Distribution Annual Planning Report

2025

December 2025

Endeavour Energy

POWER together

Disclaimer

Endeavour Energy is registered as a Distribution Network Service Provider. This Distribution Annual Planning Report (DAPR) has been prepared and published by Endeavour Energy under clause 5.13.2 of the National Electricity Rules. Its purpose is to notify Registered Participants and Interested Parties of the results of Endeavour Energy's distribution network annual planning review and it should only be used for that purpose.

This report is intended for general information only. Independent verification and assessment of the information in this report for its accuracy, completeness, reliability and suitability for purposes other than for general information should be undertaken prior to it being used for such purposes.

Accordingly, Endeavour Energy makes no representations or warranty as to the accuracy, reliability, completeness or suitability for any particular purpose of the information in this document. Persons reading or utilising this document acknowledge that Endeavour Energy and their employees, agents and consultants shall have no liability (including liability to any person by reason of negligence or negligent misstatement) for any statements, opinions, information or matter (expressed or implied) arising out of, contained in or derived from, or for any omissions from, the information in this document, except insofar as liability under any New South Wales and Commonwealth statute cannot be excluded.

Contact

For all enquiries regarding this Distribution Annual Planning Report and for making written submissions contact:

Endeavour Energy
The Enterprise Portfolio Management Office
GPO Box 811
Seven Hills NSW 1730
Email: consultation@endeavourenergy.com.au

Contents

Executive Summary		**5**
1.	**Introduction**	**7**
1.1	About Endeavour Energy	8
1.2	Endeavour Energy's Network	9
1.3	Operating Context	12
3.0	**Asset Management**	**20**
3.1	Asset Management Philosophy	20
3.2	Asset Management System	20
3.3	Investment Strategy	22
3.4	Investment Decision Making	22
3.5	Value Framework	23
3.6	Licence Conditions	23
3.7	Safety	23
4.0	**Planning Approach**	**24**
4.1	Annual Planning Review	24
4.2	Network Planning Process	24
4.3	Planning and Investing	26
4.4	Recent Changes to Planned Projects	28
5.0	**Network Performance**	**29**
5.1	Network Reliability Overview	29
5.2	Quality of Supply	32
6.0	**Demand Forecasts for the Forward Planning Period**	**33**
6.1	Forecasting Methodology Overview	34
6.2	Forecasting Approach	35
6.3	Forecast Input Information Sources	38
6.4	Assumptions Applied to Forecasts	38
6.5	Demand Forecast	40
6.6	Analysis and Explanation of Forecast Changes	41
7.0	**Planning Coordination**	**42**

7.1	Joint Planning with Transgrid	42
7.2	Joint Planning with Other DNSPs	46
7.3	Consideration of Non Network Alternatives in the Planning Process	46
8.0	**Identified Network Needs**	**49**
8.1	Definition of terms used in Network Needs	49
8.2	RIT-D Investigations	50
8.3	Projects That Do Not Meet the RIT-D Criteria	53
8.4	Future Network Needs	54
8.5	Impact on Transmission – Distribution Connection Points	56
8.6	Primary Distribution Feeders	56
8.7	Other Factors Impacting Network Needs and Solutions	56
8.8	Embedded Generation Connections	61
9.0	**Planned Investments and Evaluation**	**62**
9.1	Public Consultation for our Major Investments	62
9.2	Summary of Draft Project Assessment Reports	64
9.3	Summary of Final Project Assessment Reports	64
9.4	RIT-D Projects Completed or In Progress	65
9.5	RIT-D Projects with Public Consultation Completed	65
9.6	Active Non-Network Programs and Trials	66
9.7	Asset Replacements and Potential Regulatory Investment Tests	70
9.8	Urgent and Unforeseen Investments	77
9.9	Information Technology Investment	77
Appendices		**79**

Executive Summary

Endeavour Energy is a licenced Distribution Network Service Provider (DNSP) serving some of Australia's largest and fastest growing regional economies.

Endeavour Energy is responsible for the safe, affordable and reliable supply of electricity to more than 1.2 million customers or 2.7 million people in households and businesses across Sydney's Greater West, the Blue Mountains, Southern Highlands, Illawarra and the South Coast.

We are transforming the network as part of a broader shift toward a cleaner, greener, and lower-carbon energy future. This involves moving beyond the traditional 'poles and wires' model to a modern, flexible grid that is resilient and sustainable. Or key priorities include enabling multi-directional energy flows and integrating Distributed Energy Resources (DER) such as rooftop solar, batteries, smart meters, and electric vehicles into the network. Through investment in advanced technologies, we aim to ensure equitable access for all DER users and provide customers with greater control over how they use, store, and share energy.

Endeavour Energy operates within regulated and unregulated markets. It is subject to the National Electricity Law (NEL) and National Electricity Rules (NER) which regulate the National Electricity Market (NEM). Endeavour Energy is also subject to the statutory and other legal requirements applied to all businesses in NSW.

The distributor's licence conditions, including the network Reliability and Performance Licence Conditions are imposed by the NSW Minister for Energy. The Independent Pricing and Regulatory Tribunal (IPART - Electricity) is responsible for administering licensing within the energy industry and monitoring compliance with licence requirements on request from the Minister of Energy. The Australian Energy Regulator (AER) ultimately determines Endeavour Energy's network revenue and network service pricing within each regulatory control period.

This Distribution Annual Planning Report (DAPR) complies with the NER clause 5.13.2. It reflects the outcomes of the annual planning review of Endeavour Energy's network. Information required for the DAPR is located within this document and the DAPR mapping portal available on https://dapr.endeavourenergy.com.au. The aim of the document and the portal is to inform network participants and stakeholder groups of the proposed development of Endeavour Energy's network, including potential opportunities for non-network solutions and possible investments where the Regulatory Investment Test for Distribution (RIT-D) applies.

Endeavour Energy delivers its asset management strategy through an ISO 55001-compliant Asset Management System supported by governance frameworks that align corporate, network, and asset objectives. Distribution network strategy and plans are developed in accordance with the asset management philosophy to achieve the corporate objectives. They are directed and coordinated and through the operation of the Asset Management Committee and the Investment Management Committee.

This DAPR is based on Endeavour Energy's planning processes in accordance with its asset management strategy.

Key features of our approach to asset management planning outcomes are:

- Continued strategic focus on asset renewal, prioritised and optimised on the basis of asset condition and network risk, and integrated with growth-related investment needs;
- Demand growth, primarily concentrated in North-West and South-West Sydney, where the NSW Government forecasts approximately 96,000 new homes by 2029 and supports a combined population increase of over 600,000 residents by 2041, for which Endeavour Energy is planning to provide up-stream supply infrastructure;
- Joint planning with Transgrid for the provision of supply for the proposed Western Sydney Aerotropolis at Kemps Creek;

- Continued implementation of demand management strategies and Distributed Energy Resources (DER) integration to defer planned network augmentations where it is economically feasible and practicable to do so;
- Management of reliability performance levels with targeted reliability improvement works where justified to meet licence condition obligations;
- A portfolio of 8 network-need driven projects in the next five years that require the application of the RIT-D, including consideration of non-network solutions;
- A further 23 projects where the estimated constraint date is forecast within the next five to ten years that will likely require application of RIT-D based on our current assessment;
- The identification of 104 high-voltage distribution feeders that are currently at or above maximum planned loading level, that require monitoring, remediation through augmentation, load transfers or load reductions, or combination of responses; and
- Ongoing growth in the connection of embedded solar-photovoltaic (PV) energy generation and battery storage and the integration of these and other emerging end-use demand management technologies with Endeavour Energy's network.

This DAPR provides the market with an understanding of the various investment programs and projects being undertaken by Endeavour Energy to fulfil its obligation as a licensed DNSP in the NEM. It provides a snapshot of the investment expected over the next five-year period. The details contained in this report will change over time as the consideration of new information in the planning process continues to inform planning outcomes in accordance with Endeavour Energy's corporate objectives.

Endeavour Energy recognises the significant role that customers and stakeholders play in shaping the network of tomorrow and we value their insights and feedback. Our Peak Customer and Stakeholder Committee play an important role in helping to inform the plans set out in this report and we thank them for their valuable contributions.

1. Introduction

Endeavour Energy serves some of Australia's largest and fastest growing regional economies. We own, develop, operate and maintain electricity distribution assets in NSW, and is subject to the National Electricity Law (NEL) and National Electricity Rules (NER) administered by the Australian Energy Regulator (AER).

The NER require all registered DNSPs to:

- Conduct an annual planning review and publish a Distribution Annual Planning Report (DAPR);
- Conduct economic assessments of potential project options under the Regulatory Investment Test for Distribution (RIT-D); and
- Implement a Demand Side Engagement Strategy to consult with and engage non-network providers in the development and evaluation of potential solutions to identified network needs.

The annual planning review covers all Endeavour Energy assets and activities that materially affect network performance, including replacement, refurbishment, and negotiated services. Its purpose is to develop long-term asset management plans in the interests of customers and to identify emerging issues, risks and opportunities, so they can be addressed proactively. This DAPR presents the outcomes of Endeavour Energy's 2025 review.

Endeavour Energy is required to prepare and publish a DAPR that complies with the requirements of the NER Schedule 5.8 Distribution Annual Reporting Requirements to:

- Provide transparency of Endeavour Energy's decision-making processes and provide a level playing field for all stakeholders in the national electricity market in terms of attracting investment and promoting efficient decisions;
- Include information associated with all parts of the planning process including forecasting demand, identification of network needs and the development of credible options to address network limitations;
- To give third parties the opportunity to offer alternative proposals to alleviate constraints. These proposals may include non-network options such as demand management or embedded generation solutions;
- Set out the results of Endeavour Energy's annual planning review, including joint planning, covering a minimum five year forward planning period for distribution assets;
- Inform registered participants and interested parties of the annual planning review outcomes including asset retirement and network capacity needs for sub-transmission lines, zone substations and transmission-distribution connection points and any primary distribution feeder capacity needs that exist or are expected to emerge within the next two years;
- Provide information on Endeavour Energy's demand management activities and actions taken to promote non-network initiatives each year including plans for demand management and embedded generation over the forward planning period; and
- Assist non-network providers, TNSPs, other DNSPs and connection applicants to make efficient investment decisions.

The publication of this DAPR comes at a time of unprecedented transformation in the energy system. Electrification, large-scale renewable integration, and the rapid uptake of Consumer Energy Resources (CER) are reshaping demand patterns and introducing new operational complexities. These changes require planning approaches that go beyond individual networks and consider how local decisions interact with broader system needs.

Endeavour Energy aims to embed collaborative and forward-looking principles into its planning processes. We are working closely with other NSW DNSPs and stakeholders to align methodologies, share data, and identify opportunities for efficient investment that deliver shared benefits for customers and the system. This includes:

- Joint planning for sub-transmission assets to optimise infrastructure development and avoid duplication;
- Coordinated demand forecasting that reflects electrification, CER uptake, and emerging large-scale loads such as data centres;
- Identification of strategic investment opportunities that unlock latent capacity and enable cost-effective integration of renewables and storage.

These efforts are informed by the recently published NSW Distribution System Plan (DSP) Opportunities Report,[1] a landmark, Australia-first study developed collaboratively by Ausgrid, Endeavour Energy, and Essential Energy. The report demonstrates how distribution-level opportunities can be integrated into whole-of-system planning and complements AEMO's Integrated System Plan (ISP) by providing a bottom-up perspective based on granular network and customer data.

By drawing on collaborative principles and insights from broader planning initiatives, this DAPR seeks to achieve its core objectives: providing transparency, supporting efficient investment decisions, and enabling timely, cost-effective solutions for customers. It aims to ensure Endeavour Energy's network remains reliable, affordable, and capable of meeting future demand in a rapidly changing energy landscape while aligning with state and national decarbonisation targets.

1.1 About Endeavour Energy

We power homes and businesses across our regions, including Greater Western Sydney, and support their economic growth and liveable urban development. Our focus is to deliver affordable, safe, resilient, sustainable, and reliable electricity to 2.7 million people today, growing to 3.0 million by 2029.Endeavour Energy plans, builds, operates and maintains the poles and wires and other distribution assets to provide an affordable, safe and reliable power supply to and from households and businesses across Sydney's Greater West, the Blue Mountains, Southern Highlands, the Illawarra and the South Coast.

The timely and efficient provision of these services is fundamental to supporting employment growth, economic development and housing affordability across one of the fastest growing metropolitan and regional economies in Australia.

Our network services communities with some of the highest cultural and language diversity in Australia across the lands of the traditional custodians – the people of the Dharawal, Dharug, Gundungarra, Wiradjuri and Yuin nations. We recognise first peoples' continuing connection to Country, cultures and community. We pay our respect to elders past and present.

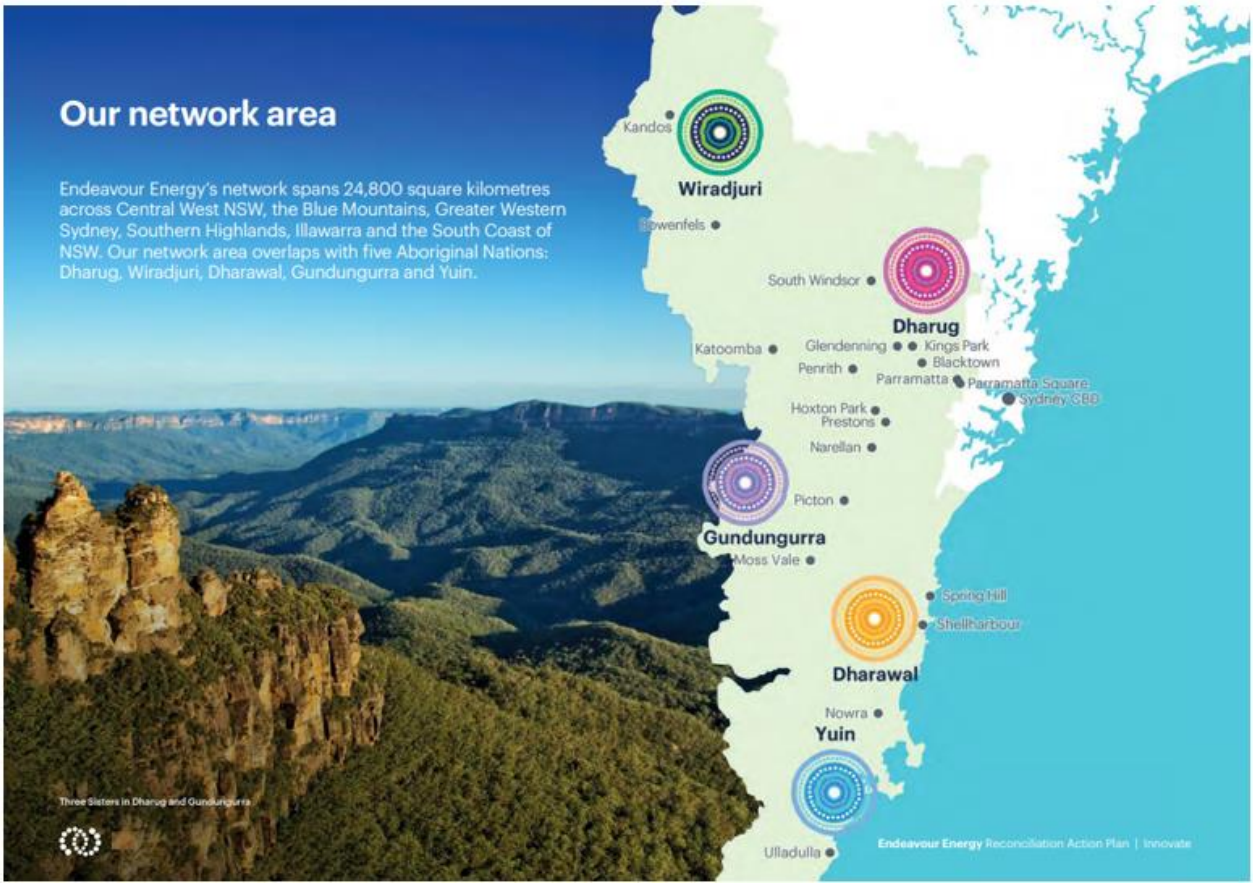
Over the next 20 years, these areas will be home to communities similar in size to Canberra. The population of Western Sydney is expected to increase by 1,000,000 by 2036 and we expect more than 20,000 new customers will connect to the network each year.

[1] See https://www.nsw-dsp.com.au/.

With change comes the opportunity for accelerated technological adaption, and so we welcome partnerships with government, universities and energy innovators to find new ways to optimise the use of network services to unlock value for customers.

Endeavour Energy is 50.4 percent owned by an Australian-led consortium of long-term investors in the private sector operating the network under a 99-year lease. The private sector consortium comprises of funds and clients managed by Australia's Macquarie Infrastructure and Real Assets, Canada's British Columbia Investment Management Corporation and Qatar Investment Authority. The remaining 49.6 percent is held by the State of NSW via a corporation constituted under the *Electricity Retained Interest Corporations Act 2015*.

Figure 1: Endeavour Energy's network area



1.2 Endeavour Energy's Network

In 2024/25, Endeavour Energy's network supplied 18,306 GWh of electricity to 1,134,647 network-connected customers. Endeavour Energy's distribution area is shown in **Figure 1**.

The bulk of Endeavour Energy's supply of electricity from traditional sources is taken from the generation source through Transgrid's transmission network at 132kV and 66kV. When the energy is transferred into Endeavour Energy's network, the voltage is transformed through 39 sub-transmission and 173 zone substations and distributed to customers through a 22kV, 11kV or 12.7kV high voltage network. Endeavour Energy also has switching substations to provide important connectivity across the network to enhance supply reliability and resilience and also improve operational flexibility. Distribution substations further reduce the voltage to supply customers with a 230V nominal low voltage supply in accordance with Australian Standards. Increasingly, Endeavour Energy's network is accommodating the rapid uptake of residential and industrial scale solar generation, and embedded customer, community and industrial batteries, microgrids, virtual power plants and electric vehicle charging infrastructure.

Table 1: Endeavour Energy network statistics as of 30 June 2025

Statistic	Number
Distribution Customer Numbers (total)	**1,195,533**
Network Aggregate Summer 2024/25 Demand Peak (MW)	**4042**
Energy Distributed to Year End (Residential) (GWh)	**6,094**
Energy Distributed to Year End (Non-Residential Including un-metered supplies) (GWh)	**12,212**
Energy Distributed to Year End (GWh)	**18,306**
System Losses (%)	**4.2**
Sub-Transmission Substation and Switching Station (Number)	**39**
Zone Substation (Number)	**174**
Bulk Supply Point (Number)	**15**
Distribution Substation (Number)	**35,271**
Sub-Transmission Overhead (km)	**3,017**
Sub-Transmission Underground (km)	**429**
High Voltage Overhead (km)	**11,206**
High Voltage Underground (km)	**6,019**
Low Voltage Overhead (km)	**8,609**
Low Voltage Underground (km)	**11,174**

Historically, our network was designed for one-way energy flows, delivering electricity from generators to customers. Today, it is rapidly transforming in a dynamic, multidirectional grid which integrates Distributed Energy Resources (DERs), enabling customers to export excess generation back into the network.

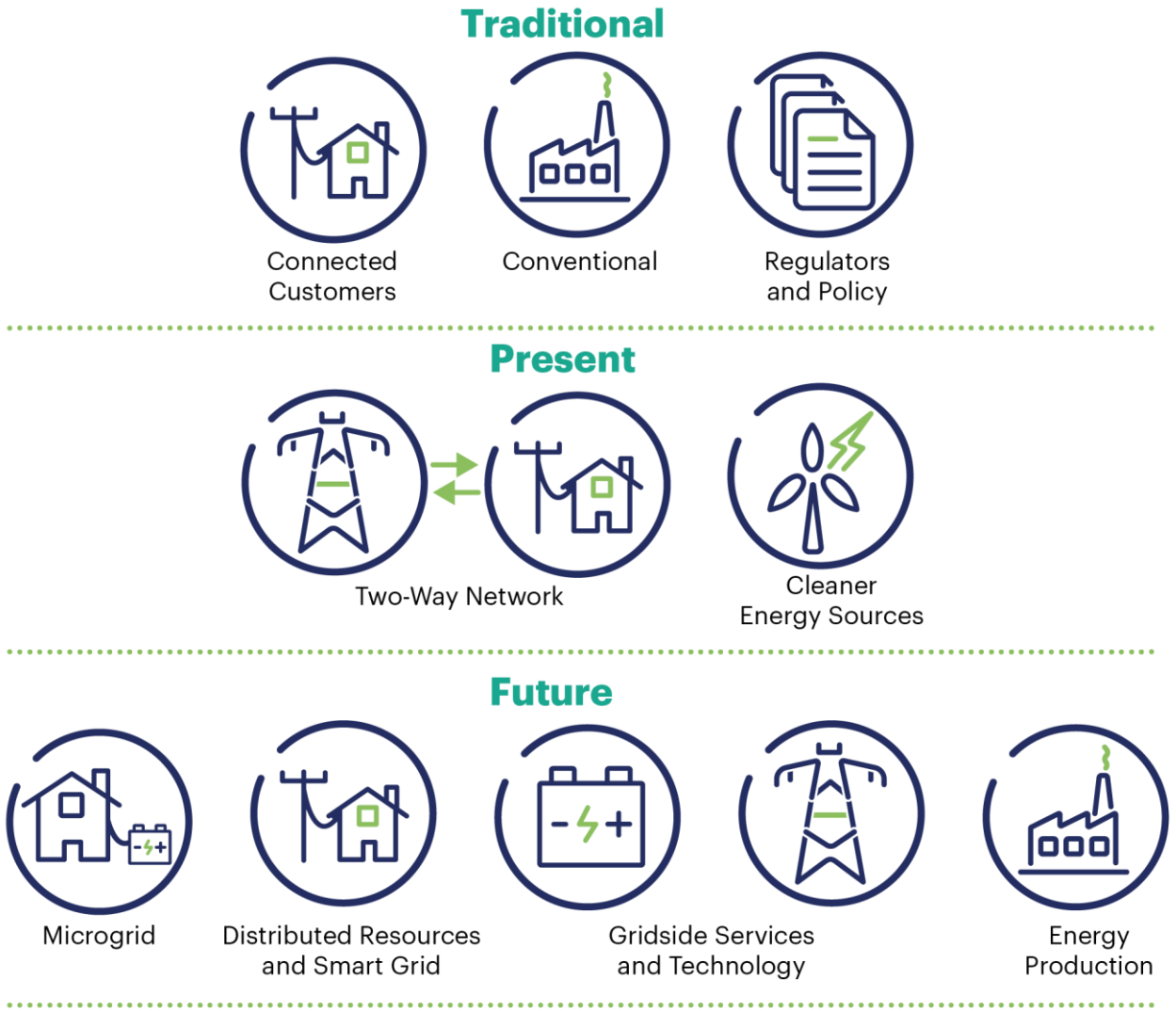
The uptake of rooftop solar has been unprecedented, growing from 24,430 systems in 2010 to over 327,000 today, driven primarily by residential adoption and increasingly supported by large commercial and industrial installations across Western Sydney.

