



Distribution and Transmission Annual Planning Report Summary

December 2024



Guide To This Document

We are the custodians of a network that connects communities and empowers the lives of our 1.8 million customers, and have done so for over a century. Ausgrid operates as both a transmission and a distribution network service provider. Our network is made up of approximately 30,000 substations connected through high and low voltage power lines, underground cables, tunnels and power poles. Our operations include infrastructure construction, maintenance and operation, customer connections, street lighting and telecommunications. We are increasingly involved in supporting the transition to a net zero economy through the connection of renewable energy to the grid, by the electrification of loads such as transport via electric vehicles and by supporting the NSW Government's Electricity Infrastructure Roadmap through the development of renewable energy zones.

The Distribution Annual Planning Report (DAPR) section of this document covers a five year forward planning period, while the Transmission Annual Planning Report (TAPR) section covers a ten year forward planning period, from December 2024. Our 2024 Distribution and Transmission Annual Planning Report (DTAPR) document is accessible via Ausgrid's website www.ausgrid.com.au/DTAPR, with the supporting data at our new online portal located at <https://dtapr.ausgrid.com.au>.

This data has been structured to enable you to easily target the key locations and come to us with solutions that more readily meet the needs of our customers and grid.

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Junayd Hollis
Group Executive -
Customer, Assets & Digital

Message from Junayd Hollis

Like many electricity networks around the globe, Ausgrid is redefining its role in the transition to a sustainable future. We have an obligation to protect the long-term interests of our customers and the communities we serve. The role we now play is more important than ever as we help balance the cost of living with Australia's decarbonisation ambitions. Our purpose is to make electricity accessible for all, and our vision is for our communities to have the power in a resilient, affordable and sustainable future.

This vision aligns with our customers priorities for more:

- Reliable electricity – so customers can live their lives with certainty that Ausgrid is there to power their needs;
- Affordable electricity – with customers having the power to choose when and how they use electricity to manage their bills; and
- Renewable electricity – to protect our planet now and into the future.

In 2024, customer energy resource (CER) adoption continued to increase, including rooftop solar systems, battery installations and electric vehicles uptake in our network area. CER gives customers options to generate, store and supply renewable energy back to the grid.

We have also seen a sharp increase in the activity associated with the connection of grid generation and storage projects including Ausgrid's own community battery investments. Community batteries can help customers without rooftop solar access to the benefits that CER provides, by storing excess generation and supplying it back when needed.

Electric vehicle (EV) adoption is also increasing, replacing fossil fuels with higher electricity demand. EV charging infrastructure is being deployed, giving customers access to purchase an EV where home charging is not an option.

Over the past year, in delivering to our purpose and vision, Ausgrid has:

- Been selected as the preferred network operator by the NSW Government to build, operate and maintain the Hunter Central Coast Renewable Energy Zone (HCC REZ) network infrastructure, to allow 1 GW of renewable generation to connect to the grid and supply clean energy to the community.
- Supported the approval to connect a 135MW Solar Farm to the Muswellbrook 132kV network. This will be the first renewable generation of this scale to be connected directly to our network.

- Developed tools to provide information about the hosting capacity of the network to our customers, to enable them to make better energy investment decisions.
- Commissioned three Stand Alone Power Systems (SAPS) in the Upper Hunter network, to improve reliability, resilience and reduce costs for customers. Next year, Ausgrid is continuing SAPS trials across the region with interested landowners.
- Continued our community battery program, with support from the Australian Renewable Energy Agency (ARENA), to transition from 250kW Battery Energy Storage Systems (BESS) to 4.99MW units co-located at local substations.
- Received the final decision for our regulatory proposal from the Australian Energy Regulator (AER) covering the 2024-29 period. This decision determines our revenue for the next five years to cover operating costs and investments to upgrade the network, maintain its reliability and improve accessibility.
- Obtained AER's acceptance of our first contingent project, which is a significant augmentation proposed in the Macquarie Park network. If trigger events are met, the project will be added to our regulatory determination.

Our 2024 Distribution and Transmission Annual Planning Report Summary

The Distribution and Transmission Annual Planning Report (DTAPR) has been divided into two documents: a summary, focusing on our strategies, accomplishments, and challenges; and the extended DTAPR document, which outlines our 2024 annual planning review and delineates our obligations as a Distribution and Transmission Network Service Provider in the National Electricity Market.

Looking at the forward planning period, we continue to explore opportunities in:

- Making it faster, easier and cheaper to connect to our network,
- Supporting the connection of additional renewables and storage,
- Enhancing network resilience
- Continuing to trial and implement innovative technologies on our network,

We will pursue these opportunities while continuing to focus on affordability in light of cost-of-living pressures. We see electrification as the pathway to resilient, affordable and sustainable future.

This report provides an overview of our plans and strategies for the forward planning period. If you have enquiries, please reach out to us at assetinvestment@ausgrid.com.au.

Junayd Hollis
Group Executive - Customer, Assets and Digital

About Ausgrid

Ausgrid is operated under a long-term lease via a partnership between the NSW Government and AustralianSuper, APG Asset Management and IFM Investors where 49.6% of interest and share are held by the NSW Government.

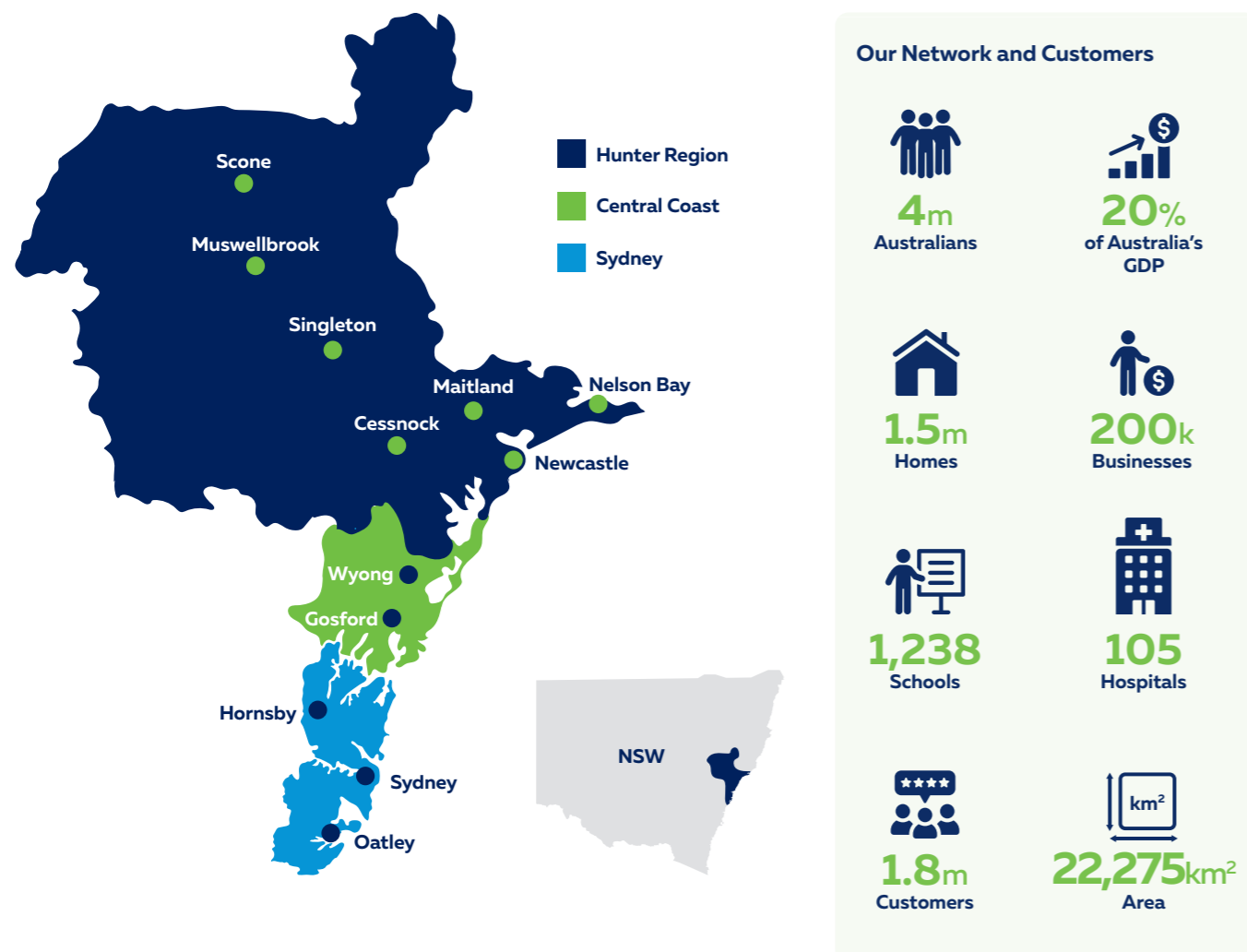
Ausgrid owns and operates the network of substations, powerlines, underground cables and power poles that deliver power to communities across large parts of Greater Sydney, the Central Coast and the Hunter. Ausgrid's network is a shared asset that empowers our customers and their communities today and has done for over a century.

