnormalised SAIDI), but the reverse is not true; a network could dramatically increase its reliability with no, or little, improvement on its resilience to major events.

#### 2.2 Historical Context

In Endeavour Energy's pursuit of achieving the National Electricity Objective of maintaining quality, reliability, safety and security of supply, Endeavour Energy has been able to achieve a level of resilience in the past, however the approach was largely ad hoc and reactive. When disruptive events have occurred, Endeavour Energy has tailored its investment to ensure the minimisation of potential repeated future events for its customers.

#### 2.2.1 Catalyst for change

The risk presented by climate change has been an increasing threat to Endeavour Energy's ability to deliver consistent electrical network supply due to the impact on network assets exposed to extreme environmental conditions. The increasing frequency and severity of major weather events will lead to longer and more frequent outages if mitigation measures are not developed and implemented. These outages directly, and indirectly impact individual households and businesses financially and emotionally, in a society that is increasingly reliant on electricity.

Endeavour Energy's recent experiences with the Christmas 2018 windstorm, the 2019/2020 Black Summer Bushfires, the Hawkesbury-Nepean March 2021 Floods, and the multiple Hawkesbury-Nepean Floods in 2022, have reinforced for our customers the need to investigate additional mitigation measures.

These events were the catalyst for the development of this strategy, to ensure Endeavour Energy is focusing on reducing the impact of major disruptive events for the community while maintaining its business-as-usual performance. It is during these major events that the community is most dependent on electricity (eg: for warmth, telecoms, fuel and so on). The strategy will drive development of the plans and methods required to meet Endeavour Energy's strategic resilience goals.



#### 2.3 Business Context

#### 2.3.1 Organisational approach to climate change

This strategy forms one part of Endeavour Energy's overall approach to climate change, specifically considering the impact of increasing extreme weather events on network performance and communities. Endeavour Energy's overall approach to climate change is summarised in Figure 1, with relevant strategies defined below.

Sustainability / Net-Zero Strategy:	Defines how Endeavour Energy will reduce its own contribution to sustainability and climate change, such as being waste neutral by 2030, and climate positive by 2040.
Human resources strategy:	Defines how Endeavour Energy's workforce will be more resilient to climate related disruptions to ensure it is able to respond to major weather events. It considers aspects such as working conditions, working hours, employee capacity and capability (ie. diversity of skills and availability).
Resilience strategy:	The resilience strategy (this document) defines Endeavour Energy's goals to ensure network assets and communities are resilient to

major weather events.



Figure 1 - Overall approach to climate change



#### 2.3.2 Network Business strategy

The resilience strategy is considered an Enterprise Strategy informing investments that are driven by the Asset Investment Strategies, and collectively through the Network Business Strategy as shown in Figure 2. While improving network resilience will result in improvements across safety and reliability, the core driver for Endeavour Energy is achieving customer service expectations.



Figure 2- Network Resilience relationship to the Network Business Strategy

#### 2.3.3 Resilience documentation

This strategy sets the goals for the three levels of resilience documentation defined in Figure 3, which together form Endeavour Energy's short to medium term approach to resilience.



Figure 3 - Resilience documentation structure



### 3. Resilience Vision and Goals

#### 3.1 Resilience Vision

Endeavour Energy's vision for its Resilience approach is defined as:

To deliver both the electrical network performance and community support, during and after major climate events, in line with our customers' expectations

To achieve this vision, Endeavour Energy's strategic resilience goals are to:



These goals are closely interrelated, with customers forming a key part of the definition and selection of investments, based on the defined climate change risks.

#### 3.2 Goal 1 – Define and predict the risk of climate change

The trends and causes of climate change at a macro level are well understood. However, the climate risks and associated impacts to electricity networks are dependent on the local factors of an area. Endeavour Energy plans, builds, operates, and maintains an electricity distribution network that connects 2.6 million people to power, across Sydney's Greater West, the Blue Mountains, the Southern Highlands, Illawarra, and the South Coast of New South Wales. With a network covering different geographic areas, while supporting different and diverse communities, the risks to the network associated with each of these areas can be quite varied.

To be able to constructively start customer consultation, the second goal of this strategy, the risk to the network needs to be understood and quantified. The plan outlined in Figure 4 details the approach, which includes defining how extreme weather events have historically affected the network (and its customers) in terms of frequency and scale of impact, as well as predicting the potential future expected probability, and impact, of an extreme weather event occurring, and the associated likelihood that the impact results in network interruption.