Local councils are also driving demand for community batteries, EV charging stations, smart street lighting, solar gardens, and microgrids to future-proof communities, strengthen climate resilience, and support the transition to clean energy. These changes require us to embed these initiatives into our planning and strategy, ensuring we deliver the projects and capabilities needed for the network of tomorrow.

Figure 2 demonstrates the technological changes in our network which pose both significant opportunities as well as challenges for Endeavour Energy to manage the safe, affordable and reliable integration of all these distributed energy resources in the network.

When effectively managed, solar and storage systems can work together to strengthen grid reliability and flexibility, reducing reliance on traditional poles-and-wires infrastructure and supporting a secure, resilient energy supply, while also helping keep costs manageable for customers.

Figure 2: Electricity Network Transformation - past, present and future



To help plan for these changes in the early 2020s and beyond, Energy Networks Australia invited customer advocates and energy industry stakeholders to help the CSIRO map out a plan called the Electricity Network Transformation Roadmap.

Endeavour Energy's leadership chaired the group that designed the Roadmap and is committed to its implementation. More recently, the NSW Government has consulted with Endeavour Energy to ensure the smooth implementation of the NSW Government's Electricity Infrastructure Roadmap, which will see the development five renewable energy zones across NSW, with one in the Illawarra region.

These changes and the transformation of the energy system will allow consumers to benefit from rapidly changing technologies in the power system; unlock the value of flexible demand and distributed energy resources; and provide clear signals for timely and efficient investment to deliver reliable, secure, and affordable electricity for consumers.

1.3 Operating Context

Regulatory framework

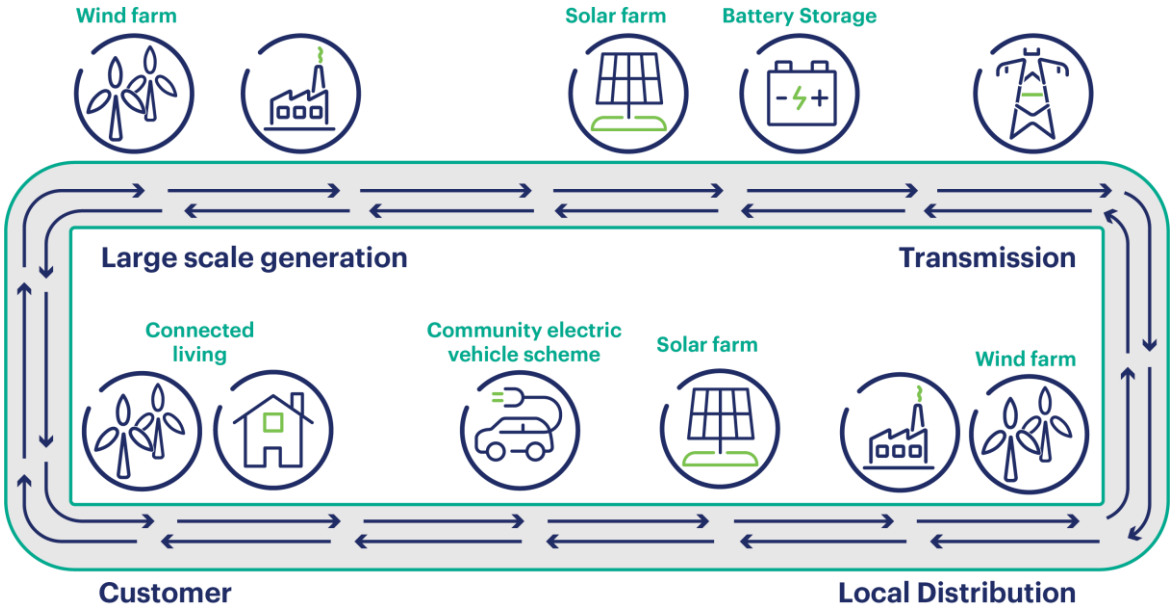
Endeavour Energy is regulated by statutory and legislative requirements including work, health & safety (WH&S), environmental, competition, industrial, consumer protection and information laws, the NEL, the NER, the NSW Electricity Supply Act 1995 and the requirements of its NSW Distribution Network Service Provider licence. Endeavour Energy complies with these laws and regulations through its internal policies, procedures, workplace instructions and industry codes and standards. We operate a common business control framework across these various instruments that allows us to fulfil our obligations through the development and implementation of plans, delegations of authority and associated controls, instruction and training, audits of compliance, and risk identification and management.

In particular, Endeavour Energy's operations are guided by several important policies and codes, including a Code of Conduct, a Stakeholder Engagement Framework, our Safety Policy, Environmental Code of Conduct and our Statement of Business Ethics.

Endeavour Energy is managed by a Board of Directors and a Chief Executive Officer (CEO). Endeavour Energy's CEO reports to the Board. The Board is responsible for setting the overall strategic direction and performance targets and monitoring the implementation of the strategy by the organisation. The CEO leads the Executive Leadership Team in delivering the approved strategy and achieving the performance targets set by the Board.

Within NSW, the Network Reliability and Performance Licence Conditions are imposed by the Minister of Energy. The Independent Pricing and Regulatory Tribunal (IPART - Electricity) is responsible for administering licensing within the energy industry and monitoring compliance with licence requirements on request from the Minister. Safety performance and compliance is also administered by IPART in conjunction with WorkCover NSW. The AER is the economic regulator of the distribution and transmission sectors of the NEM under the NEL and NER.

Figure 3: Electricity Industry Structure



Building, operating and maintaining a distribution network of this scale and complexity involves significant costs. Our core responsibilities include:

- Maintaining safety and reliability by inspecting and servicing distribution lines, substations, and associated equipment.
- Building new infrastructure such as substations, poles, and wires to support growth in new suburbs and meet rising demand.
- Responding to emergencies like storms and extreme weather events that damage power lines and poles.
- Vegetation management to maintain safety clearances, reduce bushfire risk, and prevent outages caused by falling trees.
- Connecting new customers to the network and upgrading existing connections.
- Exploring non-network solutions by researching, trialling, and installing technologies like batteries to reduce reliance on traditional poles-and-wires upgrades.
- Providing customer-requested services such as meter testing, off-peak conversion, and design certification on a user-pays basis.
- Installing and maintaining public lighting across our service area.

Key trends

There are key trends shaping our current and future operational landscape. These are:

- **Decarbonisation and Clean Energy Transition:** The energy sector is undergoing transformation driven by the imperative to decarbonise. Government targets and customer expectations are accelerating the shift to clean energy. Renewable generation is increasing significantly, supported by distributed energy resources such as rooftop solar and battery storage. Large-scale renewable projects and Distribution Renewable Energy Zones (DREZs) will also play a pivotal role in addressing this transformation, requiring coordinated investment and innovative grid solutions to integrate variable generation sources seamlessly.
- **Electrification of Transport and Homes:** Electrification is reshaping demand patterns as households and businesses transition from gas to electricity and adopt electric vehicles (EVs), driving significant changes in consumption and load profiles. This trend presents opportunities to increase energy utilisation and support decarbonisation, but it also introduces challenges in managing peak loads and maintaining affordability. Smart tariffs, flexible charging, and orchestration of distributed energy resources will be essential to maintain affordability and reliability while supporting this transition.
- **Customer-centric Network:** Customers are gradually playing a more active role in the energy system, moving beyond consumption to adopt practices such as generating and storing energy and engaging in flexible usage through options like time-of-use tariffs and smart EV charging. The widespread adoption of rooftop solar, batteries, and smart meters creates opportunities to unlock grid flexibility through customer engagement. Initiatives such as flexible exports and incentive programs will enable orchestration of distributed resources, ensuring that customers benefit from lower costs while contributing to system stability. Building trust and providing clear, actionable information will be critical to achieving these outcomes.
- **Climate Resilience and Extreme Weather Events:** Climate modelling indicates that extreme weather events will become more frequent and severe, increasing the risk of damage to infrastructure and compromising the reliability of electricity supply. Building resilience into network planning and operations is essential to mitigate these impacts and ensure continuity of service.
- **Digitisation and Emerging Technologies:** Digitisation is transforming how networks are operated and maintained. Advanced analytics, automation, and artificial intelligence will enable real-time optimisation of grid performance and predictive asset management. As digital integration across the network expands, cybersecurity will become a critical priority to safeguard systems and customer data. Embracing digital technologies will deliver efficiency gains and unlock new capabilities for managing complexity in a decentralised energy system.
- **Ageing Infrastructure:** There is a growing need to maintain the health of ageing assets and increase replacement for those that pose material risks to safety and reliability. Traditional approaches will not be sufficient; investment in modern, data-driven strategies such as predictive maintenance, condition monitoring and digital twins will be essential to optimise lifecycle costs, improve reliability and enable smarter decisions.
- **Communities and economic growth:** Urban expansion and housing targets, particularly in Western Sydney and growth corridors such as the Aerotropolis, will drive significant network augmentation. High-density developments and electrification trends will require integration of smart grid technologies to manage demand and maintain reliability. Strategic planning will ensure that infrastructure keeps pace with population growth while supporting sustainability objectives.
- **Dedicated Infrastructure for Emerging Industrial Loads:** Industrial growth, including large-scale connections for data centres and hydrogen production facilities, will reshape demand profiles and require large and potentially dedicated assets. These high-demand customers present opportunities to

leverage economies of scale and deliver tailored solutions that optimise network efficiency. Targeted engagement and investment will ensure the network is equipped to support emerging industrial loads and enable broader economic development

- **Building a Resilient and Sustainable Network:** Sustainability considerations will increasingly influence how the network is planned, built and operated. This means adopting approaches that minimise environmental impact, improve resource efficiency and strengthen resilience to climate risks. Key actions include integrating circular economy principles into asset lifecycle management, reducing waste, and ensuring transparent decision-making that reflects community expectations. Embedding sustainability into network design and investment will help maintain social licence, support decarbonisation goals and deliver long-term value.
- **Investment Efficiency and Flexibility:** The pace of technological innovation and shifting consumption trends necessitate flexibility in investment planning. A "flex-first" philosophy prioritises optimisation of existing assets before committing to new infrastructure, supported by scenario planning and portfolio analysis. This approach balances affordability, reliability, and sustainability, ensuring that capital investment is deployed efficiently.

Our Customers

We serve a diverse population with over 2.7 million customers across 24,980 square kilometres. Most of our customers are households and small to medium businesses located in urban and developing rural areas. We also serve large urban areas, medical precincts and manufacturing and industrial customers who have specific needs for a safe and reliable supply, and we provide high voltage support directly to very large businesses.

Our network includes significant development areas such as the Western Parkland City and the Western Sydney International (Nancy-Bird Walton) Airport and its surrounding Aerotropolis. It's also home to Sydney's North-West, South-West and Greater Macarthur Priority Growth sectors, planned to deliver thousands of new homes and create communities of metropolitan scale. To support this growth, NSW is committed under the National Housing Accord to deliver 377,000 new well-located homes by 2029, with a significant share concentrated in Western Sydney.

In addition to population growth, our residential customers have the third highest energy density and demand density in the NEM[2]. This means that our customers consume a relatively high amount of energy, particularly during peak times (4pm to 8pm). This is largely due to a combination of higher summer temperatures (often up to 10 degrees higher than the Sydney CBD) and energy-intensive economic activity.

As the electricity industry undergoes rapid transformation, many customers are changing the way they interact with the network, and we are seeing more small-scale renewable forms of generation connecting to the network. By December 2025, approximately 330,000 customers had connected their own small scale renewable generation (mostly solar panels) to the network, representing a cumulative capacity of around 2.6GW. Our network will continue to play a critical role in enabling a range of customer benefits from the increasing uptake of distributed energy resources (DER). In Chapter 4, we provide more detail on the way our customers consume and produce energy is evolving.

[2] NEM - National Electricity Market: The NEM is both a wholesale electricity market and the physical power system operating in New South Wales, the Australian Capital Territory, Queensland, South Australia, Victoria and Tasmania (AEMO | National Electricity Market (NEM))

Endeavour Energy is a signatory to the Energy Charter, an industry and customer led, world-first, whole-of-sector initiative to address customer expectations. Endeavour Energy works to deliver the five principles of the Energy Charter:

1. We will put customers at the centre of our business and the energy system
2. We will improve energy affordability for customers
3. We will provide energy safely, sustainably and reliably
4. We will improve the customer experience
5. We will support customers facing vulnerable circumstances

Our Regions

We manage our operations over three distinct geographic regions:

NORTHERN REGION (NORTH-WEST SYDNEY AND BLUE MOUNTAINS – WIRADJURI AND DHARUG NATIONS)

The majority of our customers (and our network infrastructure and assets) are located in Greater Western Sydney which includes the major cities of Parramatta, Blacktown, Penrith, along with the Hawkesbury and the Hills regions located in the Northern region. Combined with other major centres in the Central region, they form the third largest economy in Australia.

Typical of urban expansion, greenfield development within Sydney is largely confined to regions on the city fringe. This suburban development has been primarily driven by the largest coordinated land release in the history of NSW. Development to accommodate this expansion has been concentrated in the North-West and South-West Sydney regions which are entirely captured by our network area. With half of Sydney's population expected to reside within Sydney's west within the next 15 years, our investment plans for the next regulatory period support required growth in these areas.

We also supply customers throughout the Blue Mountains and beyond. This is a World Heritage Area featuring dense vegetation with challenging topography. Managing bushfire risk and reliability is a key focus for this part of our network.

CENTRAL REGION (SOUTH-WEST SYDNEY AND SOUTHERN HIGHLANDS –GUNDUNGURRA, DHARUG AND DHARAWAL NATIONS)

The central area of our network incorporates the major urban centres of Liverpool, Fairfield and Campbelltown. In common with the Northern region, strong greenfield growth has been experienced in areas that were previously low-density rural communities. Large transport infrastructure investments underpin population and economic growth in the area.

This area is also home to Sydney's second international airport at Badgerys Creek, featuring development of an 'aerotropolis'. Set to open in late 2026, we are working closely with planning authorities and developers to support this and other planned development in the surrounding area.

South-west of the Sydney metropolitan region, the rural townships of Picton, Bowral, Mittagong and Moss Vale form the major regional communities of the Southern Highlands.

SOUTHERN REGION (ILLAWARRA AND THE SOUTH COAST – DHARAWAL AND YUIN NATIONS)

Most of our resources in the Southern region are focused in Wollongong and the wider Shellharbour district. After Sydney and Newcastle, Wollongong is NSW's third largest city and is home to approximately 300,000 people. Significant growth is planned for the region, led by the West Lake Illawarra area which will ultimately accommodate an estimated 38,000 new dwellings. This region includes Port Kembla Harbour and an industrial complex that is the largest single concentration of heavy industry in Australia.

The most southern areas of our network are predominantly small coastal communities, popular with holiday tourists and retirees, and often subject to severe weather events. Our growth story extends to this area too, with an estimated 5,000 new homes possibly in the greenfield Moss Vale Road Urban Release Area in the Shoalhaven region.

The challenges to providing a safe, reliable and affordable service are evolving as the NEM is impacted by decarbonisation, decentralised generation and changing energy consumption patterns. We must evolve to keep pace with these trends in order to meet the expectations of our customers into the future.

Western Sydney regional growth

NSW population industrial growth has focused on the urban expansion of Sydney's Greater West. This strategic expansion will drive the substantial and rapid growth of the region, at a rate nearly 40% higher than the rest of Metropolitan Sydney. By 2036, half of Sydney's population will reside within the city's west, centred around new 'satellite cities. Projections suggest the need for an additional 725,000 dwellings, in a region that is also planned to cater for a new airport, new industry, rejuvenation of manufacturing, and a science park. We will be part of building a new city, from scratch.

Endeavour Energy is responsible for the expansion of the distribution network to facilitate this growth and industry, and to support the NSW Government's planning and development of liveable, productive and sustainable communities that thrive. This focus has been a driver of our investment for several years and it will continue to be in the foreseeable future. To continue to accommodate this growth, new networks must be planned and delivered in a way that both facilitates this vision and futureproofs the network. For residents, small and large business and emerging needs such as datacentres and hydrogen hubs. This requires a focus on:

- **Planning for the future:** This predicted expansion of the asset base is occurring at the same time as the changing nature of the grid. Endeavour Energy will need to work with developers and government to ensure greenfield developments are future-proofed, efficient and remain cost-effective.
- **Ensuring network infrastructure is not a barrier to growth:** The roll-out of new infrastructure across Western Sydney will require significant investment, and the expansion cannot occur without this supporting infrastructure in place. Endeavour Energy will need to work with the Government to ensure the infrastructure expansion meets the growth of the of the community.

2.4 Purpose, Values & Strategy

At Endeavour Energy, our purpose and values form the basis of everything we do and how we do it.

Our purpose is to power communities for a brighter future.

Our vision is to lead the way with smarter energy solutions.

Our values underpin how we work and stretch us to lead.

Our five values are:

Be Safe
Put safety first. Care. Always.

Work Together
Listen. Share goals. Work together as one.

Find a Better Way
Stretch for excellence. Innovate. Challenge ourselves. Create value.

Adapt Quickly
Be nimble and flexible. Be open to learn. Embrace opportunities.

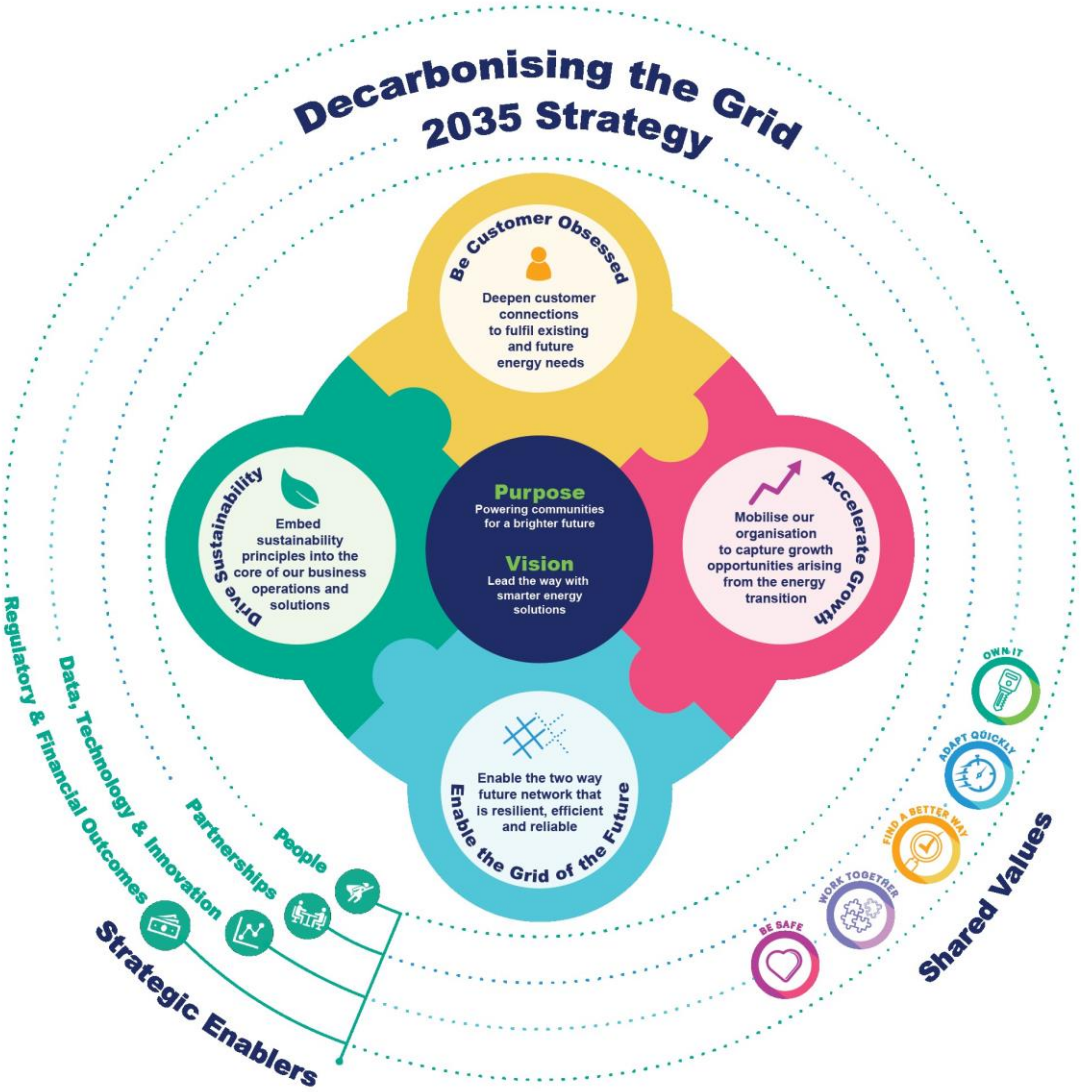
Own It
Do what you say and own the impact of what you do. See it through.