Our core business is to provide distribution network services to our customers. Each day we build, operate and maintain the distribution network with a focus on providing a safe, reliable, affordable and sustainable energy supply. The wide range of services we provide is illustrated on the next page.

We're investing now for a future where renewables play a dominant role in the power mix and households and businesses can generate their own energy and sell it back to the grid. The grid has a pivotal role in supporting customers during this energy transformation. We are committed to working with our customers and stakeholders to realise this lower carbon future sooner and at the lowest possible cost for all customers.

Our Network and Customers

We provide an essential service to over four million customers including urban residents and businesses in Sydney, Australia's largest city, and those in rural areas across the Central Coast and Hunter Valley. Our customers also consist of councils, telecommunication providers and developers. We service critical infrastructure within our network footprint, including schools and hospitals.



Ausgrid network covers 22,275 km² made up of large and small substations connected through high and low voltage powerlines, underground cables, tunnels and power poles, including

Dual function subtransmission system 132kV transmission assets operated in parallel to and in support of the main transmission system	Subtransmission system 33kV, 66kV and 132kV assets	High voltage (HV) distribution system Predominantly 11kV, with some 5kV, 22kV and 33kV and 12.7kV Single Earth Wire Return assets	Low voltage (LV) distribution system 400V assets (230V single phase)
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Operating Environment

Ausgrid is regulated by statutory and legislative requirements, including Work Health and Safety (WH&S), environmental, competition, industrial, consumer protection and information laws, National Electricity Law (NEL), National Electricity Rules (NER) and the NSW Electricity Supply Act 1995 (ESA). We must also comply with the conditions of our NSW DNSP licence (under the ESA) and Security of Critical Infrastructure Act 2018.

The NEL and NER regulate the NEM, and the National Energy Customer Framework. Ausgrid operates in the NEM as both a DNSP and TNSP. The National Electricity Objective (NEO), was amended in late 2023 to include an emissions reduction component, and as stated in the NEL is to:

"Promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:

- (a) price, quality, safety, reliability and security of supply of electricity; and
- (b) the reliability, safety and security of the national electricity system; and
- (c) the achievement of targets set by a participating jurisdiction –
 - (i) for reducing Australia's greenhouse gas emissions; or
 - (ii) that are likely to contribute to reducing Australia's greenhouse gas emissions."

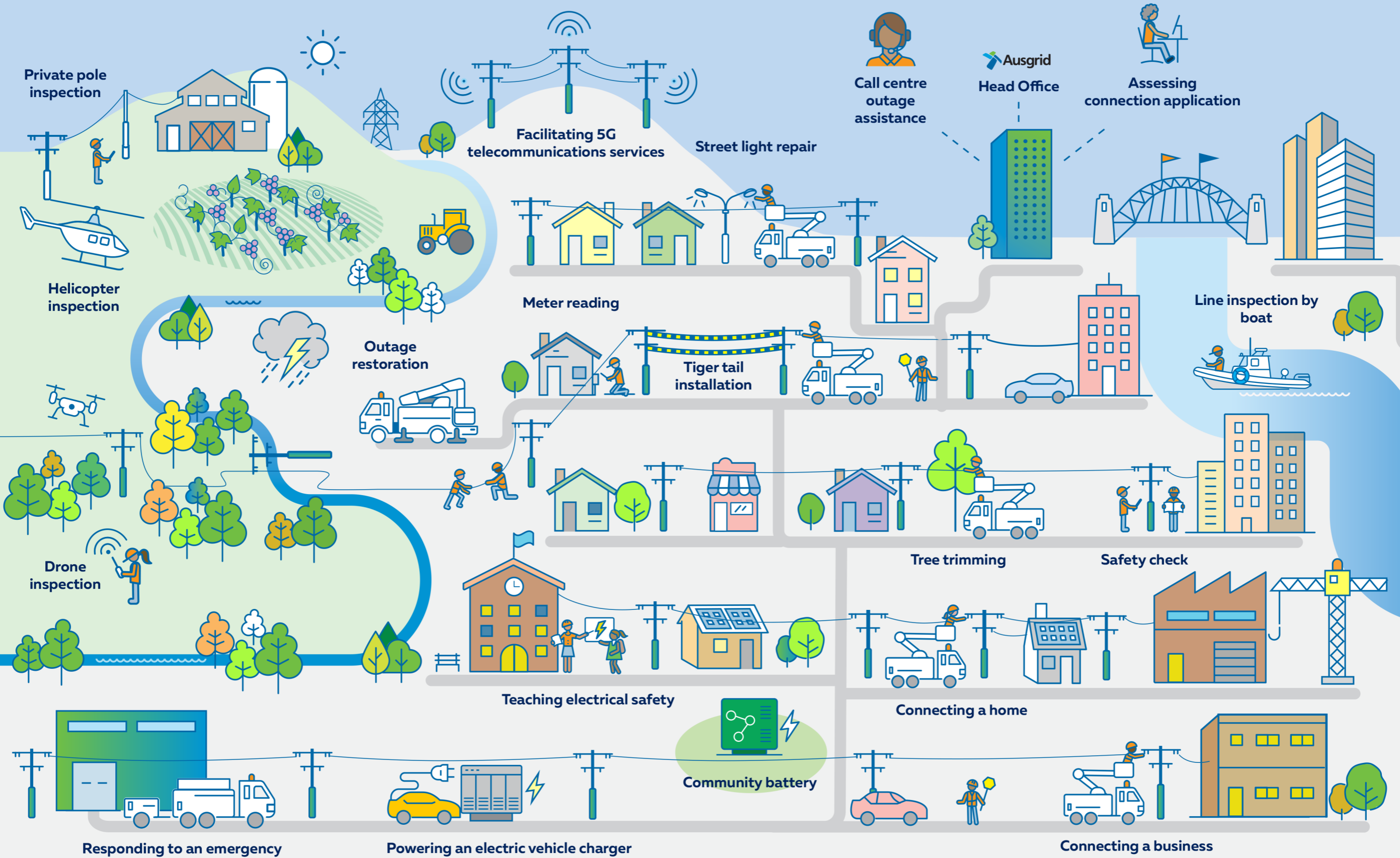
We meet these obligations with investments that address our customers' requirements for safe, affordable, reliable and sustainable network services.

We manage compliance with these laws and regulations through our internal codes and policies and a common control framework. This control framework comprises plans, policies, procedures, delegations, instruction and training, audit and risk management.

Our Purpose Making electricity accessible for all.	Our Vision For our communities to have the power in a resilient, affordable and sustainable future.	Our Values <ul style="list-style-type: none"> • Work safe, live safe • Customer-focused • Commercially minded • Collaborative • Honest and accountable • Respect
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Our Role in the Community

This diagram shows some of the wide range of services we provide to our community.





Purpose of the Distribution and Transmission Annual Planning Report

This DTAPR complies with National Electricity Rules (NER) clause 5.13.2 DAPR and clause 5.12.2 TAPR, utilising Version 214 of the NER. Ausgrid has prepared this DTAPR with a five-year forward planning horizon, reflecting the outcomes of the annual planning review of Ausgrid's electricity network since the December 2023 DTAPR publication.

The purpose of this document is to inform Registered Participants, stakeholder groups and interested parties of the identified future network needs, the committed and proposed solutions to these needs and the potential opportunities for non-network solutions, particularly for large investments where the Regulatory Investment Test for Distribution (RIT-D) applies.