Figure 4 – Plan for climate change risks



## 3.3 Goal 2 – Enhance customer experience through support, education, regular engagement and improved electrical network resilience

Endeavour Energy recognises the value and importance of reliable electrical networks and the impact loss of supply events can have on the customers they serve. To achieve this goal with customers, Endeavour Energy will:

- 1. Be open and transparent;
- 2. Communicate clearly;
- 3. Commit to supporting customers before, during and after a loss of supply event; and,
- 4. Collaborate with and learn from its customers.

Customer engagement is a continuous process, embedded in both Endeavour Energy's business as usual activities and defined planning cycles. Endeavour Energy ensures customers are fully informed of investment options and the associated implications, collaborating throughout to help guide Endeavour Energy's investment direction in resilience.

As well as involving customers in decision making regrading resilience investment, it is important that Endeavour Energy ensures these investments result in an improved customer experience, such as reduced downtime or additional support during major disruptive events. This includes supporting customers, essential services, and emergency services during major events.

Endeavour Energy's engagement has been informed by *Endeavour Energy's Customer Value Framework* and the *AER Better Resets Handbook – Towards Consumer Centric Network Proposals Dec 2021*.

Endeavour Energy's approach to enhancing the customer experience, covers the following three main areas:

- 1. **Engagement**: Ensuring the customer is informed and involved during the development and ongoing improvement of our services for customers.
- 2. **Support**: As part of the community, Endeavour Energy is committed to helping the community, customers and other utilities where it can.



3. **Education**: Ensuring customers have the knowledge before, during and after an event about how they can reduce the possible impacts of these climate events on themselves and their communities.



#### 3.4 Goal 3 – Climate change resilience in investment planning

The concept of resilience is a factor applicable to both operating expenditure and capital investments, across AUGEX, REPEX and Future Grid capital investment pillars. To incorporate resilience into Endeavour Energy's case for investments it must be quantifiable and incorporated into Endeavour Energy's investment modelling methodology<sup>2</sup>. Endeavour Energy, in keeping with Goals 1 and 2, will also need to evaluate the optimum investment avenue. This includes balancing the economic and service level trade-off between using emergency operating expenditure to recover from major events, versus proactive investment in resilience to reduce the likelihood or consequence of major events, whilst also considering the impact investment has on customer's bills, as shown in Figure 5.



Figure 5: Balancing network resilience and price

The plan for this goal is outlined in Figure 6 below.



Figure 6 - Resilience Treatment Planning

<sup>&</sup>lt;sup>2</sup> Endeavour Energy 2022, Expenditure Forecasting Methodology 2025-29



### 4. Network Objectives

The following network objectives have been developed to achieve both the vision and the goals set out the in the preceding sections.

Table 2

Goal	Performance Measure	Performance Targets
Goal 1 - Define and predict the risk of climate change on	Partner with climate scientists to perform long term climate modelling analysis	Have projections out to 2090 for likely weather hazards under mutliple emissions scenarios
resilience	Perform histroical base-line analysis on network impacts from climate hazards	<ul> <li>Perform historical base-line analysis on wind, fires, heat and flooding events</li> </ul>
	5 year average of unnormalised SAIDI	<ul> <li>Performance is maintained or less than the perivous 5 year average of unnormalised SAIDI</li> </ul>
Goal 2 - Enhance customer experience through regular engagement and improved	Comparison of the average customer outage between previous and subsequent events	Outage duration is less than     previous climate event
electrical network resilience	Partner with customers and councils to develop silutions to best serve the community	<ul> <li>Proactively engage with customers</li> <li>Facilitate the develop of robust Local council's Resilience Plans, inforporateing loss of electrical supply events</li> </ul>
Goal 3 - Incorporate the concept of climate change resilience into investment	Use of calculated escalation factors into asset REPEX calculations	<ul> <li>Asset replacement calculations incorporating climate hazard escalation factors.</li> </ul>
planning	Use of Climate Economic Model to justify investment	<ul> <li>Economic model being used as BAU</li> </ul>



### **Annexure B – Definitions and Abbreviations**

Term	Description
Community Resilience	The ability of communities to withstand and recover from the impacts of natural disasters.
Major Event	A significant weather event which has the potential to impact the network sufficiently to result in a Major Event Day.
Major Event Day	Interruptions beyond the control of Endeavour Energy, or because they are not representative of a normal day in terms of reasonable network resource availability and go beyond a pre-defined threshold for organisational SAIDI.
RAB	Regulatory Asset Base
Resilience	The ability to anticipate, withstand, quickly recover and learn from disruptive events



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