We are trusted and caring, authentic and down to earth. We are collaborative and connected, and sustainable at the core. We pull together to put our customers and community at the heart of everything we do. We make it easy for customers and our partners to do business with us, we drive innovations they need and value, and we empower our people to be their best and deliver excellence.

Endeavour Energy's Corporate Strategy

Endeavour Energy's strategy is to evolve its 130-plus years of electricity distribution network management capability to shape a modern, sustainable network which leads the way in developing new energy solutions for our customers and accelerates the decarbonisation of the grid.

Our Corporate strategy supports the principles of the Energy Charter and is designed to promote the long-term interests of our customers, shareholders, people and communities by focussing on four key strategic priority areas illustrated in the figure below.



3.0 Asset Management

3.1 Asset Management Philosophy

Endeavour Energy applies a lifecycle approach to managing its network and the assets that comprise it. The lifecycle approach involves two aspects:

- Considering individual assets and asset populations on a whole-of-life basis in order to achieve optimal outcomes across their entire lifecycle e.g. considering how the cost-benefit trade-off between asset management decisions made at the design and procurement stage may later impact the maintenance stage of the asset lifecycle; and
- Considering the network as a whole in all asset management decisions i.e. will the decision made in relation to any individual asset or asset population result in the best outcomes for the network.

We develop network and asset plans, proposed investment programs, develop asset standards and management policies, and strategically monitoring and manage network capability and performance.

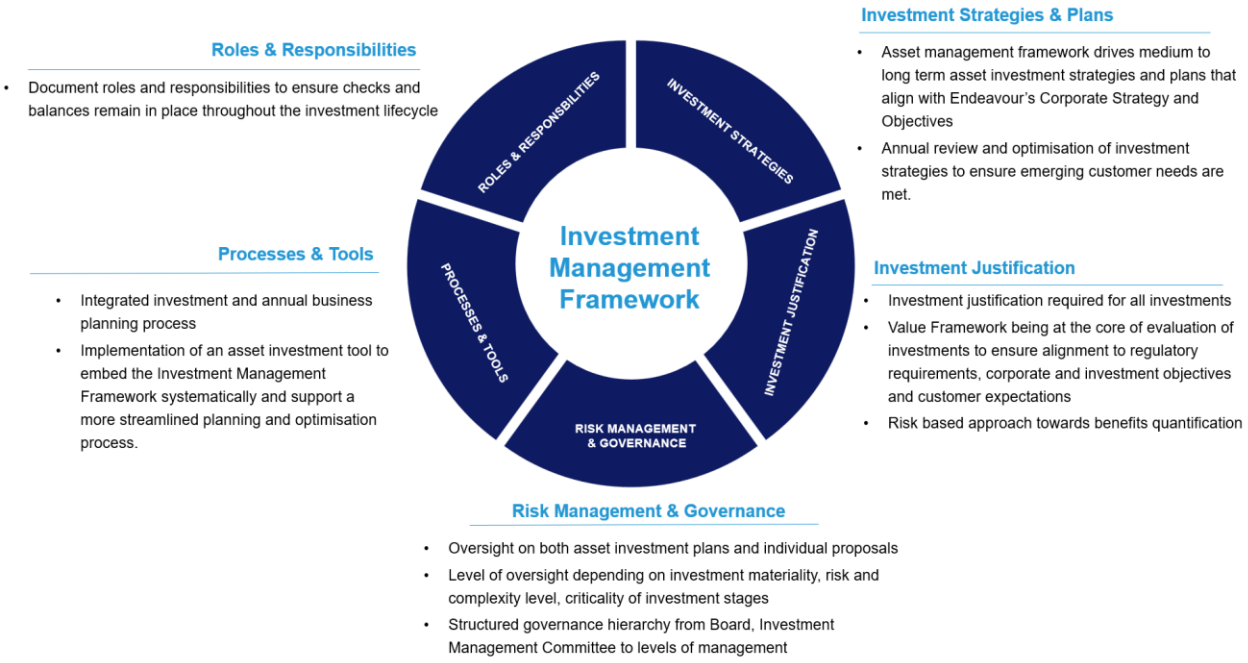
3.2 Asset Management System

Endeavour Energy maintains an Asset Management System that provides a framework that governs how the company manages its electricity distribution network and related assets throughout their entire lifecycle in accordance with ISO 55001. It ensures that planning, design, construction, operation, maintenance, and renewal activities are aligned with organisational objectives, regulatory standards, and customer expectations.

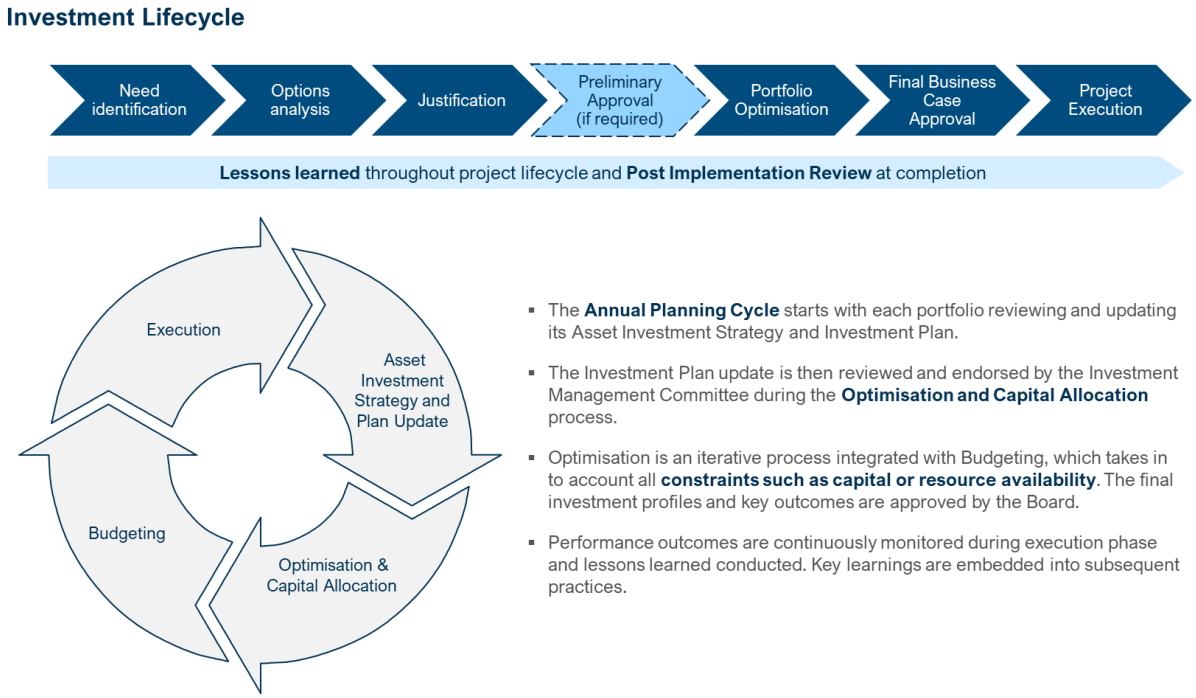
The Asset Management System plays a strategic role in shaping Endeavour Energy's long-term network plans and investment programs. It incorporates customer and stakeholder feedback, integrates digital tools for portfolio optimisation, and drives continuous improvement. Investment Management & Governance Framework

Endeavour Energy's Investment Management Framework has been revised to ensure best-in-class customer investment outcomes and business governance and to adopt our new digital transformation platforms. This includes risk-based approaches to economic benefits quantification and alternative options, risk and uncertainty management.

Figure 4: Investment Management Framework



An annual planning and investment cycle oversees key capital allocation from a management level for optimisation.



3.3 Investment Strategy

Our investment strategy is based on four priority themes that balance affordability for customers with their long-term interests.

The four themes are below:

A **Meeting core customer expectations for a safe, sustainable and reliable electricity supply:** We invest in the replacement and renewal of assets across our network to ensure they continue to meet our customers' expectations for a network that is safe for our workers and the community, provides a reliable electricity supply, remains affordable, and operates sustainably. Our strategy prioritises solutions that not only maintain safety and reliability but also minimise environmental impact, improve energy efficiency, and support the transition to a low-carbon future.

B **Supporting the sustainable growth of our communities;** As the ongoing transformation of Western Sydney and our regions continues to drive growth across the Endeavour Energy network, we need to align our investments with other lead infrastructure provisions by facilitating grid technologies that will be adaptable to the evolving needs of businesses and communities.

C **Providing a resilient network for the community adapting to changing climate and external hazards:** Endeavour Energy defines resilience as the ability to anticipate, withstand, quickly recover and learn from major disruptive events. As the effects of climate change become real, our infrastructure needs to meet our high levels of service in an increasingly challenging environment. Our organisation needs to be prepared, enabling our trained personnel to respond to incidents and provide support services to those in need.

D **Enabling customers' future energy choices;** As customers seek to connect more distributed energy resources and increasingly use sophisticated digital platforms, the network and its management must evolve. Our objective is to enable customers' future energy choices for a sustainable future, moving use towards the future integrated and low carbon energy system.

3.4 Investment Decision Making

Our investments are implemented through our Investment Decision-Making (IDM) process which aligns with our Investment Management Framework (IMF) and is a key driver of our Asset Management Framework (AMF). Individual plans in the key network investment areas are developed and supported by detailed analysis that explicitly considers:

- Externally imposed obligations and requirements including service standards, design standards, safety and environmental obligations, and specific asset performance targets;
- Information about the network system including loading, condition of assets, performance variability, current capacity, age and the criticality of key assets;
- Forecasts of demand growth and connections by location; and
- Inputs obtained from stakeholder engagements.

3.5 Value Framework

To optimise the mix of investments, we apply a consistent approach to quantify risks and benefits and determine the timing for investments based on the need and the best overall value provided by the portfolio. This framework ensures that decisions are transparent, repeatable, and aligned with our corporate objectives, including safety, reliability, affordability, and sustainability.

This is the basis of the value framework and is underpinned by:

- Using a rational economic approach to allow the comparison of dissimilar investments on a common basis
- Using a consistent and repeatable approach to assess all the benefits, risks, and cost of the investment, ensuring transparency and fairness in decision-making
- Ensuring that both financial and non-financial benefits are included, where their contributions are aligned to a common scale.
- Measuring its alignment to the organisation's corporate strategy and risk appetite, and
- Embedding sustainability and decarbonisation objectives into decision-making to ensure investments support long-term environmental outcomes. This includes considering emissions across operations and the supply chain so that our choices reduce overall carbon impact and enable a more sustainable energy network.

3.6 Licence Conditions

Our licence conditions have a material impact on our asset management framework and capex requirements. As the compliance regulator, IPART conducts frequent audits to demonstrate ongoing compliance with our obligations. These include:

- Distribution reliability and performance conditions: set overall reliability, individual feeder performance and customer service standards that we must comply.
- Critical infrastructure licence conditions: set out requirements regarding our management and operational presence in Australia and data security requirements including privacy of customer information.
- Management systems: our asset management system must be consistent with International Standard (ISO) 55001 and our environmental management system must be consistent with ISO 14001. Our safety management systems must also comply with Australian Standard (AS) 5577 in accordance with the NSW Electricity Supply (Safety and Network Management) Regulation 2014.

3.7 Safety

Continuing advances in workplace health and safety are driving a more integrated view of contributing factors to workplace safety and our obligation to ensure a safe place of work. In this regard, safety considerations including safety in design are overtly considered in asset management strategies. Furthermore, Endeavour Energy has a specific strategic plan for Safety and Environment that considers the broader safety and environmental initiatives across the business.

4.0 Planning Approach

4.1 Annual Planning Review

The NER requires that the annual planning review includes the planning for all assets and activities carried out by Endeavour Energy that would materially affect the performance of its network. This includes planning activities associated with the replacement and refurbishment of assets and negotiated services. The objective of the annual planning review is to identify possible future issues that could negatively affect the performance of the distribution network to enable DNSPs to plan for and adequately address such issues in an appropriate timeframe. This DAPR is the outcome of the annual planning review and summarises the findings of our planning review processes.

The DAPR provides an insight into the planning process as well as providing information to registered participants and interested parties regarding the nature and location of emerging constraints within Endeavour Energy's sub-transmission, 22kV and 11kV distribution network. The timely identification and publication of emerging network constraints provide an opportunity for the market to identify potential non-network solutions to address those constraints and allows Endeavour Energy to develop and implement appropriate and timely solutions.

4.2 Network Planning Process

Endeavour Energy operates in accordance with the legislative and regulatory framework applicable to electricity DNSPs in NSW.

The network planning and development process for the distribution network is increasingly shaped by extensive customer and stakeholder engagement and is carried out in accordance with the NER Chapter 5, Network Connection Access, Planning and Expansion.

Endeavour Energy carries out network planning at both a strategic and a project level. Endeavour Energy's investment governance process provides continuous review and ongoing assurance that the Company's capital investment is both prudent and efficient as well as being consistent with the longer-term strategic planning objectives.

Endeavour Energy's planning process is designed to identify the most efficient ways of ensuring the network business meets customer needs and network performance obligations. Endeavour Energy places emphasis on the planning and project identification stage, assessing our customers' short term and longer-term supply needs, and coordinating these with asset renewal requirements. We are then able to identify and select the optimal solution to meet those needs in a coordinated, risk-optimised way.

All credible options, including non-network alternatives, are considered in determining how to meet our network performance obligations and the objectives of the NEL. A robust selection process is implemented that explicitly trades off alternative expenditure options using quantified estimates of credible option costs and benefits to identify the optimum solution to address the identified need.

In accordance with NER obligations, network investment and non-network options are assessed impartially, using a consistent process for reviewing the costs of each option against the benefits they would deliver. Non-network solutions are evaluated for the extent to which they can facilitate the deferral of network investment or obviate it altogether. This allows various combinations of non-network solutions and deferred investment options to be assessed.

The first stage of the planning process involves gathering the data required to inform the investment process. This includes:

- Historical electricity demand data to establish actual consumption trends;
- Development of demand forecasts to predict future load requirements;
- Analysis of network capacity constraints to identify potential limitations;
- Evaluation of asset condition and performance metrics to determine operational health;
- Projection of new customer connection requirements to accommodate anticipated growth; and
- Review of relevant statutory and regulatory obligations to ensure compliance throughout the planning cycle.

The capability of the network is assessed against key criteria which include:

- Meeting statutory and regulatory requirements relating to the safe operation of the network and to environmental impact;
- Addressing capacity constraints to achieve a level of supply security commensurate with reasonable customer expectations;
- Reliability performance against the reliability performance standards set out in the Licence Conditions;
- Asset condition; and
- Customer connection requirements.

When emerging network limitations are identified, a range of credible options are developed to ensure that supply security is maintained at a level appropriate to maintain reliability of supply. Options considered include both network and non-network solutions. The costs of these options are compared against the risk and costs associated with the base case option of doing nothing.

A review including public consultation with interested stakeholders then selects the most economic option (or options). Each major investment is required to be consistent with Endeavour Energy's longer-term network plans and network standards as well with the National Electricity Objective (NEO).

This DAPR document forms part of public consultation and provides notification of the expected future network requirements. It also indicates the required timeframe to address these needs to allow for appropriate corrective network investment or non-network alternatives or modifications to connection facilities to be developed and undertaken. Providing visibility of network requirements prior to starting the RIT-D process allows for development of more mature non-network solutions.

Capital investment requirements in the distribution network are forecast in line with network needs and constraints across the network area.

The spatial demand forecast is a critical process which supports the planning and development of the forecast augmentation investment program. The forecasting process is carried out twice a year and is a critical input into the planning process to identify and understand the capacity needs of the network. The summer and winter loading conditions are analysed to provide understanding of the seasonal variations which are important for identifying optimal network solutions.

Losses are considered when comparing credible options. Endeavour Energy complies with RIT-D guidelines and assesses the cost of losses for each option where the losses are materially different between the options. An increase in network losses makes a negative contribution to the market benefits of a credible option, while a decrease in network losses makes a positive contribution.

4.2.1 Probabilistic Planning Approach

Endeavour Energy applies probabilistic planning techniques to assess supply security constraints. Deterministic (N-1) criteria are used only as a trigger for further investigation. The probabilistic planning approach includes:

- An assessment of the likelihood of failure of network elements;
- An assessment of the consequence in the failure event. This includes expected outage duration and expected unserved energy. The unserved energy can be monetised by applying a Value of Customer Reliability (VCR). Safety risks are also assessed and monetised by applying a value of statistical life (VSL);
- Consideration of back-up capacity at other voltage levels (for example HV distribution feeder capacity when analysing zone substation contingencies);
- A sensitivity analysis for key parameters such as load growth, cost, rate of return and discount rate; and
- A determination of economic timing for network augmentation and renewal and the net present value of options based on demand forecasts and the economic benefits provided by each option.

For greenfield residential development, probabilistic techniques tend to result in a staged approach to provision of supply capacity including the use of distribution feeders, single transformers and temporary and mobile substations being adopted.

4.3 Planning and Investing

Growth in Endeavour Energy's network is being driven principally by new customer connections arising from greenfield development across our regions, particularly across Sydney's north-west and south-west priority growth areas such as the Western Sydney Aerotropolis and Greater Macarthur. Augmenting the network to provide for the growth in demand in these areas at the right time is important to ensure that development can proceed and that significant infrastructure investment by the State Government in water, roads and rail in greenfield areas are not left stranded.

Endeavour Energy evaluates staged options for network augmentation and/or extension in response to developer requests for supply. Further augmentation is undertaken when load growth projections are realised. In some cases, the minimum viable solution may involve a temporary mobile substation that can be moved on to the next greenfield development when its capacity has been outgrown. As the cost and capability of emerging technology solutions improve there is potentially a larger role to play for these technologies in the staged approach of network augmentation. The staged approach to network augmentation provides more optionality for consideration of non-network solutions to meet network needs.

Endeavour Energy has plans in place to utilise mobile or temporary substations where appropriate. The ability to stage investment in infrastructure for growth depends on the rate of growth. In an area which is expected to see a rapid increase in new load (e.g. commercial and industrial subdivisions, or a large new town centre) a staged option may not be economically efficient. Conversely, in an area with a lower projected rate of growth (low-density residential only), the onset of the risk of insufficient capacity can take longer thereby facilitating the exploration of lower-cost operational and non-network options to manage this risk.

In general Endeavour Energy identifies limitations in its network capability against an 'N-1' level of supply security at the sub-transmission and zone-substation level, however small or temporary substations (noted above) may operate in a 'non-secure' manner. This approach only serves to identify preferred future network

development options should future limitations be unable to be mitigated through operational response (such as load transfer) or demand management initiatives.

The actual investment timing is confirmed through a probabilistic assessment of the network risk and the optimisation of the economic benefits of any proposed development.

Non-network strategies play a significant role in Endeavour Energy's plans to service the growth in demand, especially in constrained supply areas. Demand management and non-network strategies have a higher likelihood of success in brownfield development locations compared with greenfield release areas due the potential to reduce load from the existing customer base.

4.3.1 Planning and Investing for Asset Renewal

Endeavour Energy takes a risk-based approach to asset renewal planning that matches the investment in the network to the risks posed by individual assets or groups of assets approaching the end of their useful lives.

Risks to the safety of personnel and to the continuity of the electricity supply to our customers as a result of asset failures are quantified and decisions are made to retire from service assets which present excessive risk. Assets proposed to be retired are assessed for the ongoing need for the service they provide. Where that service is still required, an assessment is made as to whether that can be provided by a credible non-network solution or whether replacement of the asset is required. Where asset replacement is required the optimum timing of the replacement of the asset is based on the balance between the annualised cost of replacement and the annualised cost of servicing the asset, including the risk the asset presents.

Furthermore, the risk to the operational management of the network arising from multiple asset failures occurring during a short period of time is factored into the assessment of whether particular classes of assets should be considered for replacement as they near their end of life or whether they are only replaced after they fail in service.

These considerations lead to an approach where an asset group that has non-catastrophic failure modes and an adequate level of network redundancy are more likely to be renewed in a reactive manner after failure. Other asset groups whose failure modes present safety or unacceptable supply security risks, or where the cost of reactive replacement significantly outweighs the cost of planned replacement, are renewed in a planned manner prior to their failure.

Further, some individual programs and projects within the asset renewal investment program are informed by advanced condition monitoring technology allowing for the targeted and efficient replacement of assets just prior to failure. This technology and the application of risk-based economic assessment of the value of each of the elements of our renewal program is resulting in efficient renewal investment which maintains risk and performance outcomes for our customers.

4.3.2 Planning and Investing for Reliability

Endeavour Energy has adopted a Reliability Strategy of maintaining existing levels of reliability, and rectifying poor-performance outliers that have been identified as per Endeavour Energy's Licence Conditions. Targeted investment leverages new technology such as distribution feeder automation schemes, where analysis shows that these are a cost-effective way of improving the Company's response to faults meeting our customers' expectations for network reliability.

4.4 Recent Changes to Planned Projects

Significant changes to planned projects compared to the previous DAPR are detailed in Table 2 below.