Ausgrid's DTAPR aligns with the NER Schedule S5.8 DAPR to:

- Provide transparency to Ausgrid's decision making processes and assist non-network providers, other Network Service Providers and connection applicants to make efficient investment decisions;
- Promote efficient investment decisions in the electricity market;
- Include information on the planning process encompassing forecasting, identification of network limitations, and the development of potential credible options to address these limitations;
- Present the results of Ausgrid's annual planning review, including joint planning with other Network Service Providers, covering a minimum five year forward planning period for distribution assets;
- Offer third parties the opportunity to offer alternative proposals to the identified network needs, including non-network solutions such as demand management or embedded generation;
- Provide network capacity, load forecasts and hosting capacity for embedded generation for sub-transmission lines, zone substations and transmission-distribution connection points, and any 11kV primary distribution feeders which are constrained or are forecast to be constrained within the next two years; and
- Provide information on Ausgrid'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.

Distribution and Transmission Annual Planning Review and Reporting

Ausgrid owns, develops, operates and maintains transmission dual function assets in NSW that are operated in parallel with Transgrid's network, and perform a transmission function by supporting the main NSW transmission network. Ausgrid is therefore also registered as a TNSP and is required to publish a TAPR covering our dual function assets. The NER permit Ausgrid to publish its TAPR as part of the DAPR to align the publication of both reports each year.

Reporting of both planning reviews have been merged into one document.

Disclaimer

Ausgrid, registered as both a Distribution and Transmission Network Service Provider, provides this DTAPR 2024 under NER (clause 5.13.2 and 5.12.2) for the sole purpose of informing Registered Participants and Interested Parties about the annual planning review results for distribution and transmission networks.

This document may not contain all necessary information for prospective investors or participants. Ausgrid does not consider individual investment objectives, financial situations, or specific needs. Therefore, readers and users should independently verify the information for accuracy, completeness, reliability, and suitability.

Ausgrid makes no guarantees regarding the accuracy, reliability, completeness, or suitability of the information in this document. Readers and users acknowledge that Ausgrid, its employees, agents, and consultants assume no liability, except as required by applicable statutes.

Network Growth and Opportunities

Enabling Connections: Increasing Opportunities to Connect

Load Growth

The demand for load is changing as customers look to electrify. A key contributor to this change is the adoption of electric vehicles, replacing traditional fossil fuels with increased demand for electricity. The adoption of EVs and the roll-out of EV charging infrastructure must be met with available network capacity.

Additionally, the data centre market is experiencing significant growth, driven by the rise of hyperscale cloud services and the rapid development of artificial intelligence technologies. Ausgrid is uniquely positioned to support this growth, and is working closely with data centre developers to understand their emerging needs.

Ausgrid currently supports 52 dedicated data centres across its network area. These facilities range in scale from 5 MVA to nearly 200MVA, providing essential infrastructure to meet the rising demand for data storage and processing capabilities. As the digital economy grows, the need for reliable and scalable data centre facilities has become increasingly critical.

In 2024, Ausgrid has seen a surge in interest from new data centre operators. With over 50 new enquiries and applications, the prospective capacity from these developments totals more than 7000MW, reflecting the strong demand for data centre infrastructure, driven by the expansion of digital services and the growing importance of cloud computing.

Ausgrid is meeting this rapid market growth through a range of strategic initiatives aimed at ensuring an efficient integration of new customer capacity:

The Connections Excellence Program: This program is designed to deliver a faster, more efficient, and better value connections experience for data centre customers

Proactive Customer Engagement: Engaging directly with customers and industry stakeholders allows Ausgrid to understand market needs and tailor its services to build strong relationships and facilitate smoother project development

Strategic Network Planning: Ausgrid employs strategic, innovative, and holistic network planning practices to enhance the integration of new data centres into the current network, ensuring that the network remains robust and adaptable to future demands

Encouraging Industry Investment: To support sustainable growth, Ausgrid promotes investment in areas where distribution network capacity is readily available, or where there is potential for grid scale renewable energy developments

Investment in Infrastructure: To accommodate the increased load and ensure reliability, Ausgrid is investing in new distribution network assets and major substation developments

Hosting Capacity

The electricity industry is undergoing a significant transformation, with a shift towards an energy mix dominated by renewable energy resources. Solar generation, energy storage and other distribution energy resources are integrating into Ausgrid's network at a rapid pace. Additionally, customer loads such as electric vehicles and data centres have seen considerable growth in recent years.

One critical aspect of the network's preparedness for the energy transformation, is whether the network has the available capacity for connecting both new *loads* and *generation resources* without requiring substantial infrastructure investment, collectively referred to here as 'hosting capacity'.

However, the precise amount of additional load and generation the network can accommodate is often unclear. To address this, Ausgrid conducts hosting capacity analysis to determine the maximum amount of load and generation that can be connected to the network without compromising its performance or firm rating.

Hosting capacity analysis serves as a key process for understanding the limits of the network. Its primary objective is to calculate the maximum size of coincident load or generation that can be added to the network without impacting reliability, efficiency, or safety. The insights from these studies are essential for supporting new connections and maintaining network performance but also for guiding future investments.

Hosting capacity information is made available publicly, allowing to make better informed choices with regard to existing network capacity. By offering this level of transparency, Ausgrid helps its customers align their strategies with the network's current and future capabilities. We want customers to talk to us about potential future capacity and to hear from those who are considering connecting loads or generation resources on our network.

The hosting capacity information is a snapshot in time reflecting the network status at present based on the maximum load on the network. Ausgrid has recently began offering dynamic connections for customers that are flexible with their network usage and therefore could take advantage low load periods.

If you believe your needs are suitable for a dynamic connection, we encourage you to reach out to us at ausgrid.com.au. 'Getting Connected', as a good place to start for further information on how to get connected to the network.

For Application Form FAQs and supporting resources visit [Connection application support](#) or contact the Contestable Connections Team

Email: datanorth@ausgrid.com.au

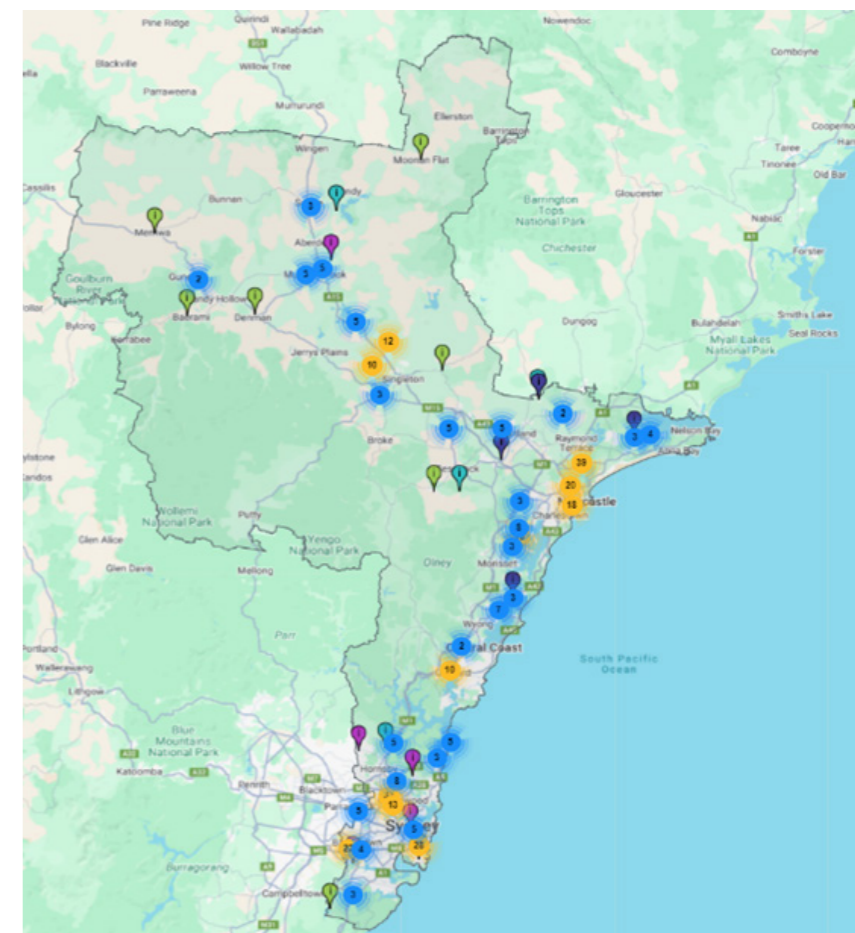
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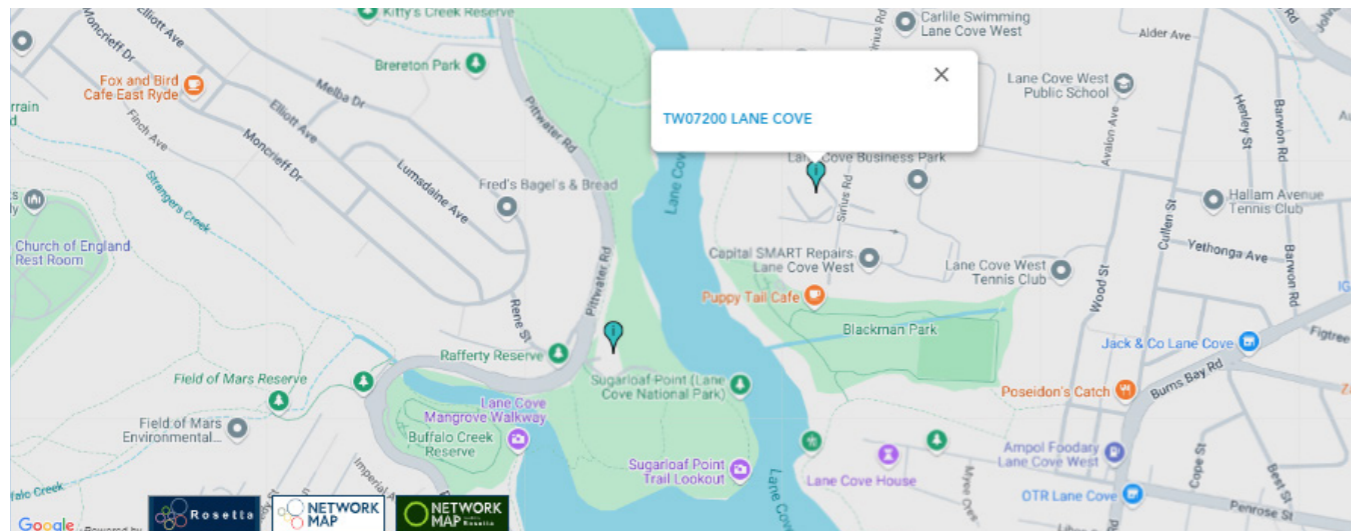
Hosting capacity data and analysis