Table 2: Significant changes to Planned Projects Compared to the Previous DAPR

RIT-D Project	Change	Comments
Catherine Park Mobile ZS NPR-000499	Project cancelled and network need to be addressed by NPR-000054*	The planned establishment of a mobile ZS at Catherine Park, which was to be followed by NPR-000054 to establish a permanent ZS, will be cancelled based on our current demand forecast, with the network need of both NPR-000499 and NPR-000054 to both be assessed under NPR-000054 instead.
Establish Catherine Park ZS NPR-000054	Project brought forward 2 years. Name change to reflect network need	The planned establishment of the Catherine Park ZS will be brought forward from FY2031 to FY2029 based on our current demand forecast and due to the cancellation of Catherine Park Mobile ZS NPR-000499. NPR-000054 has been renamed to Capacity Increase for the Catherine Fields Growth Areas NPR-000054 to better reflect the network need.
Capacity Increase for Appin Growth Areas – Establish West Appin ZS NPR-000069	Project delayed by a year and name change from West Appin ZS	Due to delays in development by the developer, this project has been delayed by one year.
Capacity Increase for the Gilead Growth Areas – Establish Mt Gilead ZS NPR-000049	Project deferred for 2 years.	The forecast for this development has been slower than anticipated.

*The project will not proceed as a separate initiative. Its scope and requirements have been consolidated under NPR-000054 to streamline delivery and avoid duplication

5.0 Network Performance

5.1 Network Reliability Overview

Reliability of supply is a key measure of the performance of the electrical network. Endeavour Energy utilises the following two metrics to track and measure its performance:

- System Average Interruption Duration Index (SAIDI) - is the measure of the number of minutes on average that Endeavour Energy's customers are without electricity each year due to unplanned events; and,
- System Average Interruption Frequency Index (SAIFI) - is the measure of the number of outages on average that Endeavour Energy's customers are without electricity each year due to unplanned events.

These two metrics are further categorised as either normalised or unnormalised, with excludes or includes major event days (large scale events) respectively, under the AER guidelines.

Major Event Days are typically associated with adverse weather conditions and are excludable when meeting a statistically derived reliability threshold. **Figure 5** and **Figure 6** show the unnormalised SAIDI and SAIFI trend (includes major event day reliability) as well as normalised SAIDI and SAIFI.

Figure 5: Organisational SAIDI Trend (Unnormalised and AER Normalised)

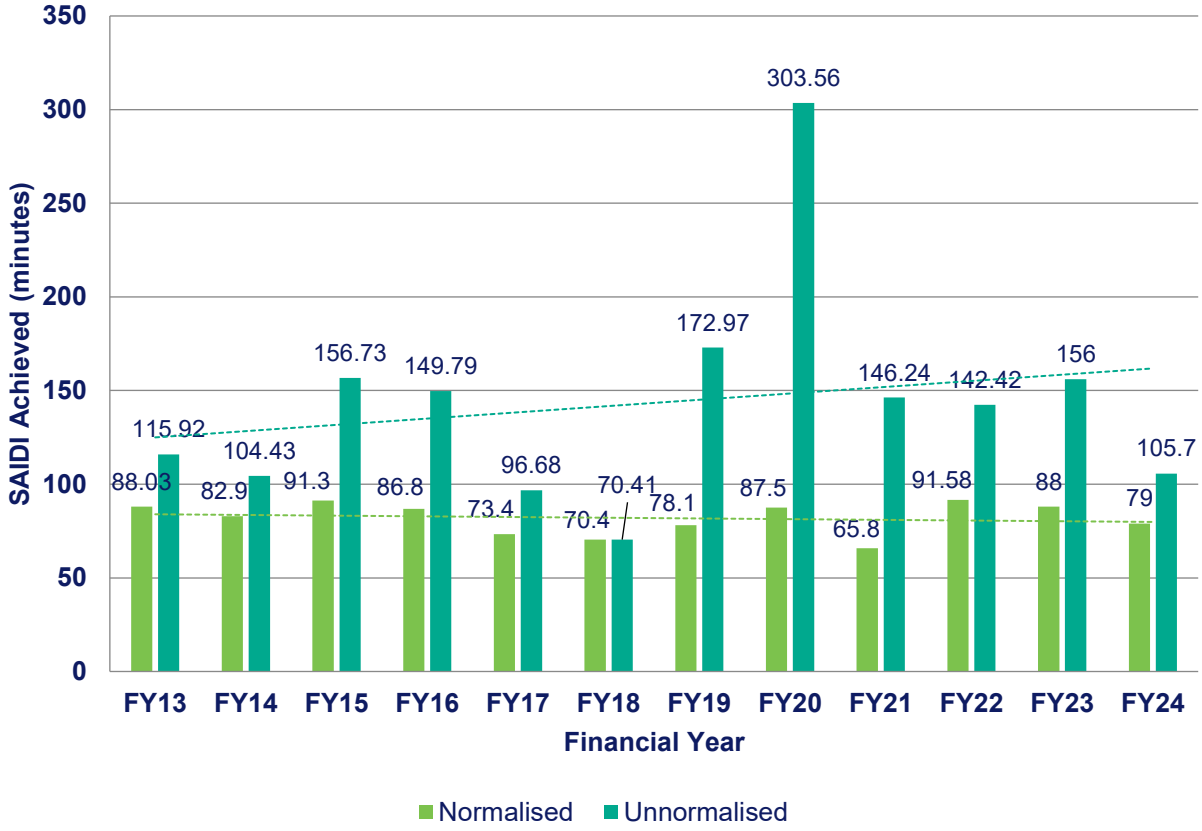
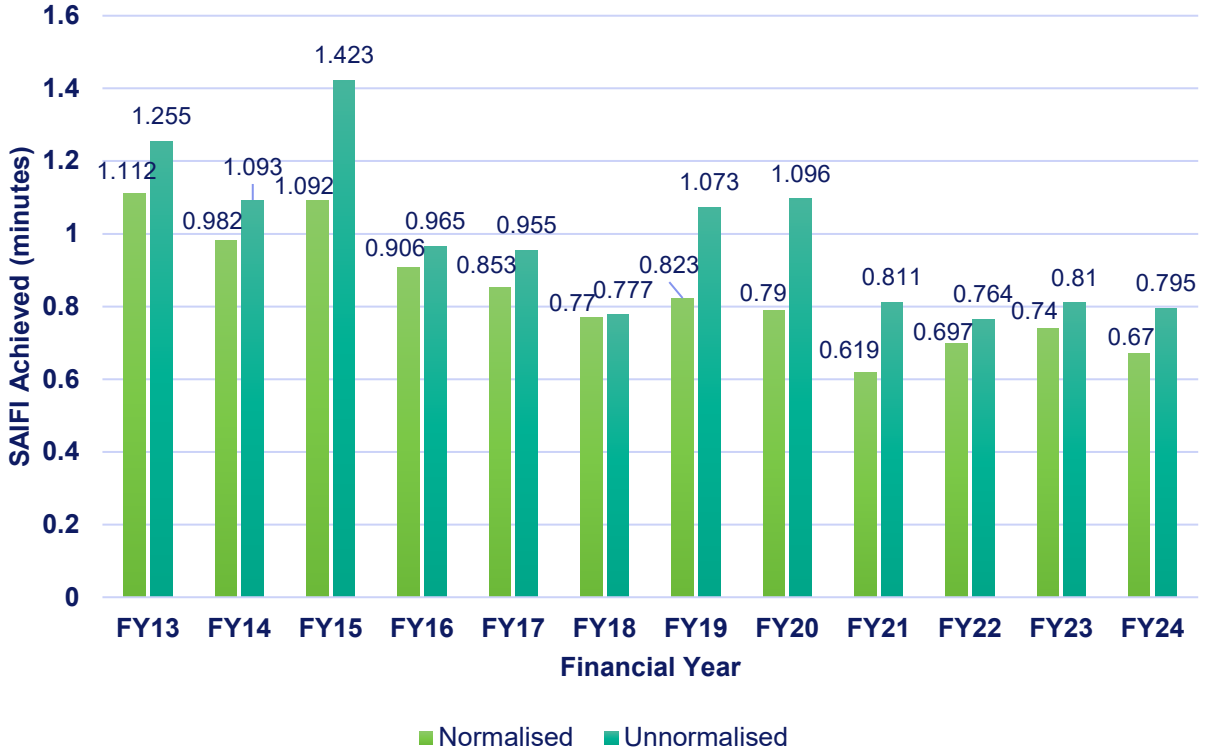


Figure 6: Organisational SAIFI Trend (Unnormalised and AER Normalised)



Endeavour Energy's AER normalised and unnormalised SAIFI performance exhibits a stable and improving trend in recent years. Normalised SAIDI has been overall stable, however unnormalised SAIDI has seen a deterioration in performance.

5.1.1 Trends in Reliability Target Performance

The NSW Minister for Energy first imposed licence conditions for the distribution network service providers on 1 August 2005 covering design planning standards, reliability, individual feeder and customer service standards. The conditions were designed to give guidance to the distributors regarding the performance levels expected by the NSW Government.

The current licence conditions were imposed on 7 July 2017, with a minister's variation in February 2019 and September 2022, taking effect in September 2023. **Table 3** provides the reliability performance information required by licence conditions 7.3 including:

- Performance against the SAIDI average standards and SAIFI average standards by feeder type, disregarding excluded interruptions; and
- Reasons for any non-compliance by the licence holder with the reliability standards and plans to improve performance.

The data listed in **Table 3** is the 'normalised' data set i.e. the overall data with 'excluded' interruptions deducted. 'Excluded' interruptions are defined in Schedule 4 of the licence conditions and are primarily outages of less than three-minute duration or outages caused by directed load shedding, planned maintenance, failure of the shared transmission system or 'major event day' outages.

Table 3: FY25 Annual Network Reliability Performance

		Whole Network and Feeder Category				
		Network *	**CBD +**	**Urban**	**Rural Short**	**Rural Long**
Customer numbers (Average over Year-to-Date)		1,131,282	N/A	772,335	358,650	297
SAIDI	Actual	76.51		49.78	134.06	N/A
	Standard from Licence Conditions	N/A		120	406	
SAIFI	Actual	0.64		0.48	0.99	
	Standard from Licence Conditions	N/A		0.8	1.7	

* Refers to the average performance of the Endeavour Energy's network overall. This measure does not form part of the licence conditions but is needed to calculate the overall NSW result.

+ The definition of a "CBD" area is a formal technical definition in the Reliability and Performance Standards against which Endeavour Energy is required to report. Key commerce centres at Parramatta, Liverpool, and Penrith which are supplied by Endeavour Energy do not fall into the official "CBD" category and hence there are no statistics against this category.

5.2 Quality of Supply

Quality of supply refers to the performance of the network in terms of steady state voltage, sags and swells, voltage unbalance, harmonic distortion, and rapid voltage variation (or flicker).

The quality of supply performance of the network is impacted primarily by the characteristics of customer loads as well as by network events and by the configuration and operation of the network. In recent years steady state voltage has become the most pressing and challenging quality of supply parameter to manage due to the increased adoption of DER, particularly solar PV, which causes reverse power flows in many parts of the network.

Harmonic distortion and rapid voltage variation (or flicker) is managed through detailed assessments of significant customer load applications, particularly commercial/industrial loads and other high voltage customers are formally assessed and provided power quality allocations in accordance with the NER, relevant Australian Standards and ENA Guidelines.

5.2.1 Quality of Supply Standards

Endeavour Energy's adopts limits for power quality parameters as per the planning levels in the AS/NZ61000 series of standards as referred to in the national electricity rules. Emissions allocations are provided to larger customers on a site-specific basis upon receipt of a connection application.

5.2.2 Quality of Supply Compliance

Steady State Voltage

Endeavour Energy has increased its access to power quality data from customer smart meters significantly in recent years. This data is available from Meter Data Providers under commercial terms.

This smart meter data is being processed by an Analytics platform to automatically track and calculate compliance to the steady state voltage limits per AS61000.3.100. Under this standard, a network is determined to be compliant if less than 5% of customers are outside of the steady state voltage limits.

6.0 Demand Forecasts for the Forward Planning Period

The Endeavour Energy transmission and zone substation peak demand forecasts are provided in the DAPR Mapping Portal https://dapr.endeavourenergy.com.au. The peak demand forecasts provide Endeavour Energy with the basis for identifying network limitations and commencing the RIT-D process to identify and evaluate the credible network and non-network options to address those limitations. They are also informed by longer term area plan forecasts that outline investment needs to service new development areas that are primarily 'greenfield' in nature.

Growth in customers connecting to our network is a key driver of network related capital investment. In the previous decade the growth in demand was fundamentally driven by an increase in residential, commercial and industrial development areas within the priority growth areas of Western Sydney and the Illawarra.

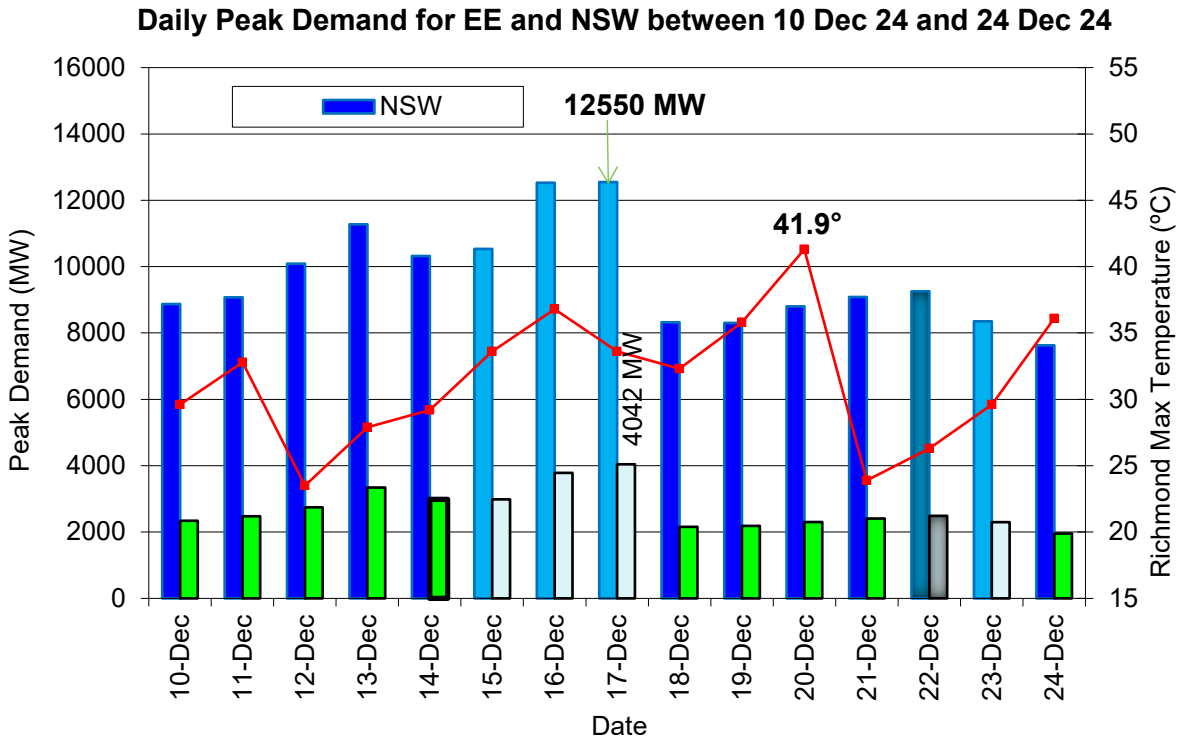
In recent years the penetration of air-conditioning appears to have reached saturation point in some areas of our network, particularly for the residential sector. Consequently, peak demand growth from existing connections no longer presents a significant driver of network expenditure. Furthermore, demand in recent years has seen a decline due to the effect of energy efficiency measures, the roll-out of roof-mounted photovoltaic systems and reductions in the demand from large industrial customers. It is further expected the energy efficiency measures and the installation of photovoltaic systems, coupled with the forecast increase in battery installations, will continue to influence a reduction in demand over the forecast horizon for established areas. However, the rate of adoption of electric vehicles in the medium term will change the demand profile for the residential sector and could lead to growth in peak demand again.

Strong demand for housing has precipitated the establishment of further priority growth areas, as well as underpinned increasing densification in existing areas around transportation hubs such as the North-West and South-West Rail Corridors. Furthermore, the establishment of Western Sydney Airport and the unlocking of substantial tracts of employment lands around it has created strong growth in the commercial industrial sector as well. Endeavour Energy is experiencing strong demand for advanced facilities, that are highly electrified, and require higher capacity solutions than what is historically been observed. Strong economic growth is expected in the growth centres over the forecast period, with a series of major transport, health and education projects planned for the region.

The Endeavour Energy Network aggregate demand for the 2024/25 (2025) summer peaked at 4,042 MW at 16:45 on Tuesday 17 December 2024 corresponding to a temperature of 41.3°C at the same time. The maximum temperature recorded at North Richmond was 41.9°C on Tuesday 29 January 2025 and peak demand on this day was 3,480 MW.

Figure 7 shows the time series of the daily maximum temperatures at Richmond and the peak demands on the Endeavour Energy network and NSW during the 2025 summer peak demand period. The Endeavour Energy peak demand of 4,042 MW is taken from the Endeavour Energy network assets level (an 'our network' view of the maximum demand on our assets) and the maximum demand aggregated at the Bulk Supply Point level is marginally higher with the inclusion of electrical system losses.

Figure 7: Daily Peak Demand for Endeavour Energy and NSW Between 10 Dec 2024 and 24 Dec 2024



Note: Peak demand during non-working days are shown in lighter colours.

Endeavour Energy now produces minimum demand forecasts and in the process of refining the methodology and determining constraints that arise from minimum demand and associated reverse power flows.

6.1 Forecasting Methodology Overview

The make-up of the electricity system is rapidly changing. As new technologies connect and our grid expands, our forecasts help to inform the planning of our network. More recently, electrification of appliances and vehicles, embedded generation, storage and data centres are key drivers that are increasingly influencing demand and energy growth.

Endeavour Energy uses the Vision Forecasting tool (in partnership with Blunomy) to predict network demand and energy use, factoring in current configurations and emerging trends. The published DAPR forecast is based on a detailed analysis of rooftop PV, batteries, EVs, energy efficiency, GSP, electricity prices (from AEMO ISP scenarios), and population data from NSW government forecasts at the SA2 level. All inputs are adapted for Endeavour Energy's area under AEMO's "Step Change" scenario.

As demand on the network is heavily influenced by weather, network peak demand forecasts are prepared for both the summer and winter season. Summer is defined as the 6-month period between 1 September and 31 March while winter consists of the 6-month period from 1 April 1st to 31 August.

6.2 Forecasting Approach

The Vision Forecasting tool produces demand forecasts as 30-minute time-series over a 10–25-year horizon, using representative weather conditions and incorporating the impact of technologies such as solar PV, batteries, EVs, and electrification. This approach goes beyond peak demand forecasting, enabling analysis of structural changes in load patterns and their effect on maximum and minimum demand as well as unserved energy. The forecast combines multiple components to model demand as a 30-minute time series using Monte Carlo sampling at 90%, 50%, and 10% Probability of Exceedance:

- Native Demand – Impact to demand as a result of energy efficiency, population growth, Gross State Product (GSP) and projected electricity prices.
- Customer Energy Resource Forecasts
    - Solar PV – As embedded generation increases, so too does reverse flow and self-consumption
    - Electric Vehicles – Impact demand based on charging habits of customers
    - Storage – Impact demand based on charging and discharging habits of customers
- Electrification of Gas – As gas appliances transition to electric, demand can increase along with energy consumption
- Block Loads – Considers proposed connections including data centres, commercial developments, subdivisions, generation etc
- Large Generators - Large dispatchable generators are not controlled by the network and therefore impart significant risk on the network in the event that they shut down unexpectedly.

Short-term native demand is modelled across 10 representative weather years using a Bayesian Neural Network. Samples are then scaled using a Mixed Linear Effects model to reflect long-term native load growth across the forecast horizon.

CER profiles (PV, EV and Storage models) are multiplied by their forecasted uptake and added to the time series. Block loads, with capacity and profiles defined Endeavour Energy as guided by connecting proponents, are added to the timeseries and the maximum demand of each sample is recorded.

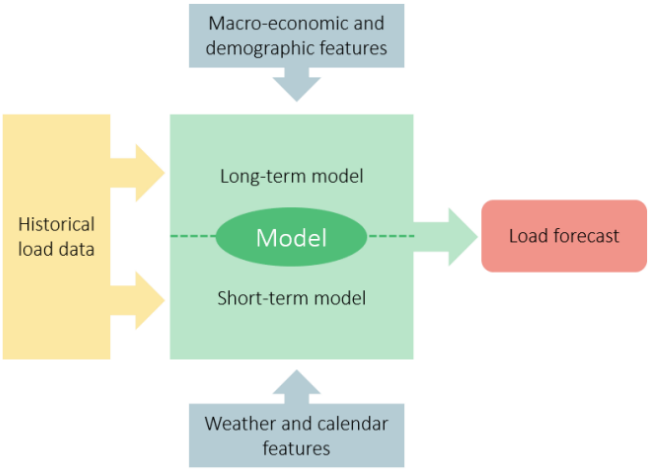
Native Demand

Native demand is a new concept which both provides the post model adjustment for weather effects and provides Organic Growth. The Native demand is therefore leveraged to capture all unplanned and ‘unknown’ load growth across the network. Native demand is population driven, being built from the Endeavour Population Forecasts. A model external to the Vision tool is leveraged to remove any planned loads (Block Loads) from the Endeavour Population Forecasts, mitigating against ‘double counting’ with the Block Loads.

Native demand model is divided in two main components:

1. A short-term model, with a 30-minute temporal resolution that considers weather and calendar effects impacts on the asset’s load, as well as time of use and shifts of consumer pattern (i.e. providing the model adjustment due to weather impacts)
2. A long-term model that considers macro-economic and demographic impacts on the yearly trend in energy consumption.