To effectively manage the network and guide decision making, Ausgrid conducts hosting capacity assessments at two key levels, providing a detailed view of network capabilities:

- **Feeder-level analysis:** Ausgrid performs power flow simulations at sub-transmission feeder level, including contingency analysis, to evaluate the amount of additional capacity each feeder can support.
- **Substation-level analysis:** Simulations are conducted at both the primary and secondary voltage levels of substations to determine the available hosting capacity at these nodes. Substation-level analysis identifies the capacity at points where significant load or generation is likely to be connected.

Ausgrid publishes hosting capacity data on its website, ensuring that network proponents, developers, and other stakeholders can easily access this critical information. By making this data publicly available, Ausgrid empowers stakeholders to make informed decisions regarding their potential investments. This also streamlines the connection application process, allowing Ausgrid to process requests more efficiently and assess new connections in a timely manner.





Report Data for TW07200 LANE COVE

Hosting Capacity

Substation	Voltage	HC Type	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Lane Cove STSS	132.0	Load (MVA)	340.1	340.1	320.1	292.6	252.6	212.6	167.6	0.0	0.0	0.0
Lane Cove STSS	132.0	Generation (MW)	478.9	478.9	487.6	498.9	488.9	488.9	488.9	488.9	488.9	488.9

Note: The network experiences frequent changes due to various factors, including proposed load and generation commitments. These changes can significantly impact the available hosting capacity at a given location. The provided hosting capacities show what is available at a point in time (October 2024). Customer applications based on the available hosting capacity cannot be guaranteed or reserved. Customers must submit an application for connection to undergo detailed investigations into the available hosting capacity and potential physical constraints.

Overview of Ausgrid network as displayed in the mapping portal and hosting capacity map. To view hosting capacity information, please visit [Ausgrid - Rosetta Data Portal](#).

Optimising the network for growth and sustainability

Hosting capacity analysis involves planning for future growth and enhancing network resilience and sustainability. Ausgrid updates the hosting capacity information annually and is working on processes to do it more frequently. By continuously evaluating the network's capacity to host additional loads and generators, Ausgrid is positioned to:

- **Optimise network use:** Through detailed assessments, Ausgrid can maximise the use of existing infrastructure, deferring costly network upgrades.
- **Support dynamic connections and flexible capacity:** Hosting capacity analysis allows Ausgrid to explore dynamic connections, where full capacity may not be available during certain times and under specific conditions. This flexible approach ensures that the network infrastructure is efficiently utilised, and customers have options to connect their projects even when 100% firm capacity may be limited.
- **Develop long-term planning:** In addition to current capacity assessments, Ausgrid forecasts hosting capacity for future years. This approach allows for better planning and decision making regarding future investments.
- **Deliver strategic investments:** Combined with an understanding of our customers future needs, hosting capacity analysis helps pinpoint potential constraints or bottlenecks that could limit future growth. By identifying these areas early, Ausgrid can prioritise interventions to unlock additional capacity, ensuring that network remains flexible and capable of supporting future energy demands.

Dynamic nature

It is important to recognise that hosting capacity is not static, it is subject to change based on conditions and ongoing developments across the network. Hosting capacity analysis is conducted based on the best available data and network models as of October every year. Factors such as new load applications, generation proposals, and network commitments can alter the available hosting capacity.

For this reason, the hosting capacity published by Ausgrid should be viewed as indicative only, reflecting the network's status at the time the most recent snapshot was taken.

By leveraging hosting capacity analysis, Ausgrid aims to enhance the network's ability to support a growing number of loads and generations, ultimately contributing to a more sustainable and resilient network.

EV Uptake

EV forecasts in Ausgrid's network area

- EVs in NSW are expected to increase from approximately 66,000 vehicles in 2024 to over 1 million vehicles by 2030 (based on Australian Energy Market Operator's (AEMO) Step Change scenario). Around half of these vehicles will be using Ausgrid's network.
- All scenarios assume cost parity (i.e., the full cost of owning and operating a vehicle, without subsidies) between EVs and internal combustion engine (ICE) vehicles should happen before 2030.



Increasing EV charging infrastructure uptake in Ausgrid's network

Ausgrid is leading the industry by providing 'facilities access' agreements to enable charge point operators to lease out space on our assets to deploy their chargers on our kiosks and poles.

With support from the NSW Government, Ausgrid will be connecting 100s more EV chargers in our network. However, this will fall far short of the NSW Government's projected need for 26,000 to 30,000 public AC charging points in NSW.

This is why Ausgrid has been advocating to be able to build, own and maintain (but not sell energy through) 11,000 pole mounted AC chargers on our network. We want to support approximately 30% of NSW residents who do not have access to powered off-street parking.

Ausgrid proposes to maintain these chargers to the same high reliability standards as the rest of our network assets, while providing all charging providers open access to these chargers via a standard electricity tariff. This will expand existing charging providers' networks. This way customers will be able to access AC kerbside charging for similar costs to those able to charge at home.



Leveraging Impact of Renewables and Storage

Renewable Generation

The Energy Corporation of NSW (EnergyCo) is a NSW Government statutory authority responsible for delivering and coordinating investment in Renewable Energy Zones (REZ) as part of the State's Electricity Infrastructure Roadmap.

Renewable Energy Zones combine new wind and solar power generation into locations where it can be efficiently stored and transmitted across NSW. Five zones have so far been identified which will deliver a reliable electricity supply to meet the growing demand of power from our regions and cities, one of which is in the Hunter Central Coast area.

In December 2024, EnergyCo announced that they will be working with Ausgrid to deliver the proposed network solution for the HCC REZ. This involves upgrading the existing electricity network to allow new renewable generation to connect to the grid. These enhancements are vital to meeting both our current and future energy needs.