The final forecast is then obtained by scaling the short term with the long-term trend



CER Forecasts (PV, EV, Storage)

Each DER technology uses a different methodology to calculate its consumption/generation profile and its impact on the demand on the asset. However, the methodology for each follows a similar structure, composing models for:

1. An uptake, which defines how ownership / installation of the technology increases over time
2. A profile, which defines how a technology consumes / generates power throughout the day / year.

The combination of an uptake and profile gives us a long term, half hourly forecast for each DER technology.

The uptake is defined at the state level using AEMO inputs is distributed down to the assets on the network. This process considers local demographic, macro-economic and technology uptake data to sensibly redistribute the uptake across the network, whilst still reconciling to the total.

Electrification of Gas

For residential electrification, data on gas consumption is converted to an equivalent electricity consumption. The process of electrification is assumed to grow over time, at a rate driven by greenfield, knock-down/rebuilds and renovations. This is guided by publicly available gas data from local gas distributors. A hot water and space heating profile (based on electric appliance usage) is applied to give the electrified appliances an appropriate load profile.

Industrial electrification follows a similar method, except the load profile used is derived from each industrial customer's historical data.

Block Loads

Representing Planned Growth, Block loads are formed from planner inputs which consist of known upcoming Planning coordinated connections. Block loads are developed for each individual connection, leveraging different customer profiles to represent the timeseries nature of the load. These are in addition to Native Demand due to Native demand representing organic growth only.

Large Generators

To account for this risk, the generator's time-series trace is added (positively) back to TS and BSP asset timeseries datasets (producing a 'Gross' load view), so that the forecast calculates the maximum demand in the event that the generator switches off.

The final forecast published for the DAPR is based on a detailed analysis of residential rooftop PV, batteries, plug-in EVs, energy efficiency, GSP, and electricity prices according to AEMO ISP scenarios in the "AEMO's

2025 Inputs and Assumptions and Scenarios Report," tailored for Endeavour Energy's supply area under the "Step Change" scenario.

Peak demand forecasts for proposed assets are derived from longer term area plan forecasts that underpin future asset requirements and associated capital expenditure. These area plan forecasts incorporate expected land use and associated power density metrics, using After Density Maximum Demand (ADMD) values for residential subdivisions and Volt Amperes (VA) per square metre for commercial and industrial developments. These inputs are integrated into network peak demand forecasts for assets scheduled within the planning horizon.

As demand on the network is heavily influenced by weather, network peak demand forecasts are prepared for both the summer (November to March) and winter (May to August). The forecast method is based on a bottom-up approach and provides maximum and minimum MVA, MW and MVAr demands and the power factor expected for the summer and winter peak periods.

The forecasts are prepared for each zone substation and major customer substation, each transmission substation and Transgrid's Bulk Supply Points (BSP) that supply the Endeavour Energy network. the aggregate network peak demand is also included. These forecasts consider planned load transfers, expected spot loads, land releases, redevelopments, and embedded generation.

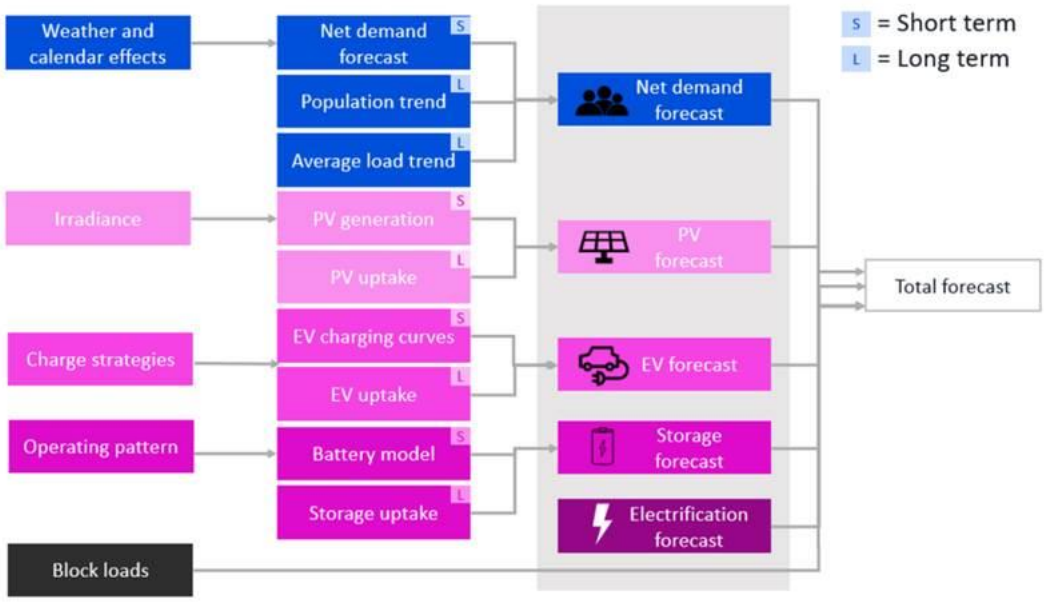
Historical and forecast peak demands at all levels—network, BSP, transmission, and zone substations—are normalised to specific weather conditions. Temperature Corrected Maximum Demand (TCMD) estimates the likely peak demand under reference conditions with 10% and 50% Probability of Exceedance (PoE). Weather correction is applied by default but can be excluded if required.

The peak demand forecast considers the growth or decline from the existing customers as well as the new customer connections. The forecasting process has two major steps:

1. Incorporating the network planner's inputs into the base level forecast - The inputs include new developments planned to occur (lot releases), new load increases expected from customer applications (spot loads) and information regarding the transfer of load between zone or sub-transmission substations (load transfers).
2. Applying Post Model Adjustments (PMA) - PMAs are applied to each year of the forecast for each zone substation based on the zone substation's residential, commercial and industrial customer mix and its peak demand for the season. PMAs are designed and used to capture future changes in the peak demand resulting from solar generation, battery energy storage, electric vehicles and from different state and national energy policies/programs, such as the Minimum Energy Performance Standards (MEPS), NSW Energy Savings Scheme (ESS) and changes to the building code.

The final forecasts for all assets (zone substations, transmission substation, bulk supply points) are reviewed for consistency with expected demand growth based on local knowledge of load transfers, embedded generation, proposed spot-loads and lot release information.

► The Maximum demand of each sample is recorded



6.3 Forecast Input Information Sources

For proposed assets, development precinct data is sourced from the Department of Planning & Environment, the Housing Industry Association, connection applications and enquiries received by Endeavour Energy and direct discussions with developers.

The Vision forecasting process relies on several key inputs. Technologies are informed by AEMO's CER uptake data, which includes projections for photovoltaic (PV) systems, electric vehicles (EV), and battery storage. Macro-economic factors are derived from AEMO's assumptions and population forecasts. These cover energy efficiency trends, Gross State Product (GSP), electricity price trajectories, and population growth.

Electrification uptake is based on modelling by Blunomy, which examines the transition from gas to electricity. This includes gas consumption patterns and hot water systems. Transfers are informed by Endeavour Energy's planned load movements, which may involve partial transfers or full asset transfers across the network.

Block loads are forecast using details captured during Endeavour Energy's connections process and external data sources. These include details about proposed assets, development precinct data from the Department of Planning & Environment and the Housing Industry Association (HIA), connection applications and developer discussions. Endeavour Energy also uses HIA data to adjust AEMO's 2025 population figures, distributing them across its network to align with a linear growth trend.

6.4 Assumptions Applied to Forecasts

The following probability of exceedance (PoE) parameters have been adopted:

- 1 in 10-year event (corresponding to 10% PoE); and
- 1 in 2-year event (corresponding to 50% PoE).

A 10% PoE figure is estimated to be exceeded once in every ten seasons on average whilst a 50% PoE figure is likely to be exceeded every two years on average.

Each input to the forecasting process is underpinned by assumptions that influence how scenarios are modelled. These assumptions reflect expected trends, behaviours, and external factors, providing a foundation for consistent and transparent forecasting.

6.4.1 CER Technologies

The AEMO forecast provide both organic and planned growth. Blunomy uses these for the forecasts however with the platform currently only applies these to existing assets. Endeavour is working to improve the approach and therefore in the interim there is a specific approach to determine both Planned and Organic CER growth

Photovoltaic (PV) Growth

PV growth is modelled through two components: organic and planned. Organic growth is based on historical connection trends, using an S-curve approach to project future uptake for each asset and this method refined as more data becomes available. Planned PV growth is incorporated through PV block loads, representing installations linked to planned works. Both organic and planned growth are reconciled at the network level to avoid double counting.

Energy Storage

Battery storage uptake is assumed to closely follow PV adoption, as PV is considered the primary driver for storage. Planned storage growth is captured through block loads created by Blunomy, similar to PV. Battery operation is assumed to prioritise on-site consumption. Statewide battery forecasts are allocated at the feeder level based on projections for new rooftop PV systems, under the assumption that batteries are installed concurrently with PV. Aggregate battery load is calculated by multiplying the typical load profile of a single unit by the forecasted number of installations.

Electric Vehicles

EV growth, both organic and planned, is managed by Blunomy. Planned uptake is determined using population splits between planned and organic growth, ensuring alignment with broader demographic and infrastructure trends.

6.4.2 Macro Economics

Population growth

The Vision Forecasting tool forecasts load against existing assets and relies on Endeavour to provide coverage for planned assets. Greenfield growth is managed through scenarios that split population into planned and organic growth components. Brownfield population forecasts are leveraged within the Vision Forecasting tool to form the ‘Native’ forecast load representing organic growth. Planned greenfield forecasts are replaced with Endeavour’s connection Block Loads, capturing all known planned assets.

Electricity Price

Demand projections reintegrate PV generation and adjust for behavioural changes influenced by Gross State Product (GSP), electricity prices, and energy efficiency. Consumption per capita is scaled to the forecasted population, producing demand trends aligned with AEMO’s assumptions.

6.4.3 Electrification Uptake

Electrification of Gas

Residential electrification is estimated by converting local government area (LGA) gas consumption data to equivalent electricity usage, with growth projections based on greenfield developments and renovations. Similarly, industrial electrification utilises each customer’s historical load profile to determine electricity demand.

Managed/Unmanaged Hot Water

Blunomy models the impact of changing unmanaged hot water systems to managed hot water systems (electric systems). Managed and unmanaged customer profiles are modelled and compared to understand the increase of demand. This is then incorporated into the forecast to reflect the potential increase in demand should unmanaged systems become manage

6.4.4 Block Loads

Connection details are captured through Endeavour Energy's connections process, while data for proposed assets is sourced from development precinct information provided by the Department of Planning & Environment, the Housing Industry Association (HIA), connection applications, enquiries, and direct discussions with developers. HIA data is also used to adjust AEMO's 2025 population figures, distributing them across the Endeavour Energy network to align with a linear growth trend. Additionally, data centre loads are included in the forecast based on a probability of realisation criterion.

6.4.5 Load Transfers

The determination of the load transfer capability for each substation involves the analysis of individual distribution feeders and their ability to carry additional load after network switching occurs. Consequently, this is only performed for substations that are experiencing limitations and may need to be offloaded. The analysis involves determining the load that could potentially be transferred away from the constrained network on a permanent basis.

6.5 Demand Forecast

The capacity, forecast demand and any network limitation on each of the transmission and zone substations on the Endeavour Energy network and on the associated sub-transmission networks are listed in the DAPR Mapping Portal https://dapr.endeavourenergy.com.au. The RIT-D level identified network needs are summarised in Table 5 and Table 6 of this DAPR (see section 8.2).

Limitations are referenced to the design level of supply security at each substation. In general Endeavour Energy assesses its network capability on the basis of providing an "N-1" level of supply security at the sub-transmission and zone-substation level, however small or temporary substations may operate in a non-secure manner, and these are marked as limited to N. Generally, these have maximum demands of less than 10 MVA. This approach serves to identify preferred future network development options should future limitations be unable to be mitigated through Demand Management initiatives. The actual investment timing is confirmed through a probabilistic assessment of the network risk and the optimisation of the economic benefits of any proposed development.

The substation total (installed) capacity is the maximum load able to be carried by the substation with all elements in service. The secure capacity of a substation is the capacity with one major element (such as a power transformer or sub-transmission feeder) out of service. This is often referred to as its "Firm" or N-1 rating.

Transmission substations are considered to be constrained when the load exceeds the secure capacity. Suburban zone substations are constrained when the demand exceeds the firm capacity which is the trigger point for commencing investigations for cost-effective options to address the limitation. The exception are substations whose rating is limited by underground feeders or where exceeding secure capacity will result in the thermal rating of apparatus being exceeded in its normal configuration. In these situations, the load may not exceed the secure capacity of the substation for any period of time.

The voltage levels of Endeavour Energy's sub-transmission substations (termed 'Transmission substations') are nominally 132kV on the primary and either 66kV or 33kV on the secondary. The voltage levels of Endeavour Energy zone substations are nominally 132kV, 66kV or 33kV on the primary and 22kV or 11kV on the secondary.

The forecast is prepared following the end of each peak season. The zone substation rating changes have only been included where the associated project(s) which are influencing the rating have been given approval and are committed at the date of preparation of the forecast.

The forecast power factor readings correspond to the power factor at time of peak load. A dash in this field indicates that the transformer was either not commissioned at the time of measurement or is normally unloaded.

Forecast demands for the sub-transmission feeder network are based on its 'N' rating, summer or winter, and the 'N-1' loading, that is, the worst condition load that would appear on the feeder with an adjacent feeder out of service compared to the thermal rating of the smallest conductor or cable on that feeder.

The '95% Peak Load Exceeded (hours)' figure in the Transformer Rating and Substation Details table represents the number of hours the load is above the 95% level of actual peak demand. It is an indication of how peaky the load profile is which is important for designing an effective non-network option.

The 'Actual (MVA)' figure that appears in the summer and winter demand forecast tables is not temperature corrected. It is the actual recorded load. The forecast loads are based on temperature corrected actuals.

The 'Embedded Generation' figure that appears in the Transformer Rating and Substation Details table provides the estimated aggregate level of embedded generation connection to the network supplied from that substation. It includes residential and commercial PV and customer generation. Customer details are withheld for privacy reasons.

The summer 2025 refers to the 2025/26 summer.

The transmission-distribution connection points are termed Bulk Supply Points (BSP) and are owned by Transgrid, the NSW transmission company.

Endeavour Energy evaluates the capability of its sub-transmission network on the basis of load flows modelling different contingencies and network operating configurations. The sub-transmission forecast tables in this document are desktop estimates derived from zone substation load forecasts and are based on an assumed operating configuration and on the present-day network. The loads presented are indicative of the load on the stated feeder in the event of the most likely contingency. Hence, the sub-transmission forecast tables should therefore be treated as indicative loading data in the event of a credible contingency event.

6.6 Analysis and Explanation of Forecast Changes

There have been significant changes occurring within the customer groups that influences demand on the network and the demand forecast. These include:

- an increase in areas prioritised for development by the NSW government. This is reflected in our Growth Servicing Strategy;
- the Western Sydney Aerotropolis showing increased load growth from 2025 onwards;
- continuing focus on redevelopment of existing areas especially along rail corridors; and
- a number of large customer applications and connections in the Western Sydney area, particularly data centres, which has dramatically increased demand forecasts in this area.

Certain areas in the priority growth areas have accelerated their lot release projections as well as densities resulting in increased levels of demand growth. However, all lot release projections are diversified to account for the lag in housing development.

There has been unprecedented and significant rezoning of employment lands, particularly in and around the Aerotropolis precinct which needs to be closely monitored together with the electrification plans for vehicle fleets and growth in artificial intelligence infrastructure hosted by data centres.

7.0 Planning Coordination

7.1 Joint Planning with Transgrid

Endeavour Energy and Transgrid have a formal joint planning charter between the two companies. The joint planning working group is overseen by an executive steering committee.

Joint planning is carried out with Transgrid on a quarterly basis or as required. Agreed actions are documented and action plans developed by each company as required. Separate joint planning for specific projects is carried out in addition to regular joint planning meetings.

Areas where network limitations and/or network developments affect the electricity networks of Endeavour Energy jointly with Transgrid are discussed below.

7.1.1 Process and Methodology

Endeavour Energy confers with Transgrid on technical matters relating to Endeavour Energy's connections with Transgrid at bulk supply points (Transgrid connection points). These matters include:

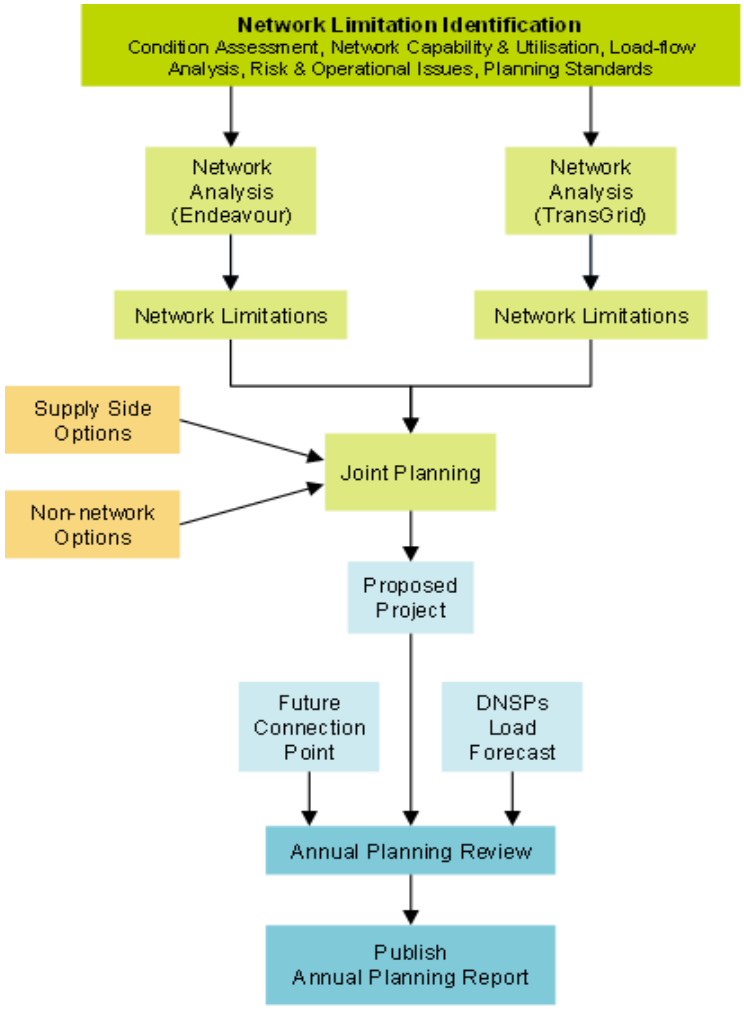
- Forecast loads for all BSPs supplying Endeavour Energy's network;
- Supply capability at all BSPs supplying Endeavour Energy's network;
- Exchange of system modelling data;
- Coordination of loading requirements on individual BSPs and across other BSPs;
- New BSP requirements and connection arrangements;
- Coordination of communication, protection and control requirements; and
- Coordination of other operational requirements.

Clause 5.14.1 of the NER sets out the planning process and consultation requirements and includes requirements on forecasting, annual reviews, regulatory tests and consultations. The principal inputs to the planning process are:

- DNSP supply point load forecasts;
- Review of network capacity and utilisation;
- Planning criteria and indicators;
- Condition, operational and risk assessments;
- Transmission network load-flow analysis; and
- Transgrid planning reviews.

The relationship between the various elements in the planning process is shown in **Figure 8**.

Figure 8: Joint planning process with Transgrid



Note that Endeavour Energy does not have any assets that are classed as “dual function assets” under the NER.

7.1.2 Overview of Bulk Supply Investments

Vineyard 132kV

A project requiring a switchbay at Vineyard Bulk Supply Point for supply to Box Hill has been delivered.

A project to manage voltage stability issue by looping into line 26. This is expected to be delivered by Transgrid in 2028/29.

Macarthur 66kV Switchbay (Menangle Supply)

A 66kV switchbay will be required at Macarthur Bulk Supply Point to supply the permanent Menangle Park Substation by 2028. The project is development driven.

Macarthur 66kV BSP Augment

A second 330/66kV transformer at Macarthur Bulk Supply Point has now been installed.

Macarthur 132kV BSP Augment

Augment of Macarthur is included in the regulatory investment test for the Western Sydney Priority Growth Area.

Sydney West BSP Augment

The current levels of applications for large spot loads and commercial and industrial growth in the Sydney West supply area require augmentation of Sydney West by 2027.

The result of joint planning with Transgrid, and options analysis being undertaken by Transgrid are that a sixth 330kV/132kV transformer at Sydney West is to be installed by February 2026. This work requires the relocation of some Endeavour Energy feeders to enable the connection. The sixth transformer may also introduce fault level constraints which will need to be managed (most likely through operational configuration).

Further relief for Sydney West BSP is expected to be provided via a project to establish the Kemps Creek Bulk Supply Point, although this BSP is primarily picking up new load growth associated with the new Western Sydney Airport and broader Aerotropolis. An additional BSP will be required by 2032 to augment capacity at Sydney West due to significant forecast peak demand growth.

Bulk Supply Point for Western Sydney Priority Growth Area at Kemps Creek

As indicated in the section above in relation to Sydney West BSP augment, augmentation of both Sydney West BSP and Macarthur BSP provides for a staged response to the rapidly growing Aerotropolis region in the short term, although it does see the exhaustion of the land provisioned at these sites.

To provide long term energy security to our customers, new investment is jointly required by Transgrid and Endeavour to continue to provide capacity for growth of the Aerotropolis region as well as historical catchments of Sydney West and Macarthur BSPs.

Joint planning has determined that a new bulk supply point will need to be established directly adjacent to Transgrid's Kemps Creek 500/330 kV substation by 2030.

There is also a need to add an additional 132/66kV 375MVA transformer at Transgrid's Macarthur BSP by 2028.

These investments completed public consultation via a joint RIT-T process in 2025 and are now committed projects for Transgrid and Endeavour Energy.

Other Future Investments

Discussions are continuing with Transgrid in relation to:

- Managing Voltage, Power Factor and reverse power flows in relation to minimum demand at a number of connection points, notably Vineyard and Macarthur.
- Joint planning discussions with Transgrid to recommence the deferred Tomerong Bulk Supply point project due to emerging constraints in the South Coast supply network have been put on hold as there are emerging requirements associated with the Illawarra Renewable Energy Zone and significant generation enquiries for the area.
- Joint planning discussions have been initiated with Transgrid to investigate the feasibility of establishing a Bulk Supply Point at Appin and alternative options for address emerging constraints in Endeavour Energy's 66kV network in the area arising from a need to service substantial new residential developments.
- Joint planning discussions with Transgrid have resulted in Transgrid exploring the option of installing a 3rd 375MVA transformer, and 132kV busbar at Holroyd BSP in RP4.
- Joint planning discussions with Transgrid have resulted in Transgrid exploring the option of installing a 4th 375MVA transformer at Vineyard BSP in RP4.
- Joint planning discussions with Transgrid have resulted in Transgrid exploring the option of installing an additional 375MVA transformer at Kemps Creek BSP in RP4.

- Joint planning discussions have been initiated with Transgrid to offload addition load constraints at Sydney West BSP, tentatively to be resolved in RP4.
- Protection changes required at Transgrid substations in relation to new zone substations that Endeavour Energy will be commissioning within between Sydney West and Macarthur connection changes.
- Endeavour Energy and Transgrid have embarked on strategic planning to determine long term needs for the Endeavour Energy supply area and includes a consideration of future Bulk Supply Points and Transmission infrastructure requirements for the region.

7.2 Joint Planning with Other DNSPs

Joint planning between Endeavour Energy and Ausgrid and Endeavour Energy and Essential Energy follow the same principles as applied to the joint planning process with Transgrid. While there are limited dependencies between the distribution networks, these arrangements remain important for addressing shared network issues. Meetings are generally held on an as-needs basis to resolve specific constraints or projects that impact multiple networks. In recent years, these discussions have broadened in scope to reflect the collaborative approach outlined in the NSW Distribution System Plan (DSP). This includes aligning planning assumptions, sharing demand forecasts, and exploring opportunities for coordinated investment in areas such as sub-transmission capacity, battery storage, and integration of consumer energy resources. By adopting consistent methodologies and a whole-of-system perspective, DNSPs can reduce duplication, improve transparency, and ensure that local network decisions contribute to broader state and national energy transition objectives.

7.2.1 Process and Methodology

Formal joint planning meetings between the planning groups of the companies form the basis of the joint planning process as per the planning process with Transgrid.

7.2.2 Joint DNSP Planning Completed in Preceding Year

Endeavour Energy conducted one joint planning meeting during 2025 with Ausgrid focussing on collaboration around challenges faced by DNSPs including connection of inverter-based loads and generation, and connection of large data centre loads. A project to connect two of Ausgrid's zone substations to Endeavour Energy's Camellia sub-transmission substation is underway with two of the four 33kV connections now commissioned.

Endeavour Energy conducted one joint planning meeting with Essential Energy during the year. This meeting discussed information sharing on planning systems, tooling and process, customer processes and sub-transmission connection enablement, as well as upcoming regulatory concerns and strategies.

Endeavour Energy conducted one joint planning meeting with Sydney Trains during the year.

7.2.3 Planned DNSP Joint Network Investments

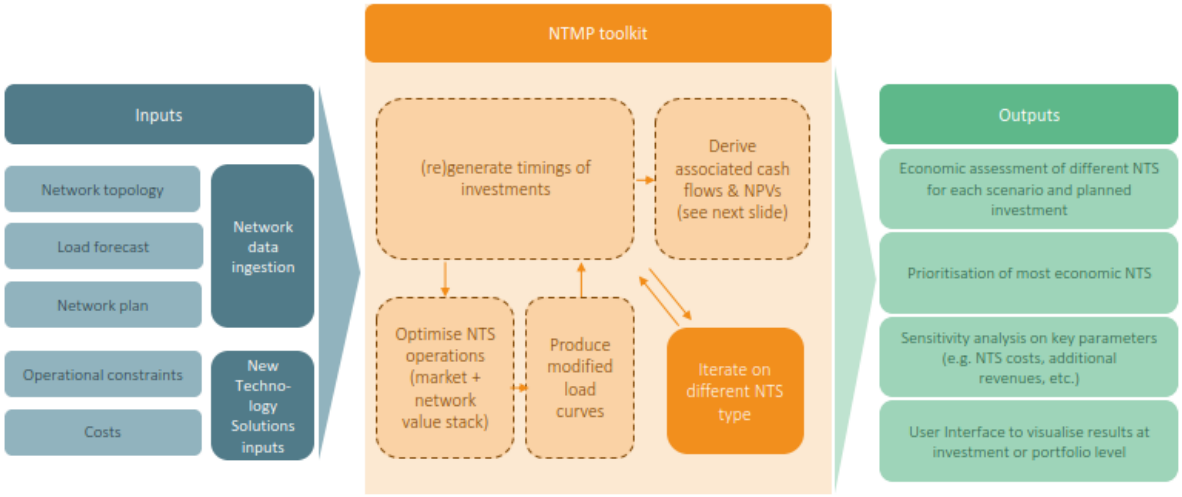
There is currently a project (in construction) to supply Ausgrid's Auburn and Lidcombe zone substations from Endeavour Energy's Camellia Transmission Substation.

7.3 Consideration of Non Network Alternatives in the Planning Process

Endeavour Energy considers non-network alternatives as an integrated part of network planning. When considering network investments in meeting demand growth, new connections or asset replacement, non-network alternatives are considered to identify opportunities to defer or avoid network investment.

Endeavour screens potential network investments for non-network and new technology solutions to identify and evaluate credible solutions.

Figure 9: New Technology Master Plan Input and Output Model



As shown in **Figure 9**, the NTMP tool allows us to assess network support options such as embedded generation, virtual power plants, grid-scale batteries, commercial customer direct load control and residential behavioural demand response.

This tool integrates existing network data and enables the efficient exploration of the net-benefits of various non-network solutions at a pre-feasibility stage, considering the various uncertainties and sensitivities.

The NTMP tool furnishes Endeavour Energy with the knowledge and business capabilities that will allow for the effective identification of new technology options as potential non-network alternatives.

The NER requires DNSPs to investigate non-network options by utilising a consultation process as part of the planning for major network investments. This is the RIT-D process shown in **Figure 10**.

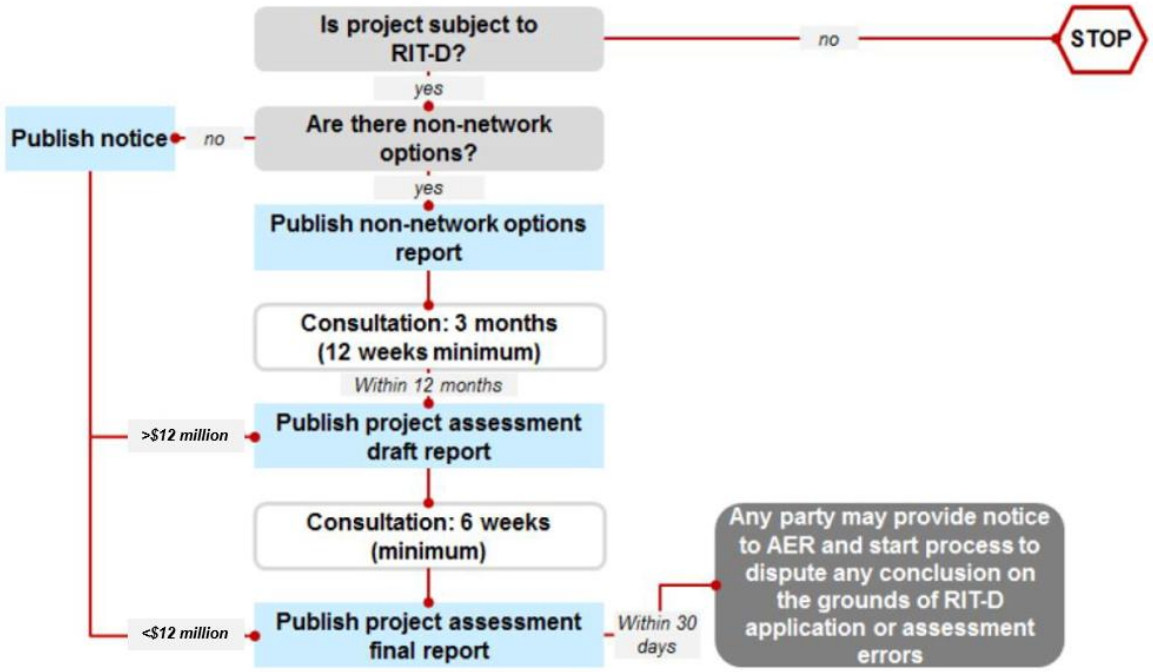
This provides the opportunity for all interested parties and the community to submit options, ideas and comments allowing for the development of cost-effective demand management and support non-network alternative options.

Our RIT-D non-network option investigation process comprises the following stages:

- A planning review to identify the emerging network constraints and credible network options;
- Screening for non-network options supported using our New Technology Master Plan tool;
- Publish a Non-Network Options Report as part of a market consultation process to obtain proposals for alternative options from interested parties where a demand management approach is determined to be feasible;
- Evaluation of submissions to identify cost-effective credible non-network options;
- Evaluation of all credible options (network and non-network) to identify the most cost-effective option or combination of options; and
- Negotiations with proponents of the successful proposal to implement the program if a non-network option is identified as the most cost-effective option.

All parties registered on Endeavour Energy's register of interested parties are notified when a RIT-D document is published.

Figure 10: Regulatory RIT-D Process



8.0 Identified Network Needs

Identifying network needs is a key element of the network planning process through:

- Network analysis using the latest demand forecasts to identify emerging network capacity or supply constraints; and
- Asset condition or performance assessments to identify assets approaching their end-of-life.

Network needs that have been identified as being subject to the RIT-D process are outlined in Table 5 and Table 6 and given in Section 8.2. These are within the 5-year planning horizon.

Projects that do not meet the RIT-D criteria and that will be investigated for non-network options are listed in Table 8.

Future network needs that are beyond the 5-year planning horizon have also been identified and presented below. These future network needs are dependent upon demand growth and progress in proposed developments prior to any commitment to network investment. Future network needs are listed in Table 10.

8.1 Definition of terms used in Network Needs

Table 4 below provides definitions of the terms used in the Identified System Limitations tables in Sections 8.2, 8.3 and 8.4.

Table 4: Terms Used in Identified Network Needs

Term	Definition
Critical Season	The season of most critical peak demand (summer or winter) in terms of network limitation.
Existing Capacity (firm)	The firm capacity that the network element can supply with one element of redundancy available. In the case of the 11kV network it is the firm capacity whilst preserving the appropriate level of backup.
Demand Forecast	The next year forecast of peak demand for the most critical season.
Capacity Limitation Rating Reached	Indicates that the load at risk has reached unacceptable limits being either cyclic or emergency rating exceeded or the expected energy at risk is above acceptable limits in the next following year.
Limitation Date	Indicates when both the firm rating of the network supplying the load (F) and its corresponding capacity limitation rating (C) is exceeded.
RIT-D Start Date	The year in which Endeavour Energy anticipates options investigation to commence. RIT-D start is timed to meet capacity limitations.
Load Transfer Potential	The load in MVA that could potentially be transferred away from the constrained network, through the existing network, on a permanent basis. This analysis is performed for constrained assets only.
Required Load Reduction	The required level of load reduction to achieve a one-year deferral of the network limitation.
Potential Solutions	The currently identified credible options to resolve the network limitation including network and non-network solutions (subject to public consultation or a feasibility review).
Asset Retirement	The removal of an asset from service due to the asset reaching its end of life or a condition where the asset can no longer service the network due to performance or safety risks.

8.2 RIT-D Investigations

This section presents the RIT-D augmentation and replacement projects in the 5-year planning horizon that Endeavour Energy will investigate. Endeavour Energy reviews its network needs on a continuous basis and the dates shown may be adjusted from year to year as the underlying customer demand and network need change over time.

Listed in **Table 5** are the identified augmentation RIT-D projects and **Table 6** details the retirement or replacement RIT-D Projects. The Endeavour Energy project identification number has been included to allow matching to our other regulatory reporting. Identified needs based on place names may change over time and place names are determined by the relevant authorities.

Table 5: Identified Network Need – Augmentation RIT-D Projects

RIT-D Project Name	Critical Season	Existing Capacity (firm) (MVA)	2025/26 Demand Forecast (MVA)	Capacity Limitation Rating Reached	Limitation Date	RIT-D Start Date	Load Transfer Potential (MVA)	Required Demand Reduction (MVA)	Potential Solutions
Box Hill ZS Augmentation NPR-000070	S	22.2	30.5	Yes	(F) Nov 26 (C) Nov 26	Jul 2025	0	6.89	1. Augment ZS 2. NNO
Capacity Increase for the Appin Growth Areas - Establish West Appin ZS NPR-000069	S	5.14	5.70	No	(F) Nov 28 (C) Nov 28	Jul 2026	0	80.84	1.New ZS Perm 2. New ZS staged build 2. NNO
Capacity Increase for the Gilead Growth Areas - Establish Mt Gilead ZS NPR-000049	S	8.0	3.27	No	(F) Nov 29 (C) Nov 29	Jul 2028	0	15	1.New ZS 2. NNO
Capacity Increase for the Catherine Fields Growth Areas - Establish Catherine Park ZS NPR-000054	S	15.9	17	No	(F) Nov 25 (C) Nov 28	Feb 2026	0	4.18	1. New Mobile ZS 2. New Staged ZS 3. New ZS 4. NNO
132kV Cable Constraints in the Parramatta area NPR-000533	S	93	121	Yes	(F) Nov 26 (C) Nov 26	Jul 2026	0	2.85	1. Cable Replacement 2. Advanced Power Flow Control(APFC) 3. NNO
Establish Austral ZS NPR-000053	S	50	68	No	(F) Nov 25 (C) Nov 26	Jul 2026	0	46.7	1. New ZS 2. Staged ZS 3. NNO
Establish Cambewarra TS-ZS NPR-000052	W	4.6	2.3	No	(F) Nov 29 (C) Nov 29	Mar 2027	0	16.6	1. New 11kV FDR 2. New ZS

Table 6: Identified Network Need – Retirement or Replacement projects

RIT-D Project Name	Retirement or Replacement Date	RIT-D Start Date	Retirement or Replacement Details
Parramatta area 132kV oil insulated cables	2029	Jul 2026	End of life oil filled cables 9J8, 22U, 22W, 226, 228 and 233.

Table 7 provides the RIT-D process timetable for each proposed project. Additional details for these RIT-D projects are provided in the DAPR Mapping Portal https://dapr.endeavourenergy.com.au.

Details are provided for each identified project including the constraint and the time frame over which a non-network investigation and program implementation would be expected to operate to successfully address the constraint.

If a screening test identifies that a non-network option is feasible then Endeavour Energy will issue a Non-Network Options Report. All registered participants on Endeavour Energy's register of interested parties will be notified of the release of the document.

If a screening test identifies that non-network options are not feasible, Endeavour Energy will publish a notice of the screening result on its website and all registered participants will be notified.

Table 7: RIT-D Projects Timetable

RIT-D Project Name	Constraint or Network Need	Timetable		Constraint
RIT-D Augmentation Projects				
Box Hill ZS Augmentation NPR-000070	Growth in the residential development area in addition to enterprise land use requiring augmented supply and connection capacity at the existing substation site.	Investigate Results Decision	Jul 2025 May 2026 Jun 2026	Nov 2028
Capacity Increase for the Catherine Fields Growth Areas - Establish Catherine Park ZS NPR-000054	New residential development area in the South-West Growth Area requiring increased supply and connection capacity.	Investigate Results Decision	Jul 2025 May 2026 Jun 2026	Nov 2028
Capacity Increase for the Appin Growth Areas - Establish West Appin ZS NPR-000069	Increase in residential development in the Appin area requiring increased supply capacity and connection capacity.	Investigate Results Decision	Jul 2026 Feb 2027 Jun 2027	Nov 2028
Capacity increase for the Gilead Growth Area - Establish Mt Gilead ZS NPR-000049	New residential development area in the Greater Macarthur requiring increased supply and connection capacity.	Investigate Results Decision	Oct 2026 Jun 2027 Oct 2027	Nov 2029
132kV Cable Constraints in the Parramatta area NPR-000533	Growth in the Parramatta CBD and surrounding areas requiring increased supply at 132kV into the area to support distribution.	Investigate Results Decision	Jul 2027 Feb 2028 Jun 2028	Nov 2029

Establish Austral ZS NPR-000053	Provide supply capacity and customer connection capability to the planned Austral development area to the north of Leppington.	Investigate Results Decision	Oct 2026 Jun 2027 Oct 2027	Nov 2029
Establish Cambewarra TS-ZS NPR-000052	Growth in the Bomaderry area requiring increased supply and connection capacity.	Investigate Results Decision	Jul 2027 Feb 2028 Jun 2028	Nov 2030
RIT-D Retirement or Replacement Projects				
Parramatta area 132kV oil insulated cables NTM-000009	End-of-life Replacement of aged oil filled cables supplying parts of the Parramatta area.	Investigate Results Decision	Jul 2026 Feb 2027 Jun 2027	Jun 2029

8.3 Projects That Do Not Meet the RIT-D Criteria

Endeavour Energy also plans to investigate non-network options for some network needs that are below the RIT-D threshold of $7 million. These are shown in **Table 8** below.

If a non-network option investigation identifies that a demand management option is feasible for a project below the RIT-D threshold, Endeavour Energy may issue a public tender document to provide interested stakeholders and service providers the opportunity to submit proposals to address the need. All registered participants on Endeavour Energy's register of interested parties will be notified when a tender document is issued.

Table 8: Identified Network Needs – Projects That Do Not Meet The RIT-D Criteria

Project Name	Critical Season	Existing Capacity (firm) (MVA)	2025/26 Demand Forecast (MVA)	Capacity Limitation Rating Reached	Limitation Date	Load Transfer Potential (MVA)	Required Load Reduction (MVA)	Potential Solutions
Augment Narellan ZS NPR-000058	S	70	80.9	Yes	(F) Nov 25 (C) Nov 25			1. Install switchboard 2. Install switching station 3. Replace transformer

Table 9: Investigation Timetable – Projects That Do Not Meet The RIT-D Criteria

Project Name	Constraint or Network Need	Timetable	Constraint
Augment Narellan ZS NPR-00005	Due to differing impedances between transformers at Narellan ZS, transformers cannot be paralleled, and load cannot be evenly shared across each transformer. Under certain outage scenarios, the load on a transformer will be exceed its capacity.	Investigate Results Decision	Dec 2026

8.4 Future Network Needs

Endeavour Energy's future network needs presented below are major supply requirements in the 5 to 10 year ahead planning period.

In the early stages of these developments the proposed timing is uncertain, however the estimated constraint date is based on the best available information. These identified future network needs are shown in Table 10.

Table 10: Future Network Needs

Project Name	High Level Description of Network Need	Estimated Constraint Date
Moreton Park Road ZS NPR-000061	Provide supply capacity and connection capability to the planned Menangle development area and the business parks to the south of Menangle	Nov-2031
West Bradfield City NPR-000007	Provide supply to the Bradfield City CBD	Nov-2031
Augment Guildford with 4th Transformer NPR-001223	Augmenting Guildford TS with a 4th 132/33kV Power Transformer	Nov-2031
South Agribusiness ZS NPR-000077	Provide supply capacity and connection capability to the planned Agribusiness precinct in close proximity to the Western Sydney Airport	Nov-2031
Establish Agribusiness North ZS NPR-000068	Supply capacity and customer connection capability in the Agribusiness North area of the Aerotropolis	Sep-2032
Establish Rossmore ZS NPR-000510	Supply capacity and customer connection capability in the Rossmore area of the Aerotropolis	Sep-2032
Holroyd BSP Augmentation NPR-001385	Managing Load at Risk on 93L and 93F exiting Holroyd	Sep-2032
Mount Vernon NPR-000805	Provide supply capacity and customer connection capability in the north Kemps Creek area	Nov-2032
Oran Park ZS Augmentation NPR-000957	Growth in the Oran Park area, including the further development of the town centre requires augmented supply capacity	Nov-2032
Nepean ZS Augmentation NPR-000055	Growth in the Nepean area requiring augmented supply capacity	Nov-2032
Collimore Park Liverpool Area NPR-000040	Growth in demand in the Liverpool CBD area will require an increase in supply and connection capacity	Nov-2032
Augment West Liverpool TS NPR-001389	Growth in demand in the Liverpool CBD area will require an increase in transmission supply	Nov-2032
Establish Science Park ZS NPR-000021	Supply capacity and customer connection capability in the Science Park area of the Aerotropolis	Nov-2032
Augmenting Guildford TS NPR-001223	Managing load at risk on existing Guilford TS	Nov-2032
New Tomerong BSP Works NPR-000074	Feeder/s establishment to Tomerong BSP	Dec-2032
New South Penrith ZS NPR-000047	Managing load at risk on existing Penrith ZS	Jun-2033
New Culburra Beach ZS	Growth in residential demand in West Culburra area	Jul-2033

NPR-000008		
Establish East Bradfield City ZS NPR-000948	Supply capacity and customer connection capability in the Bradfield City area of the Aerotropolis	Oct-2033
East Wollongong NPR-000062	Provide increase in supply capacity to the Wollongong CBD and surrounding areas	Nov-2033
North Wilton Area NPR-000955	Growth in the residential demand in the North Wilton and Appin areas will require an increase in supply capacity	Nov-2033
Holsworthy Area NPR-000041	Growth in the Holsworthy area residential demand will require increased supply capacity	Nov-2033
Augment Dundas ZS NPR-000974	Managing load at risk on existing Dundas ZS	Jun-2034
Establish Orchard Hills North NPR-000847	Supply capacity and customer connection capability in the Orchard Hills supply area	Jul-2034
Establish new Oakey Creek ZS NPR-000511	Supply capacity and customer connection capability in the Oakey Creek area of the Aerotropolis	Jul-2034
Nepean 132kV Feeder Constraints NPR-000994	Customer demand growth in the Nepean TS supply area. Insufficient 132kV supply capacity for Nepean area	Nov-2034
Bringelly ZS Augmentation NPR-000050	Growth in the Aerotropolis Core Precinct requiring augmented supply capacity	Nov-2034
Establish a new Westmead South ZS NPR-000065	Supply capacity and customer connection capability in the Westmead South Precinct	Nov-2034
West Dapto NPR-000013	Provide supply capacity and customer connection capability to support the Lake Illawarra development area	Nov-2035
Augment Eastern Creek ZS NPR-000771	Provide augmented supply capacity to the Eastern Creek enterprise area	Nov-2035
Augment North Leppington ZS NPR-000420	Growth in the Leppington Town Centre and Leppington North Precinct requiring augmented supply capacity	Nov-2035

8.5 Impact on Transmission – Distribution Connection Points

Table 11 details constraints in the network which impact on the capacity of transmission – distribution connection points.