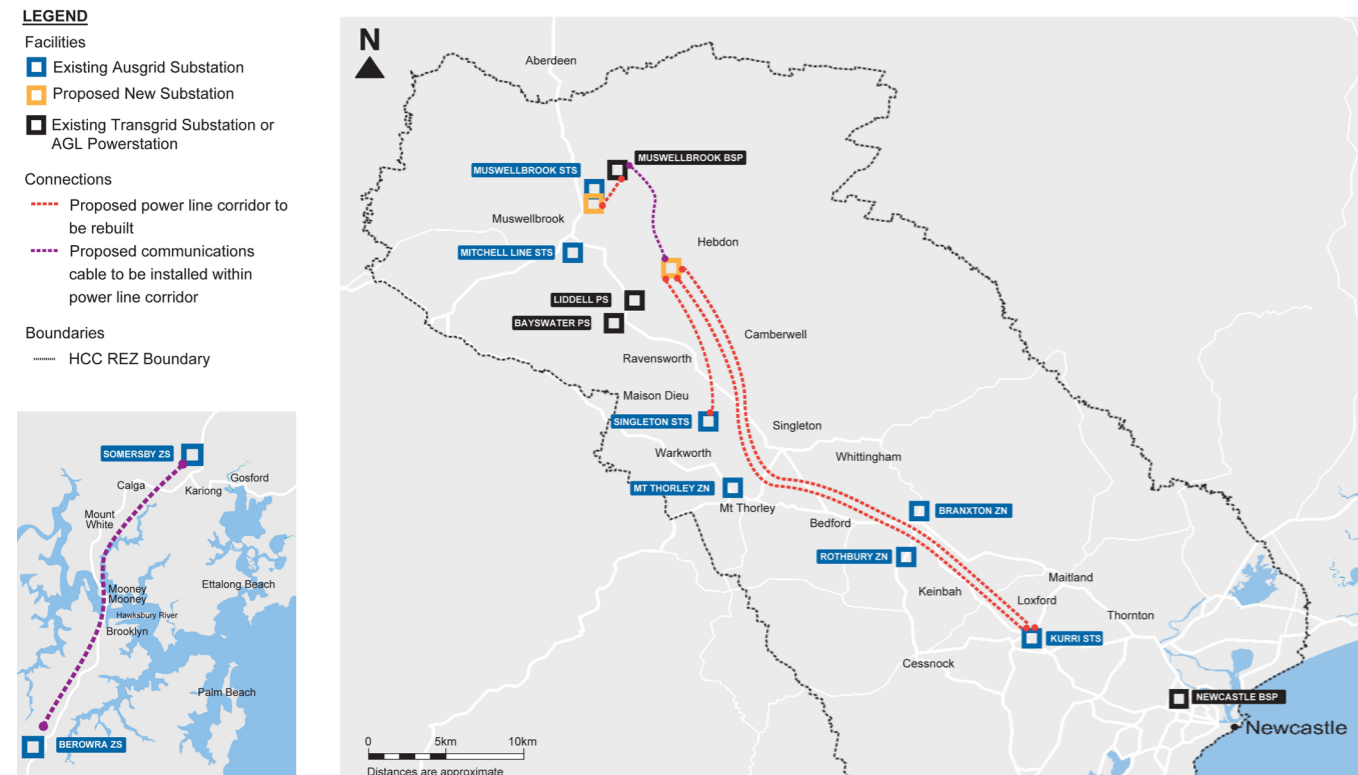
The proposed solution will primarily involve upgrades to existing network infrastructure, and re-use of existing corridors. This minimises impacts on surrounding communities and the environment, while delivering the capacity to transfer at least 1 gigawatt of renewable energy.

This will bring significant economic benefits to the region including more jobs, opportunities for local businesses and potential new industries.

The map below shows the areas where Ausgrid's proposed upgrades will occur.

Ausgrid is committed to working alongside EnergyCo and engaging with local councils, landowners, communities, and businesses to ensure the project delivers benefits for all stakeholders.

Proposals have also been submitted to EnergyCo to participate in the 2025 IOR (Infrastructure Investment Objectives Report) report. The proposals will be evaluated and shortlisted for EnergyCo to make a final determination on which options it would progress with by July 2025.



Ausgrid is continuing work with the NSW government, to identify further opportunities to support large renewable generation in our network. This ongoing work is vital to securing the long-term interest of our customers by providing sustainable and secure sources of generation.

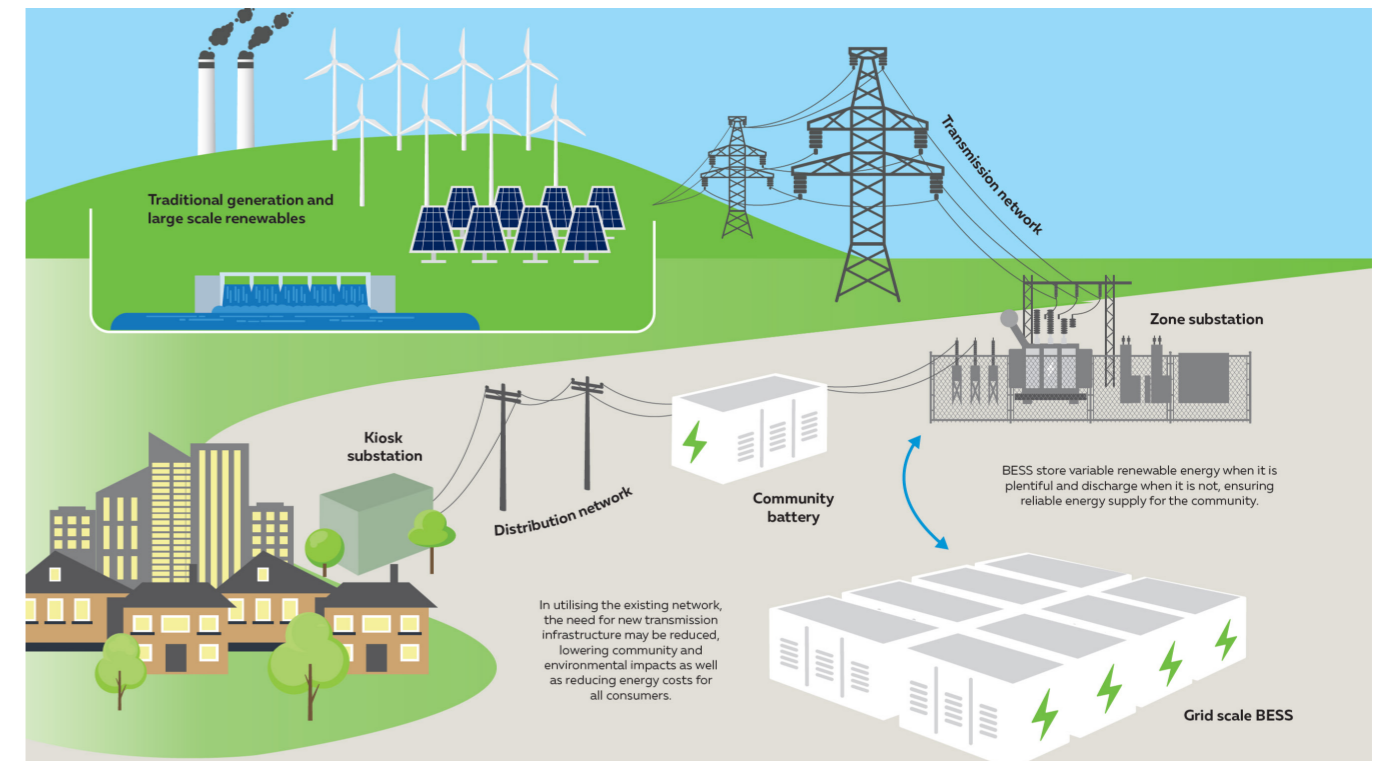
BESS

Ausgrid Group is building a resilient and sustainable energy system by expanding energy storage on the distribution network, increasing the integration of renewable energy and ultimately paving the way for a more sustainable future. Ausgrid Group's ambition is to deliver up to 1.5GW of distribution connected storage to the energy market by 2031.

By better leveraging existing network assets, Ausgrid Group is developing a portfolio of cost-effective BESS to improve network resilience by storing and securing excess generation, allowing access to power during peak periods of demand.

This approach ensures the best outcomes for our customers, the network and our shareholders, and helps deliver a faster, more affordable, and less disruptive transition.

As one of the first DNSPs to connect grid-scale storage to the distribution network, Ausgrid is leading the way in fostering a resilient and equitable energy transition. This initiative challenges the status quo and supports the ongoing integration and adoption of renewable energy, contributing to a sustainable energy future for all.



Community Batteries

Batteries are key to supporting the growth of renewable energy sources. A community battery is a shared solution for a local neighbourhood that allows both that neighbourhood and the wider community to access the multiple benefits batteries can provide.

Community batteries use existing Ausgrid infrastructure to capture and store excess energy produced locally (e.g. rooftop solar) and then releases that energy back to eligible consumers during peak demand times. By enabling more local energy use closer to the end consumer and utilising existing Ausgrid infrastructure, we can enable a faster rollout of energy storage at lower system cost, facilitating the energy transition and enabling more savings for customers.

Key Updates for 2024

- A total of 19 community batteries have been deployed totalling ~2MW / ~4MWh, including nine poletop batteries and 10 ground mounted batteries.
- Ausgrid has been awarded an ARENA grant of \$12.6M to deliver an additional 16 batteries totalling 40MW / 85MWh.
- Energy-Storage-as-a-Service (ESaaS) has been launched in partnership with two major retailers, enabling an estimated \$200 a year in energy bill savings for consumers. More retailers are expected to offer ESaaS in 2025.

The various benefits of community batteries are outlined below:

- Provides residential customers access to stored renewable energy and bill savings.
- Allows customers to access centralised storage without the upfront costs.
- Enables more rooftop solar and electric devices such as electric vehicle chargers to be connected without expensive network upgrades.
- Strengthens the grid and reduces the need to limit (curtail) solar exports. This helps customers maximise their solar investment.
- Helps explore new models that share more electricity produced from solar panels within the local area, including to households without solar panels.
- Creates a positive impact on wholesale electricity prices that can flow through to reduced retail electricity prices
- Helps to regulate voltage on the network and improves network quality in the local area.
- Reduces reliance on traditional poles and wires investment and helps lower network costs.



ESaaS overview

The crucial innovation that has enabled consumers to share in the benefits of community batteries is Ausgrid's ESaaS offering.

ESaaS enables eligible customers that live near a community battery to access the benefits of a shared community battery without any upfront cost, saving an estimated \$200 per year in energy bills. This approach not only delivers cost savings for consumers, but also improves grid reliability and facilitates greater integration of renewable energy.

Ausgrid partners with energy retailers to offer ESaaS, with two major retailers having launched their products to market. More retailers are expected to offer ESaaS in 2025.



SAPS and Microgrids

Ausgrid is investing in SAPS and microgrids to reduce outage impacts for certain customers in remote locations as well as reducing risk of fires in bushfire prone areas. SAPS are off grid electricity systems, generally comprised of solar photovoltaic arrays, energy storage and backup diesel generators.

SAPS and microgrids reduce bushfire risk as electricity infrastructure, that could potentially spark igniting a bushfire, is either no longer energised or removed. It is expected that the average cost to supply customers will fall if DNSPs provide SAPS on a permanent basis, leading to a reduction in network charges for the entire customer base. They can also

be used by electricity networks as practical solutions to make communities more resilient to extreme weather events and natural disasters as they enable a customer or community to isolate and remain energised in an emergency. This is particularly important for keeping telecommunication towers and fire-fighting equipment (water pumps) operational.

As distribution network's experience more natural disasters such as bushfires, storm events and floods, SAPS can also be utilised in an emergency to replace assets, allowing utilities to effectively provide the updated power solutions for our customers rather than replacing assets like for like. SAPS range in sizes but typically comprise a 13kW PV system, paired with a 7.5kW BESS & 9kVA backup generator connected to a single customer point of connection.

- 3 x SAPS have been commissioned to date in Mirannie with a further 7 under construction in Ellerston and Mirannie located in the Upper Hunter region of Ausgrid.
- A microgrid may be completely disconnected from the electricity network or it can be connected to the main electricity network with the ability to deenergise the main line for network maintenance or an impending extreme weather event.
- Ausgrid announced the construction of a LV Microgrid in Merriwa in late 2022. Ausgrid's depot in Merriwa was the ideal spot to locate the microgrid given its location on the main street and connected to the same low voltage network as many key small businesses.
- The Merriwa microgrid will supply the petrol station, supermarket, chemist, bakery, CWA hall, IGA supermarket and RSL amongst other small businesses that will be able to continue to service the township during planned and unplanned outages on the local electricity grid.
- Ausgrid has recently completed major construction activities with the installation of a new 500kVA diesel generator, 500kW/1000kWh BESS and 110kW solar installation along with microgrid control system.
- Final commissioning of the microgrid should be completed by early 2025.



CER Uptake

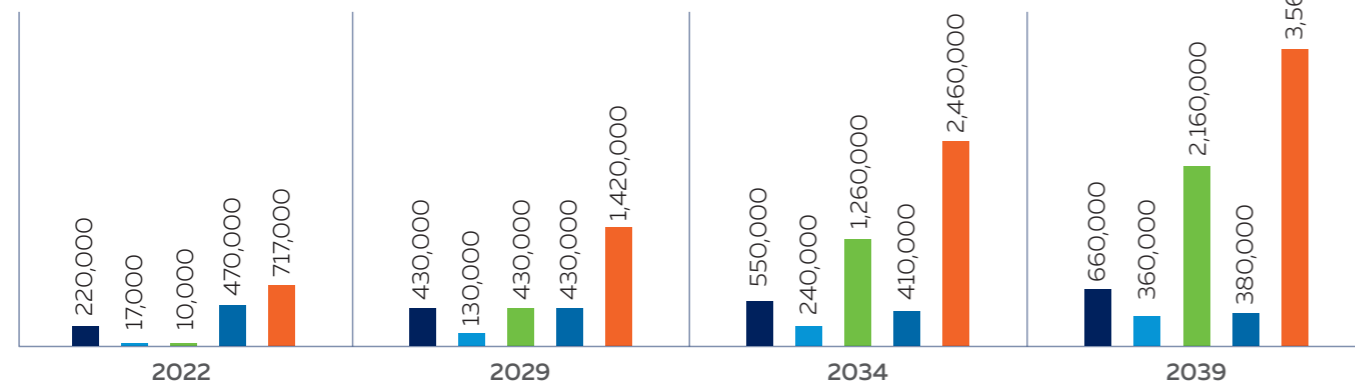
Ausgrid is adapting to a rapidly changing energy landscape including an acceleration of CER, which include behind-the-meter (BTM) renewable energy generation, storage, and EVs. The uptake of rooftop solar on our network has consistently exceeded forecasts, with this trend expected to continue. BTM storage, typically paired with rooftop solar, is forecast to grow from 17,000 in 2022 to 130,000 in 2029. EV adoption on our network is also accelerating, with numbers expected to rise from 10,000 in 2022 to 430,000 by 2029.

Updated forecasts

Ausgrid has updated its forecasts since the 2023 DTAPR for rooftop solar and BTM storage based on the latest inputs and assumptions from the AEMO¹. The forecast for EVs has also been revised upwards, reflecting recent adoption trends, updated technology pricing, emissions reduction policies, and power pricing forecasts. These updates indicate a significant increase in the number of rooftop solar systems and EVs, while the forecast for BTM batteries has decreased slightly. Overall, the forecast number of CER assets by 2034 has increased to 2.46m (as compared to previous forecast of 2.35m).

CER Adoption

- Rooftop solar system
- Behind-the-meter batteries
- Electric vehicles
- Flexible customer load (e.g. swimming pool pumps and electric hot water systems)
- Total CER assets



What this means for Ausgrid and our customers

Under certain conditions, high levels of CER can push the network beyond its design limits, leading to supply interruptions and curtailment. Successful integration of CER into the network is essential for maximising the value of customers' investments in CER and distributing these benefits across all connected customers.

Due to increasing two-way power flows, Ausgrid must support the integration of CER through efficient investment. Rooftop solar exports can cause network voltages to rise, leading to curtailment where inverters limit their output or trip off. This affects both in-home consumption and exports, with 11% of rooftop solar customers expected to experience some level of curtailment by 2029².

EVs increase maximum demand, particularly during times of peak household energy usage. While smart chargers will help to manage this, the majority of residential EVs currently use convenience charging, which typically occurs during peak times. This drives the need for network upgrades to manage capacity constraints and avoid equipment failures.






Managing network challenges and maximising CER integration

Ausgrid's approach to CER integration includes a range of initiatives to effectively integrate CER, manage the risks and opportunities of the accelerated adoption of CER. Our business strategy prioritises incentives to reduce the need for network augmentation and offers a wide range of network solutions to manage voltage non-compliance and capacity constraints due to increasing CER.