Table 11: Transmission – Distribution Connection Point Constraints

Network Constraint	Constraint Date	Impact on Transmission-Distribution Connection Point
Under certain outage scenarios, Transgrid has modelled voltage issues and possible voltage collapse at Vineyard Bulk Supply Point	2025	Possible voltage collapse at Vineyard BSP for an outage of one Transgrid feeder to Vineyard BSP.
Connection of additional load overloads Feeder 9L1 and Macarthur 330/132KV transformer in contingency situations.	2025	Macarthur 330/132kV transformer will be overloaded.
Connection of major customers and additional load to Sydney West Bulk Supply Point will cause Sydney West BSP to exceed firm capacity in future	2025	Firm capacity at Sydney West exceeded, followed by installed capacity exceeded 3-4 years later.
Connection of major customers and additional load to Holroyd Bulk Supply Point will cause Holroyd BSP to exceed firm capacity	2025	Firm capacity at Holroyd will be exceeded.

8.6 Primary Distribution Feeders

As required by clause (d) of Schedule 5.8 of the National Electricity Rules, Endeavour Energy has identified primary distribution feeders that are either currently experiencing an overload situation or forecast to exceed their normal cyclic rating within the next two years. For these feeders, Endeavour Energy provides:

- The location of the primary distribution feeder and the extent to which demand exceeds, or is forecast to exceed, 100% of the normal cyclic rating (240A), or a lesser percentage where maximum utilisation factors are applied under normal conditions during summer and/or winter periods;
- Types of potential solutions considered, including non-network options, network augmentation, network reconfiguration (switching and load transfers), or monitoring where constraints are not significant;
- Estimated demand reduction required to defer the constraint for 12 months, including timing (year and month), relevant connection points, and the reduction amount.

Endeavour Energy employs a utilisation factor of 80% for the distribution feeder cables exiting a zone substation to allow 20% of the thermal rating of the feeder to be available for transfer of load from an adjacent feeder under first level emergency conditions

Details of Endeavour Energy's primary distribution feeders can be located in the DAPR mapping portal https://dapr.endeavourenergy.com.au, which provides an interactive view of affected feeders, forecast constraints, and associated data.

8.7 Other Factors Impacting Network Needs and Solutions

There are a number of factors that are impacting network needs and solutions that go beyond the traditional and well-established business as usual practices of operating the network.

Each of these factors are further discussed below.

8.7.1 The evolving grid within a low carbon economy

Governments, businesses, and communities are committing to increasingly ambitious emissions reduction targets to mitigate the impacts of climate change. Achieving these goals requires a fundamental transformation in how energy is produced, delivered, and consumed. Electricity networks will play a pivotal

role in enabling this transition, and Endeavour Energy is committed to evolving its infrastructure and capabilities to keep pace with these changes.

In the coming years, our network must accommodate for the rapid uptake of clean and distributed energy resources such as solar PV, battery storage, and electric vehicles. As our customers take up these technologies, they will participate more actively in the energy market and unlock greater value from their investments. To support this, we are strengthening the network by deploying advanced technologies that provide real-time visibility and control, including smart metering and low-voltage monitoring systems. These capabilities enable accurate demand forecasting, proactive asset performance management, and dynamic operating envelopes to integrate distributed energy resources efficiently and maintain reliability as the energy system evolves.

Sophisticated digital platforms will increasingly underpin and automate more responsive users, coordinated by energy 'aggregators' such as virtual power plants. These systems will support real-time optimisation of energy flows, helping balance supply and demand, maintain voltage stability, and improve overall network efficiency. By leveraging advanced analytics and automation, they will reduce reliance on traditional infrastructure upgrades, enhance resilience, and ensure the network can accommodate dynamic, bi-directional energy flows in a cost-effective and sustainable manner.

The introduction of new technologies and the shift in how communities choose to use and share electricity will fundamentally change the role of the network. To ensure a smooth transition, education and awareness will be critical—helping customers and third parties understand how to integrate these technologies into everyday energy use. Open, real-time data sharing will enable and incentivising active participation in balancing the system. As the network evolves into a platform for energy exchange, it will not only support a modern, low-carbon lifestyle but also empower communities to play an informed and collaborative role in shaping the future energy system.

8.7.2 Data Centre Developments

There has been a significant surge in the development of large-scale data centres within Endeavour Energy's network, particularly across Western Sydney and extending into the Southern Highlands. These facilities, driven by rapid growth in cloud computing, artificial intelligence, and streaming services, are creating unprecedented electricity demand.

This step change is occurring at a pace far faster than traditional network augmentation cycles, presenting challenges for both distribution and upstream transmission networks, as well as generation planning. Many proposed data centres are located in greenfield areas with limited existing capacity, requiring substantial investment in new substations, feeders, and high-voltage infrastructure.

Endeavour Energy is responding through proactive engagement with data centre proponents, government agencies, and transmission partners to deliver scalable solutions. This includes planning and constructing new high-capacity supply routes, upgrading substations, and reinforcing network capability to support future demand.

8.7.3 Solar Photovoltaic (PV) Generation

The uptake of Solar PV systems by households and businesses on Endeavour Energy's network is forecast to increase rapidly in the coming years. Currently, more than 29% of Endeavour Energy's customers have installed Solar PV systems to supplement their energy requirements. By 2030, this figure is projected to reach 55%.

The increasing penetration of solar PV is altering the demand profile, creating both network-wide and localised challenges. At the network level, this includes the emergence of the "duck curve," where high daytime solar generation significantly reduces electricity demand during daylight hours, while concurrent growth in electricity consumption drives elevated evening peak demand.

High penetration of rooftop solar PV is impacting supply quality across the network. Traditional distribution systems were designed for one-way power flows from HV to LV, but reverse flows now occur during peak solar generation and low demand periods. This creates unpredictable voltage rise and drop conditions that must be managed simultaneously to maintain statutory voltage limits at customer premises.

Endeavour Energy addresses these challenges through targeted investments in voltage regulation equipment, reactive power management, network augmentation, advanced monitoring systems, and customer-side solutions such as smart inverter settings and export controls.

8.7.4 Battery Energy Storage Systems

As more variable renewable energy sources feed into the grid, such as solar PV, energy storage will play an increasing and crucial role to balance supply and demand. As costs of battery energy storage technology decline the installation of battery storage is expected to increase rapidly across our network.

Storage will be delivered at the household, local and grid-scale, and will be a vital contributor to the management of seasonal, daily and micro variations in supply and demand. These services can only be delivered via the active participation of customers and third parties, which requires a dynamic and digital capability and necessitates the more central role of the grid.

Household

As the costs of battery storage decline, more customers are choosing to install privately-owned, behind the meter storage systems. In its simplest use, battery storage allows customers to store the solar energy otherwise fed into the grid during the day and consume that energy at night when it is needed. Recent government rebates further reduce the upfront cost, making battery storage more accessible and financially attractive for households and businesses.

Grid-scale

At the system level, a range of energy storage technologies—from Battery Energy Storage Systems (BESS) to Seasonal Hydrogen Storage—are becoming increasingly viable for supporting the electricity network. These solutions enable distributors to better balance supply and demand, improve reliability, and defer costly network augmentation. Community batteries, deployed across Endeavour Energy's network with support from DCCEEW and ARENA, provide shared storage for households, relieve local network constraints, and increase hosting capacity for distributed energy resources, further enhancing grid resilience and flexibility. 2.15MW have been installed across 58 batteries as part of the community battery programs as of December 2025.

Aggregation and Virtual Power Plants (VPPs):

Advanced digital platforms and energy aggregators, such as Virtual Power Plants (VPPs), enable households to participate in wholesale energy markets by leveraging Battery Energy Storage Systems (BESS). This integration allows BESS to respond to market price signals and provide grid services. However, coordinated responses by BESS can create localised network capacity constraints, as the supply and demand movements may not align with the limitations of the local distribution network.

8.7.5 Electric Vehicles

The electrification of transport will have a profound impact on the distribution network due to the large increase in demand. Unlike other step changes in electrical load, electric vehicles, are unique in their ability to be flexible and bidirectional. While electric vehicles will increase demand, they also have the potential to provide network support, both through acting as a solar sponge to combat rising voltage from solar and to provide support to the network during periods of peak demand through vehicle-to-grid technology.

Electric vehicle ownership is growing rapidly in the Endeavour Energy network with Western Sydney exhibiting some of the fastest uptake in EV ownership over the last 12 months. There are approximately 31,124 electric vehicles in the Endeavour Energy network equating to 146% growth since June 2024. By 2030, we are expecting up to 300,000 electric vehicles in our network. This means

767GWh of aggregate load and the need for at least 15,000 public electric vehicle charging stations to support these charging needs.

To support the expected customer uptake of electric vehicles, we have set key strategic priorities with respect to the electrification of transport: 1. Ensuring the network is EV ready and 2. Facilitating more EV charging infrastructure.

Ensuring the network is EV ready

We need to ensure our network is ready and that we optimise network investment to support the increased load and impact on peak demand. We are currently investing in several areas to ensure network readiness of transport electrification, these include:

Network data uplift programs will ensure we (and our customers) have better network visibility for better network planning and investment. For example, we recently released low voltage network capacity map available to CPOs, ASPs and councils to assist them in identify opportunities for deployment of EV charging stations. We are also using an improved hosting capacity analysis tool to identify where network improvements, such as STATCOMs, augmentation, or community batteries, may be required to support additional load.

Further visibility from smart meter data provides insights into consumption patterns, helping us target investments effectively and ensure the network can reliably accommodate emerging technologies and increased electrification.

Facilitating more EV Charging Infrastructure

Endeavour Energy plays a key enabling role in the installation of more EV charging stations in our network through process improvements, unlocking network capacity and making available our network infrastructure.

Our partnerships with EVX, Jolt and Electric Future enable EV charging infrastructure to be installed on Endeavour Energy network infrastructure such as power poles and distribution substations. We are also exploring alternative models which will allow us to better meet our future customer needs with respect to accessibility, affordability and reliability of EV charging infrastructure.

We are also exploring flexible connections to unlock additional network capacity to enable the connection of more EV charging infrastructure. The inherent flexibility of EV charging and our improvement in network visibility will allow us to optimise utilisation of network infrastructure. More load passing through our network will result in reduced system costs and lower cost of energy served to customers.

8.7.6 Demand response and flexible demand

Historically, grid capacity management has focused on generation to ensure supply meets demand. However, evolving consumer behaviour presents opportunities to manage capacity by influencing demand. Transitioning to dynamic and transparent tariff structures will incentivize flexible consumption patterns. In a system dominated by variable renewable energy, households and businesses can benefit by reducing demand or shifting operations to align with periods of abundant supply, supporting system balance and decarbonization objectives.

Demand Response refers to the voluntary reduction or shift in electricity use, typically achieved through financial incentives to move consumption to off-peak periods, easing network stress. Flexible Load involves coordinating existing loads such as water heaters, air-conditioning, and pool pumps for households, and flexible production schedules for businesses, reducing costs and balancing network loads.

Endeavour Energy's Actions

To enable customer participation and support demand flexibility, Endeavour Energy is implementing the following measures:

- Tariff Reform: Introducing cost-reflective and capacity-based pricing structures to encourage demand-side flexibility.
- Advanced Metering Infrastructure (AMI): Deploying smart meters to provide real-time consumption data and enable dynamic pricing.
- Demand Management Programs: Offering incentives for residential and commercial customers to reduce peak demand.
- DER Integration: Implementing Distributed Energy Resource Management Systems (DERMS) to coordinate flexible loads and distributed generation.
- Aggregator Collaboration: Working with Virtual Power Plants (VPPs) and energy aggregators to align orchestrated actions with network constraints.
- Customer Engagement: Delivering education and support programs to promote awareness and uptake of flexible demand solutions.

This approach shifts the network's value proposition toward enabling participation and flexibility rather than simply delivering energy, requiring a re-think of tariff structures to reflect capacity and service value.

8.7.7 Large Scale Renewable Energy Generation

Decarbonising Australia's economy will be challenging, involve a variety of alternative fuels developed through multiple different pathways, and approaches will vary within and across industries and use cases based on needs and opportunities. Hydrogen, which is very similar to natural gas and can be produced from renewable electricity, represents one such option.

The NSW Government through its Electricity Infrastructure Roadmap and Hydrogen Strategy is aggressively pursuing the activation of new renewable energy zones to drive decarbonisation of its electricity generation and establishment of a hydrogen industry, for both domestic and export markets. This will drive significantly more variable renewables into the generation mix and may add considerable load to the distribution network.

The scale of electricity generation associated with large-scale hydrogen production dwarfs that of Australia's current demand. NSW is targeting 12GW of renewables to deliver 110,000 tonnes per annum of hydrogen by 2030. It is focusing on production in two key hubs, Illawarra and the Hunter Valley (with Wagga Wagga considered a strategic location mainly for transport).

The wave of renewables will create system challenges, but also new opportunities. Hydrogen may act as a flexible way to lift minimum demand and store excess energy. It may also play a role in decarbonising gas networks, with localised production, storage and potentially generation, supporting grid stability.

While the commercial pathway for large-scale hydrogen production remains in its early stages, Australia must prepare for multiple scenarios, from widespread electrification to the emergence of a hydrogen economy, given the uncertainty around cost competitiveness and infrastructure readiness.

8.7.8 Microgrids and Stand-Alone Power Systems

Microgrids and Stand-Alone Power Systems (SAPS) are essentially a group of localised energy sources and loads that can function autonomously in times of need. Thus, they require less or no connection to the traditional electricity network, mitigating the need for new, or significant augmentation or replacement of existing, connections to communities. The transformation of the grid will lead to a more 'compartmentalised' network, with many localised networks functioning like microgrids, and interacting in a broader system.

The increasing value that can be derived from microgrids and SAPS is two-fold. Firstly, with the decreasing cost of distributed generation and storage technologies, as well as the increasing costs of providing traditional network connection, SAPS are becoming more commercially feasible. Secondly, and in addition to the potential commercial value, SAPS can avoid the need for long, stringy connections. In the face of increasing extreme weather events, this will reduce the risks to the safety and reliability of the network.

In addition to these two benefits, microgrids can offer communities a chance to help co-design their energy system, specifically creating elements for their unique values and needs. Endeavour Energy has launched the first community microgrid of its kind in NSW on the state's South Coast. The community microgrid, funded with contributions from the Australian and NSW Governments' Bushfire Local Economic Recovery Fund, acts as a self-contained energy system harnessing electricity from renewable sources that include around 100 subsidised home-based batteries, rooftop solar and a 3-megawatt battery located between the two towns.

For Endeavour Energy, microgrids present new opportunities to deliver growth and replace assets more affordably, with lower risks. With a huge range of different areas for our network to cover, and that creates many different challenges for both existing locations and newly developing areas, designing and maintaining a network that is safe and reliable, but also makes best use of all locally generated renewable energy is what we are striving to achieve with microgrids.

However, any use of SAPS and microgrids will need to align with the guidance from the AEMC and AER regarding appropriate distributor-led use.

8.7.9 Asset Ratings

Endeavour Energy investigates potential cyclic or emergency rating of assets to identify the actual capacity of the network and to accurately forecast the emergence of constraints. This ensures optimal utilisation of existing network assets and presents opportunities for deferral of investment in augmentation of the network.

8.8 Embedded Generation Connections

Our non-network option consultation process will provide an opportunity for embedded generation proposals to be submitted and considered for each constrained location.

During 2025 up to the end of October, we received 777 applications for non-micro embedded generator connections and 35,757 micro embedded generator connection applications. We had an average turnaround time for micro embedded generator applications of less than 1 day.

As of October 2025, there was a total of 326,852 PV generators connected to Endeavour Energy's network with a total combined capacity of over 2.5MW.

There were no significant issues recorded as arising from the connection of these generators to Endeavour Energy's network.

9.0 Planned Investments and Evaluation

This section provides an overview of planned network investments, non-network programs and trials, asset replacement initiatives and IT investments that were planned in the previous year. Evaluation of screening tests and RIT-D outcomes are also detailed below.

9.1 Public Consultation for our Major Investments

The public consultation for our major network investments occurs through the RIT-D process which includes the issuing of the following reports:

- Non-Network Options Report (NNOR);
- Draft Project Assessment Report (DPAR); and
- Final Project Assessment Report (FPAR)

9.1.1 Screening for Non-Network Options

Non-network options aim to deliver efficient and sustainable outcomes by leveraging distributed energy resources, battery storage, and demand-side flexibility to defer or avoid traditional network augmentation while improving system resilience and customer value.

Endeavour Energy investigates non-network options as part of planning for major network augmentations and asset replacements. This includes determining whether non-network options will be technically and economically feasible in deferring or avoiding network investments and also to utilise market and public consultation in sourcing possible non-network options.

In support of this determination Endeavour conducts feasibility testing of non-network options using the New Technology Master Plan (NTMP) tool.

When screening for non-network options Endeavour Energy considers the following:

- Any measure or program targeted at reducing peak demand, including:
  - Improvement to or additions of automatic control schemes such as direct load control and air conditioner cycling;
  - Energy efficiency programs that target appliances that contribute to peak demand;
  - The installation of smart meters to accommodate a demand response program;
  - Existing load transfer capacity;
  - Installation of technology capable of reducing peak demand; and
  - Load curtailment, load shifting or demand response
- Increased local or distributed generation/supply options including:
  - Capacity for standby power from existing or new embedded generation;
  - Capacity of micro embedded generation; and
  - Capacity of energy storage systems.

Endeavour Energy understands that credible solutions may include a variety of different measures combined to form one integrated program when determining whether a non-network option could constitute or be part of a credible option.

In determining the feasibility of a non-network option, the analysis focuses on the following areas:

- The ability to address the identified need in terms of the level and timing of demand reduction;
- Commercial and technical feasibility;
- Implementation timeframe to meet the network need.

9.1.2 Options Screening Tests

The network needs and investments screened for non-network options during 2025 are shown in Table 12 below.

Table 12: Non-network Options Screening Outcomes

Network Need	Description of Network Need	NNOR Publication Date	Load reduction required (MVA)	Timing of constraint	Options Screening Test Result	Deferral Years
Providing increased supply capacity to the Menangle Development Area	Provide supply capacity and customer connection capability to support the development of the Menangle Development Area	March 2025	28.2	FY27	Non-network options deemed not feasible. Screening Notice published – no submissions received	2 years
Providing increased supply capacity to the Box Hill Development Area	Provide increased supply capacity to the Box Hill Development Area	November 2025	28.0	FY28	Non-network options deemed feasible. Non-network Options Report Published – In consultation	1 year

9.1.3 Options Screening Test Result Details

The following section summarises the screening test results.

9.1.3.1 Supply to the Menangle Development Area

The Non-Network Options Screening Report for the Menangle Development Area concluded that no non-network solution could fully meet the identified need for additional capacity. While options such as behavioural demand response, battery storage, and embedded generation were assessed, they were found insufficient or impractical due to scale, cost, and locational constraints. As a result, the RIT-D process progressed to evaluating network augmentation, with the preferred solution involving staged construction of new zone substations to address forecast load growth and maintain reliability standards

9.1.3.2 Firming supply to the Box Hill Development Area

We are currently in the RIT-D consultation process for this project and seeking proposals for credible non-network solutions to address identified needs. For the Box Hill Zone Substation, a behavioural demand response option has been identified as a credible solution that could defer network investment by one year. Other emerging technologies, such as grid-connected batteries and DER integration, may provide complementary benefits like improved voltage management and system flexibility but not necessarily defer the need for network investment.

9.2 Summary of Draft Project Assessment Reports

The Draft Project Assessment Reports (DPAR) that were published in 2025 in accordance with the RIT-D regulatory requirements are detailed in **Table 13**below.

Table 13: Draft Project Assessment Reports

Network Need	Description of Network Need	Preferred Option in the Draft Project Assessment	Status	Notice Date
Providing increased supply capacity to the Menangle Development Area	Provide supply capacity and customer connection capability to support the development of the Menangle Development Area	Proposed Establishment of Stage 1 of the Menangle Park Zone Substation in close proximity to the development area.	Published	March 2025

9.3 Summary of Final Project Assessment Reports

9.3.1 Summary of Final Project Assessment Reports

The Final Project Assessment Reports (FPAR) that were published in 2025 are detailed in **Error! Reference source not found.** below.