1. AEMO, 2023 - 24 inputs, assumptions and scenarios report, 2023, <https://aemo.com.au/en/energy-systems/major-publications/integrated-system-plan-isp/2024-integrated-system-plan-isp/current-inputs-assumptions-and-scenarios>

2. Ausgrid, 2023, Att. 5.7: CER Integration Program, <https://www.aer.gov.au/system/files/Ausgrid%20-%20Att.%205.7%20-%20CER%20integration%20program%20-%202031%20Jan%202023%20-%20Public.pdf>

Key initiatives include:

-  **Innovative Pricing Options**
Simplify tariffs and offer cost-reflective pricing to manage peak demand and reduce costs
-  **Coordination and Collaboration**
Enhance planning data transparency and improve network visibility through increased measurement and data sources
-  **Improved Network Visibility and Voltage Management**
Invest in dynamic voltage management tools and processes to maintain network stability.
-  **Transition from Load Control to Flexibility**
Develop incentives for flexible load and generation, adapting to smart meter adoption
-  **Investment in Grid Enhancement**
Address voltage and thermal constraints to support increasing rooftop solar and EV adoption.

The AER assessed Ausgrid's 2024-29 period regulatory proposal and determined that the requested funding for dealing with EV constraints was not required. Despite this, Ausgrid will continue to assess the needs of our customers and seek efficient methods to maintain reliable power supply, including monitoring and adjustment of our plans as CER uptake and usage patterns evolve.

Reducing Cost of Living Pressures

Addressing Affordability Challenges in the Energy Transition

Affordability continues to be a challenge during the energy transition, largely due to factors beyond our control, such as:

- Rising costs driven by inflation and increasing interest rates.
- The potential impact of additional investments in transmission and generation costs on energy bills.
- The need to balance achieving net-zero targets with maintaining affordable electricity for all customers.
- The impact on customers that do not have access to rooftop solar, home batteries and EV charging at home.

To maintain downward pressure on prices, Ausgrid will focus on:

- Making adoption of EV possible for more customers, through the availability of EV public charging.
- Making the benefits of CER available to other customers, through the use of community batteries and energy as a service.
- Offering dynamic connections, tariffs and coordinated management of CER, to improve the utilisation of existing infrastructure and reduce the need for network investments.
- Providing greater transparency of available capacity to encourage customers that have the option of where to connect, to locations where capacity is available, reducing the need for greater network investment.

The total revenue approved by the AER in its final decision is expected to result in an average increase of \$14 per annum (\$ nominal) to the average electricity bill for Ausgrid residential customers over the 2024-29 period. For small business customers, the impact would be an increase on average of \$38 per annum (\$ nominal). Ausgrid is addressing affordability challenges in the energy transition through some of the following initiatives:

- Amplify Value**
 - Investing in new grid capacity where it provides the highest net benefit for customers.
 - Dynamically managing our grid to unlock the most value out of what has already been build.
- Powering Progress**
 - Improve asset management and resilience strategies.
 - Drive technology advancements and operational efficiency.
- Stakeholder Synergy**
 - Foster stakeholder engagement so we understand their priorities and focus on high-value, aligned opportunities.

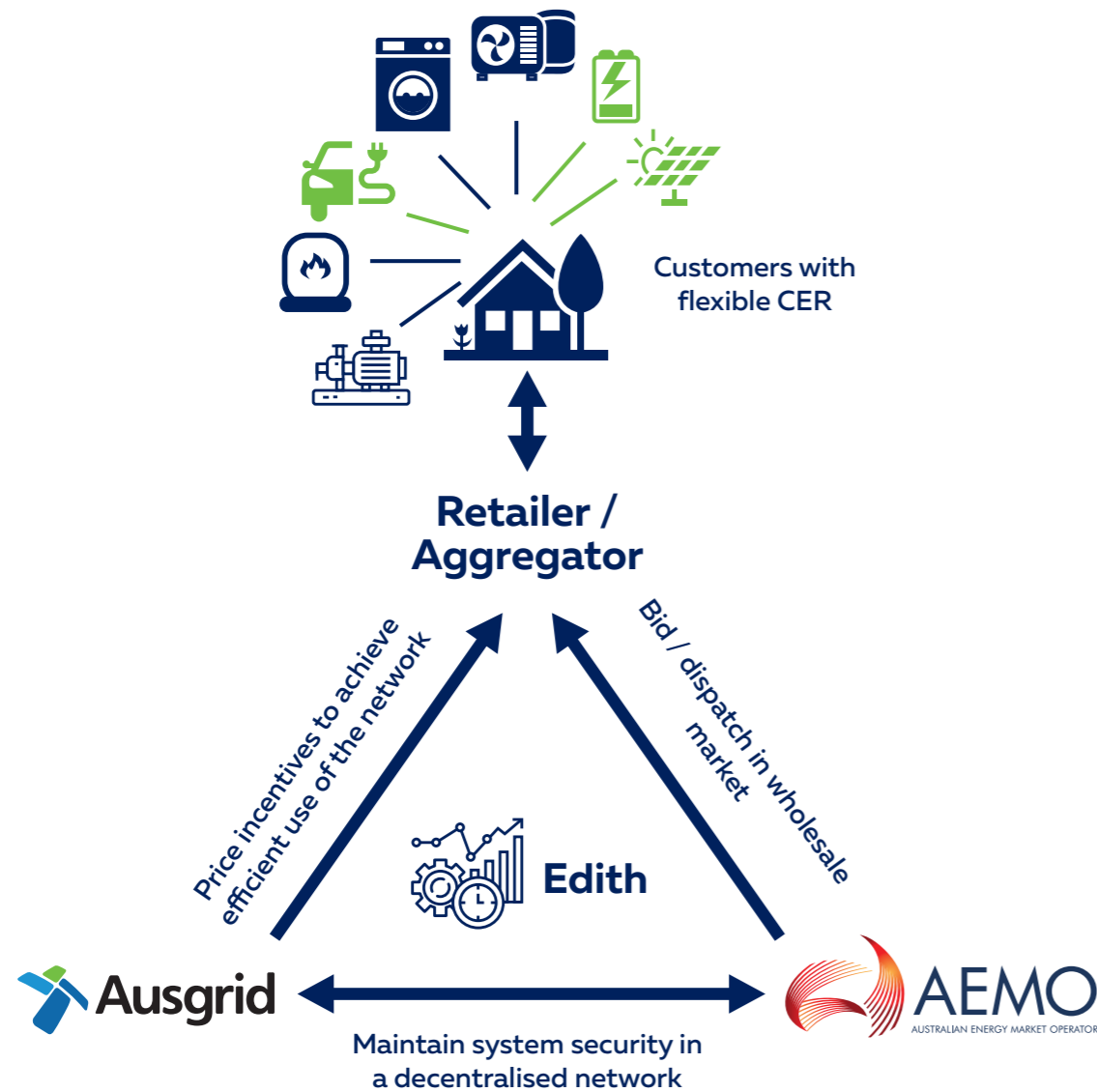
Participation of Customers in Energy Markets

As part of Ausgrid's commitment to innovation, we are developing tariffs that encourage customer participation in energy markets. Traditional network tariffs often create barriers, so Ausgrid aims to support the shift to a two-sided market by introducing more flexible solutions that benefit customers and the network.

Project Edith has successfully demonstrated the dynamic network pricing concept and is now expanding to include over 1,000 participating customers.

The project aims to explore the following:

- Implementing dynamic pricing options for customers with flexible Customer Energy Resources (CER) managed by retailers or aggregators, encouraging load shifting and providing network support during constraints.
- Supporting CER in participating actively in energy markets.
- Adopting a decentralised approach to managing network capacity at a local level.
- Utilising network assets and CER to manage voltage across the network dynamically.
- Providing customised connection agreements for customers who demonstrate significant flexibility in their network usage, rewarding efficient performance.



Enhancing Network Resilience

Ausgrid's Climate Resilience Program seeks to build resilience that maintains service levels in the face of climate change.

Ausgrid's climate change modelling indicates that our risk from climate related events will grow on average by 1 percent each year. Already, 62 percent of supply outages to customers are caused by climate related weather events.

Ausgrid's approach to build resilience includes a spectrum of resilience solutions that range from investments in the network, improving how we respond during outages, and community-based solutions to help communities be more resilient (see figure below).