Table 14: Final Project Assessment Reports

Network Need	Description of Network Need	Preferred Option in the Final Project Assessment	Status	Notice Date
Providing increased supply capacity to the Riverstone East and Schofields Development Area.	Provide increased supply capacity to the Riverstone East and Schofields Development Area.	Proposed Establishment of the Grantham Farm Zone Substation in close proximity to the development area.	Published	May 2025
Providing increased supply capacity to the Menangle Development Area	Provide supply capacity and customer connection capability to support the development of the Menangle Development Area	Proposed Establishment of Stage 1 of the Menangle Park Zone Substation in close proximity to the development area.	Published	May 2025
Providing supply to the South Creek West Residential Growth Area.	Provide supply capacity and customer connection capability to support the development of the South Creek West Residential Growth Area.	Proposed Establishment of the Lowes Creek Zone Substation in close proximity to the growth area.	Published	June 2025

9.4 RIT-D Projects Completed or In Progress

9.5.1 Projects in Progress

Table 15 below provides a summary of the RIT-D projects which are currently in progress.

Table 15: RIT-D Projects in Progress – Summary

RIT-D Project	RIT-D Status	Cost of Preferred Option ($M)	Construction Timetable	Credible Options
Provide increased supply capacity to the Box Hill Development Area	The OSR will be open until February 2025.	51.4	FY27-FY28	Augment Box Hill Zone Substation to firm 45MVA with 132kV feeder from Mungerie Park ZS

9.5 RIT-D Projects with Public Consultation Completed

The consultation process for RIT-D projects where a Final Project Assessment Report was issued in the preceding year (2025) and have cleared their dispute resolution period are complete. These projects are detailed in **Table 16**.

Table 16: RIT-D Projects Completed – Summary

RIT-D Project	Cost of Preferred Option ($M)	Planned Commissioning Year	Preferred Option	Net economic Benefit ($M)
Providing increased supply capacity to the Riverstone East and Schofields Development Area.	53.8	FY27	Establishment of Grantham Farm Zone Substation with 1 x 45MVA transformer to increase supply capacity to Riverstone East and Schofields development area	51.0
Providing increased supply capacity to the Menangle Development Area	39.9	FY28	Establish Menangle Park Zone Substation with 2 x 35MVA and new 66kV feeder from Macarthur BSP to increase supply capacity to the Menangle Development Area	448.0
Providing supply to the South Creek West Residential Growth Area.	45.0	FY27	Establishment of Lowes Creek Zone Substation with 2 x 45MVA transformers to supply the South Creek West residential growth area	52.7

9.6 Active Non-Network Programs and Trials

Endeavour Energy had the following non-network programs and trials active during 2025:

- PowerSavers
- Bawley Point & Kioloa Community Microgrid
- Gridsight

These are summarised below.

9.2.1 PowerSavers

The PowerSavers program, designed and implemented by Endeavour Energy, is a comprehensive suite of customer technology applications and services to manage demand and other network constraints.

The PowerSavers program for residential customers has been established to manage a range of smart load devices including air-conditioning units, water heaters, EV chargers and assets comprising solar and battery unit combinations.

The purpose of this specific program is to provide customers with maximum choice by including an expanded list of devices compared to those included in earlier programs.

One of the outcomes of earlier demand management programs was the need for a more comprehensive and complete product which comprises full integration of a customer engagement application, software applications to fully manage the customers' end devices and configurable customer notifications to provide customer flexibility to opt out of Event days or join more programs with a wide range of customer incentives.

The scope of the project also comprises comprehensive data reporting functionality to measure the customer and network benefits progressively through the trial and at completion.

The aims of the PowerSavers program are as follows:

- Efficiently manage the demand management programs for residential customer smart load devices including air-conditioning units, electric water heaters, EV chargers and assets comprising solar and battery unit combinations.
- Provide analysis:

- To understand customer behaviour and anticipate the impact of demand management programs to incentives; and
- On the impact of demand management programs to the distribution network to support the efficient deployment of non-network solutions.

The outcomes include:

- Well-developed understanding of participants' interest in the program and the penetration of controllable devices across the Endeavour Energy network;
- Capturing actual/estimated energy reduction per customer and the prevailing weather conditions during Event days;
- Confirming average and total energy reduction for all participants;
- Identifying any issues captured during the Event period including those who discontinued their participation and archiving of all raw data collected; and
- Suitability of the application to be applied more widely across the Endeavour Energy network to manage system demand efficiently with our existing network support resources and services.

We are expecting to conclude the PowerSavers program in the near future and will provide a report on its outcomes and conclusions in our related regulatory reporting under the Demand Management Innovation Allowance (DMIA) program.

9.2.2 Bawley Point & Kioloa Community Microgrid

The Bawley Point, Kioloa and Termeil communities are located at the extreme southern end of Endeavour Energy's franchise area. The area is a popular tourist destination, and this means that energy demand can increase four to five-fold during peak holiday periods. Being at the very end of the Endeavour Energy network, electricity services at Bawley Point and Kioloa experience relatively high SAIDI and SAIFI values. Load has also increased to near capacity with regional permanent population movements, in part due to COVID-19. Additionally, the network is voltage constrained – facing low voltage during peak periods, and high voltage during the low demand periods, which will in the longer-term result in poor power quality and curtailment of customers' DER.

To assist in addressing emerging network needs, Endeavour Energy had previously installed a 1MVA diesel generator between Bawley Point and Kioloa to supplement the existing network, but this solution faces ongoing operational costs and is aging. The largest customer in the network is Willinga Park, who have privately installed a considerable amount of behind the meter generation assets (including solar PV/battery/diesel generators) to allow for standalone operation. Currently only the PV system exports into the network, with the remaining assets only providing a back-up supply for the facilities (or zero export peak demand reduction).

The increasing capabilities and viability of DER - both at a residential and community level - have since made an alternative new technology solution credible when compared to a traditional network solution. This alternative solution would involve the development of a microgrid, with elements co-funded and co-designed with the community.

The major features of the project involve:

- Community co-design, and integration of community owned assets;
- Turnkey supply and installation of a new ~3MVA/3MWh Battery Energy Storage System (BESS);
- Roll out of residential batteries and solar (funded through the NSW Government's Bushfire Livelihoods Economic Recovery program);
- A Distributed Energy Resources Management System (DERMS) to enable control of local generation and storage; and
- Demand management programs (smart streetlights, smart metering and Off-Peak Plus), and the integration of larger customer assets to assist in supporting the network.

The aims of the program include:

1. Address the vulnerability of the Bawley Point and Kioloa communities' network reliability and resilience, and to address the growing demand requirements;
2. Demonstrate new planning approaches, including how we can partner and work closely with our customers and communities, and utilise participatory design processes;
3. Accelerate decarbonisation, through accessing and incentivising sustainable and renewable energy in our network;
4. Establish the first microgrid in Endeavour Energy's network as a new technology solution for edge-of-grid customers, and apply learnings to opportunities in diverse and metropolitan environments; and
5. Develop a cornerstone project that combines multiple Future Grid technologies such as DERMS, VPPs and community-scale grid batteries.

9.2.3 Gridsight

Endeavour Energy is collaborating with Gridsight to develop a platform capable of providing tools to enhance LV visibility and leverage AI to generate data-driven insights surrounding network performance, CER detection and Safety Hazard detection.

As customers seek to connect more customer energy resources (CER) and increasingly use sophisticated digital platforms, the network and its management must evolve. Endeavour Energy's objective is to enable customers' energy choices for a sustainable future, moving us towards the future integrated and low carbon energy system. Low Voltage Visibility and Analytics is one of the key enablers of this objective.

Gridsight's analytics platform utilises customers' meter data to provide visibility of and insights on, existing and emerging constraints, which enables a better understanding of customer usage patterns, improved tariff designing processes, and better consideration of non-network solutions to demand management. This bottom-up approach places the customer as the focus.

The platform ingests smart meter market data from some 416,000 sites. From this population, Endeavour Energy is purchasing power quality data of approximately 50,000 sites. Basic meter data is ingested for all other customers.

The Gridsight platform aims to serve the following use cases:

- Provide optimal data-driven Dynamic Operating Envelopes (DOEs) to unlock additional hosting capacity without the need for network investment.
- Provide load estimation tools to help proactively identify equipment capacity issues through aggregating downstream customer data and creating data-driven estimates.
- Identify and validate customer energy resources including customer solar PV, battery storage systems and electric vehicle chargers to increase compliance efforts and minimise network spend.
- Detect customer energy resource performance including analysis on self-consumption of solar, detection of inverter disconnections and solar curtailments due to overvoltage issues and network voltage unbalance.
- Proactively identify safety issues on the network including broken neutral connections such that they can be rectified.

9.7 Asset Replacements and Potential Regulatory Investment Tests

9.7.1 Asset Replacements (Project Based)

Endeavour Energy has a range of project based planned asset retirements which will result in a system limitation or de-rating. **Table 17** below summarises these planned asset replacements for the forward planning period. Some of these needs may be addressed by options that are yet to be determined, and which could trigger the requirement to undertake a RIT-D assessment.

Table 17: Asset Retirements (Project Based)

Reference	Asset	Location	Rationale for Retirement	Replacement Date	Change to Replacement Date
NTM-000535	132kV oil insulated cables	Guildford/Merrylands/ Parramatta	Sheath oil leaks and dissolved gas levels indicating end of life of the cables: 9J8, 22U, 22W, 226, 228, 233.	2026/27-2029/30	No.
NTM-000514	Wollongong - Port Kembla copper pilot cables	Wollongong – Port Kembla	Increased experience of failures at joint boxes leading to failures of the high speed 33kV feeder protection schemes. Risk to public safety due to slow clearing of feeder faults.	2029/30	No.
NTS-000441	Carlingford Transmission Substation control building replacement	Carlingford	Failure of roof of control building. Deterioration of protection and control services. Asbestos contamination of control building. Risk of loss of protection and control. WH&S risks.	2024/25	Yes. Project work commenced following RIT-D completion.

9.7.2 Asset Replacements (Program Based)

The following list of programs will result in the retirement of various asset types across the Endeavour Energy network. The rationale for the retirement for some asset classes is defined by an economic evaluation in a case for investment and for other asset classes by Endeavour Energy Standards which set out conditions and health indices used to determine the need for the retirement of those assets.

Table 18: Asset Replacements (Program Based)

Reference	Asset	Location	Rationale for Retirement	Replacement Date	Change to Replacement Date
NAU-001072	Substation SCADA Remote Terminal Units	Zone and sub-transmission substations	Increasing likelihood of failures leading to loss of control o the substation. Reliability risk.	2024/25 - 2030/31	No.
NDM-000053	Distribution poles	Across the network	Inspection and test criteria indicating risk of failure Safety risk to the public. Reliability risk.	2024/25 - 2030/31	No.
NDM-000076	LV service wires	Across the network	Deterioration of insulation. Safety risks to public and electricity workers.	2024/25 - 2030/31	No.
NDM-000066	LV underground cable network	Across the network	Failures of in-ground joints. Shock hazards to customers and electricity workers.	2024/25 - 2030/31	No.

NDS-000055	Distribution ground substations	Across the network	Poor condition of the substation assets. Safety risks due to exposure of conductors and inadequate clearances.	2024/25 - 2030/31	No.
NDS-000078	MD4 epoxy switchgear	Distribution substations across the network	Discharge over surface of resin. Risk of flash-over and substation fire. Safety risk to the public and electricity workers.	2024/25 - 2030/31	No.
NDS-000101	Low voltage switchgear	Distribution substations across the network	Insulation deterioration leading to arc-flash incidents. Safety risk to electricity workers.	2024/25 - 2030/31	No.
NDM-000093	OH Switchgear	Across the network	Failure of switchgear resulting in inability to be operated. Safety risks to electricity workers and the public.	2024/25 - 2030/31	No.
NDM-000448	Air break switch	Across the network	Failure of switchgear resulting in inability to be operated. Safety risks to electricity workers and the public.	2024/25 - 2030/31	No.

NDM-000203	HV ABC	Across the network	Deterioration due to UV exposure. Reliability risk.	2024/25 - 2030/31	No.
NPS-000017	Substation protection relays	Zone and sub-transmission substations	Increased risk of malfunction. Reliability risk. Safety risk to the public.	2024/25 - 2030/31	No.
NTM-000023	Sub-transmission poles	Across the network	Failure of inspection and test criteria with risk of failure. Safety risk to the public. Reliability risk.	2024/25 - 2030/31	No.
NTM-000902	Sub-transmission steel towers	Across the network	Corrosion of steel structures indicating risk of failure. Safety and reliability risk.	2024/25 - 2030/31	No.
NTM-000002	Corroded overhead steel earthwires	Across the network	Corrosion of steel earthwire indicating risk of failure. Bushfire start risk. Safety risk to the public. Reliability risk.	2024/25 - 2030/31	No.
NTS-000470	132kV circuit breakers	Zone and sub-transmission substations	Poor diagnostic test results and defect history indicating destructive failure risk. Reliability and safety risk.	2024/25 - 2030/31	No.

NTS-000023	66kV circuit breakers	Zone and sub-transmission substations	Poor diagnostic test results and defect history indicating destructive failure risk. Reliability and safety risk.	2024/25 - 2030/31	No.
NTS-000006	33kV circuit breakers	Zone and sub-transmission substations	Poor diagnostic test results and defect history indicating destructive failure risk. Reliability and safety risk.	2024/25 - 2030/31	No.
NTS-000472	11kV circuit breakers	Zone and sub-transmission substations	Poor diagnostic test results and defect history indicating destructive failure risk Reliability and safety risk	2039/40	No.
NTS-000108	Transmission substation oil bunds	Transmission substations	Leakage of transformer oil due to bund deterioration. Environmental risk and safety risk.	2024/25 - 2030/31	Deferred due to reassessment of risk.
NTS-000098	Transmission substation fences	Transmission substations	Corrosion and aging of fences. Safety risk to the public.	2024/25 - 2030/31	No.
NDM-001068	Pits, Pillars & Cubicles	Across the network	Deterioration and aging. Reliability risk. Safety risk to the public.	2024/25 - 2030/31	No.

NCC-000014	Communications Assets	Across the network	Increased failure rate, obsolete technology and limited vendor support. Reliability and safety risk.	2024/25 - 2030/31	No.
NDS-000066	Distribution Transformer	Across the network	Aging, corrosion and non-compliant voltage. Reliability and public safety risk	2024/25 - 2030/31	No.
NTS-000078	Substation batteries	Zone and sub-transmission substations	Deteriorating test results. Risk of failure and loss of protection systems at the substation. Reliability risk as substation is remotely switched off until battery is replaced and control restored.	2024/25 - 2030/31	No.
NTS-001394	Auxiliary switchgear	Zone and sub-transmission substations	Risk of catastrophic failure. Reliability and safety risk.	2024/25 - 2030/31	No.
NTS-000137	Surge arresters	Zone and sub-transmission substations	Breakdown of seals on porcelain housing, moisture ingress leading to failure. Reliability and safety risk.	2024/25 - 2030/31	No.
NTS-001395	VT and CTs	Zone and sub-transmission substations	Oil leaks, degradation of seals, corrosion leading	2024/25 - 2030/31	No.

			to risk of destructive failure. Reliability and safety risk.		
NTS-000137	Busbars, disconnectors and/or support structures	Zone and sub-transmission substations	Corrosion of reinforcing steel and cracking of support insulators indicate risk of failure. Reliability and safety risk.	2024/25 - 2030/31	No.
Various Projects	Switchboards	Zone and sub-transmission substations	Persistent SF-6 gas leaks and mechanical faults. Value of Emission Reduction. Reliability and safety risk.	2024/25 - 2030/31	No.
Various Projects (ZS level project references)	11kV oil circuit breaker trucks	Zone substations	Risk of failure to clear faults leading to catastrophic failure. Reliability risk. Safety risk for electricity workers.	2024/25 - 2030/31	No.
NTS-000105	Substation roof	Zone and transmission substations and switching stations	Corrosion, cracking or distortion of the roof structure and coverings. Reliability and safety risk.	2025/25-2030/31	No.
NTS-001069	Power transformers	Zone and sub-transmission substations	Poor paper insulation, bushing and tap changer condition, oil condition indicates risk of failure. Reliability risk.	2024/25 - 2030/31	No.

9.8 Urgent and Unforeseen Investments

There are currently no issues which are sufficiently urgent or unforeseen that they have not been able to be addressed through the normal investment planning process.

Table 19: Urgent and Unforeseen Network Issues

Project Number	Project Name	Description Purpose	Estimated Cost ($m)	Approval Date	Completion Date	Alternative Options

9.9 Information Technology Investment

Endeavour Energy's network is evolving to meet growing customer expectations and regulatory requirements, making technology investment essential. Digital solutions such as advanced asset management systems, predictive analytics, and smart grid technologies enable safer, faster, and more efficient works delivery. These tools improve outage response, optimise resource planning, and support integration of distributed energy resources, ensuring reliability and sustainability across the network. Strategic technology investment is key to maintaining operational excellence and futureproofing the business.

Table 20 provides information on the investment in information technology systems within the network for the preceding year and that proposed for the forward planning period.

Table 20: Information Technology Program

Project Name	Period	Description
Field Service Management Transformation	2024/2025 onwards	This program aims to transform Endeavour's field service operations, enhancing the way we work and deliver value to our customers. By automating and streamlining workflows for scheduling, dispatching, and tracking field service technicians, we will significantly improve efficiency. Additionally, we will transform our engagement with customers and contractors throughout the job lifecycle, fostering a seamless, collaborative, personalised, and engaging relationship. Furthermore, integrating the field service application with other core systems will enable data sharing and collaboration across functions, ensuring a cohesive and efficient operation. These changes will result in faster and more accurate scheduling, improved technician productivity, and reduced operational bottlenecks. Customers and contractors will experience a more transparent and interactive process, leading to higher satisfaction and trust. The integration of systems will provide a single source of truth for data, enabling better decision-making, stronger collaboration across teams, and ultimately delivering a more reliable and responsive service experience.
Cyber Security Uplift	2023/24 onwards	This program aims to secure Endeavour's technology and sensitive data, providing confidence to our employees, customers, and partners while positioning us at the forefront of the energy transition. It focuses on strengthening cyber and information security through advanced detection and response capabilities, continuous monitoring, and integration of best-practice standards. The program will enable rapid detection and response to sophisticated cyber incidents targeting critical business systems and sensitive information. It will reduce cyber and information security risks by monitoring security controls and minimizing the attack surface across people, processes, technology, and the supply chain. Additionally, we will achieve ISO 27001 certification and compliance with Security Profile (SP) 2 of the Australian Energy Sector Cyber Security Framework (AESCSF), ensuring robust governance and industry alignment.

ADMS Upgrade		The ADMS upgrade is a key initiative to maintain the reliability and performance of Endeavour's network management platform. It addresses end-of-life risks across software and hardware, enhances the system's ability to manage Distributed Energy Resources (DERs), and supports the transition to an integrated SCADA platform, enabling real-time monitoring, control, and automation essential for modern grid operations. The ADMS upgrade will modernise critical systems, address end-of-life risks and enable advanced functionality to support a more resilient, efficient, and future-ready network. It will enhance outage and switching management, grid optimisation, and real-time control, while significantly improving the ability to manage Distributed Energy Resources (DERs). This includes better planning, constraint management, and control. This is essential for responding to rapid load growth, regulatory shifts, and extreme weather. The upgrade also ensures continued vendor support, reducing operational risk and long-term maintenance costs.

Appendices

Appendix A: Glossary

Abbreviation/Phrase	Definition
AEMC	The Australian Energy Market Commission is the rule maker and developer for Australian energy markets
AER	Australian Energy Regulator
DAPR	Distribution Annual Planning Report prepared by a Distribution Network Service Provider under clause 5.13.2 of the National Electricity Rules
DNSP	A Distribution Network Service Provider who engages in the activity of owning, controlling, or operating a distribution system, such as Endeavour Energy, Ausgrid and Essential Energy
GJ gigajoule	One gigajoule = 1000 megajoules. A joule is the basic unit of energy used in the gas industry equal to the work done when a current of one ampere is passed through a resistance of one ohm for one second
GWh gigawatt hour	One GWh = 1000 megawatt hours or one million kilowatt hours
HV high voltage	Consists of 22kV, 12.7kV and 11 kV distribution assets (also referred to as medium voltage in some sections of this report)
HVC	High voltage customer
kV kilovolt	One kV = 1000 volts
kW kilowatt	One kW = 1000 watts
kWh kilowatt hour	The standard unit of energy which represents the consumption of electrical energy at the rate of one kilowatt for one hour
LV low voltage	Consists of 400V and 230 volt distribution assets
Major Event Day	Any day that exceeds a daily SAIDI threshold
MW megawatt	One MW = 1000 kW or one million watts
MWh megawatt hour	One MWh = 1000 kilowatt hours
NER	National Electricity Rules
Primary distribution feeder	Distribution line connecting a sub-transmission asset to either other distribution lines that are not sub-transmission lines, or to distribution assets that are not sub-transmission assets. An example is the first distribution feeder out of a zone substation
RIT-D	Regulatory Investment Test for Distribution
Sub-transmission	Any part of the electricity network which operates to deliver electricity from the transmission system to the distribution network and which may form part of the distribution network, including zone substations
Sub-transmission system	Consists of 132kV, 66 kV and 33 kV assets
V volt	A volt is the unit of potential or electrical pressure
W watt	A measurement of the power present when a current of one ampere flows under a potential of one volt

endeavourenergy.com.au

Endeavour Energy

POWER together