Ausgrid also continues to be a proactive participant in the development of the NSW Reconstruction Authority Disaster Adaptation Plans, including assessment of distributor/telco co-dependencies. We are encouraged that the Australian Energy Regulator has recently published a value for network resilience and will continue to advocate for an evolving regulatory landscape to provide more equitable services for customers.

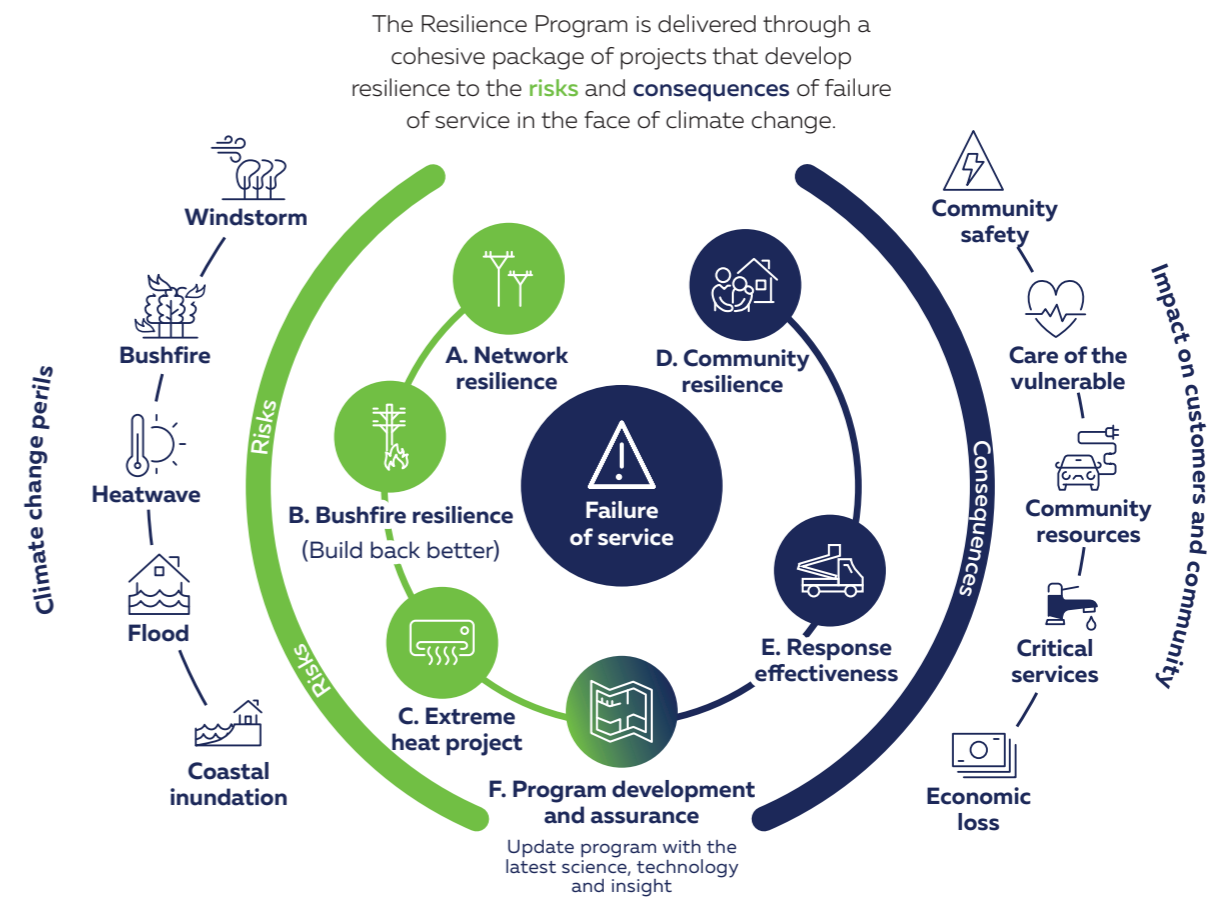
During the FY25-29 period Ausgrid will invest \$52M in network resilience and \$6M in non-network solutions including:

Replacement of over 100 km of bare HV conductors with Covered Conductors to mitigate faults caused by vegetation, install an additional 40 Reclosers to prevent outages for customers upstream of a fault, and small sections of HV undergrounding to mitigate windstorm impacts on poor performing HV power lines

Improving resilience of 3000 poles using fire resistant wraps.

Installation of over 600 line fault indicators that will assist the effective deployment of crews during major storms and large incidents.

A suite of customer prioritised initiatives to help withstand the impacts of prolonged outages. A local liaison function will work within vulnerable areas to support blackout planning, targeted communications and education for priority cohorts (e.g. life support customers)





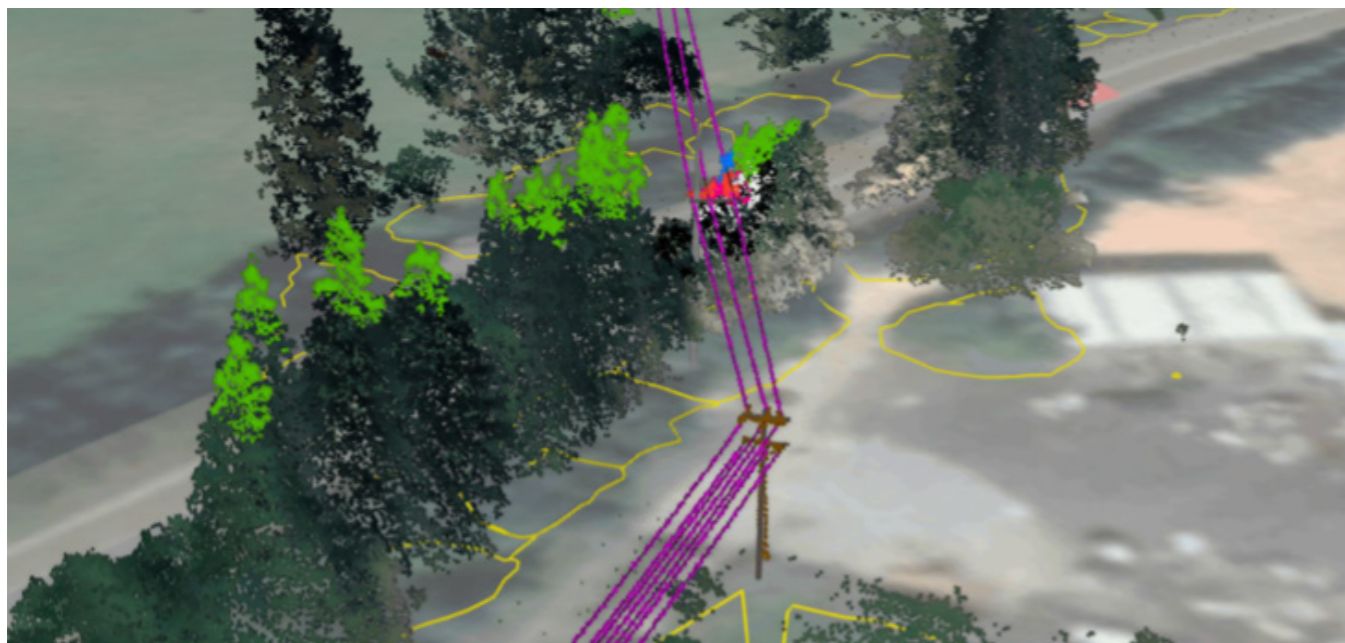
Advancement through Innovation

Network Digitisation

Ausgrid's longstanding commitment to innovation continues in 2024. There is an ongoing focus on delivering our digital twin, deploying advanced network technology, drones, as well as new big data platforms supported by artificial intelligence and machine learning to analyse and gain insights on how the network is performing for our customers.

Ausgrid's Network Digitisation Program harnesses spatial, physical and electrical information to improve reliability and affordability for our customers. Key components include:

- Streamlining mass data acquisition of our assets and their environment to develop mutually beneficial outcomes for our customers and other stakeholders. This includes capture of imagery, video and 3D spatial models using Light Detection and Ranging (LiDAR) technology.
- Operating a fleet of advanced drones to deliver asset inspections, data capture and operational support, to improve customer reliability and safety particularly through management of bushfire risk in remote areas.
- Deploying our latest digital twin model to deliver analytic insights using artificial intelligence and machine learning to reduce cost and risk across a multitude of use cases, reducing the need for site inspections and identifying potential asset failures or outages.

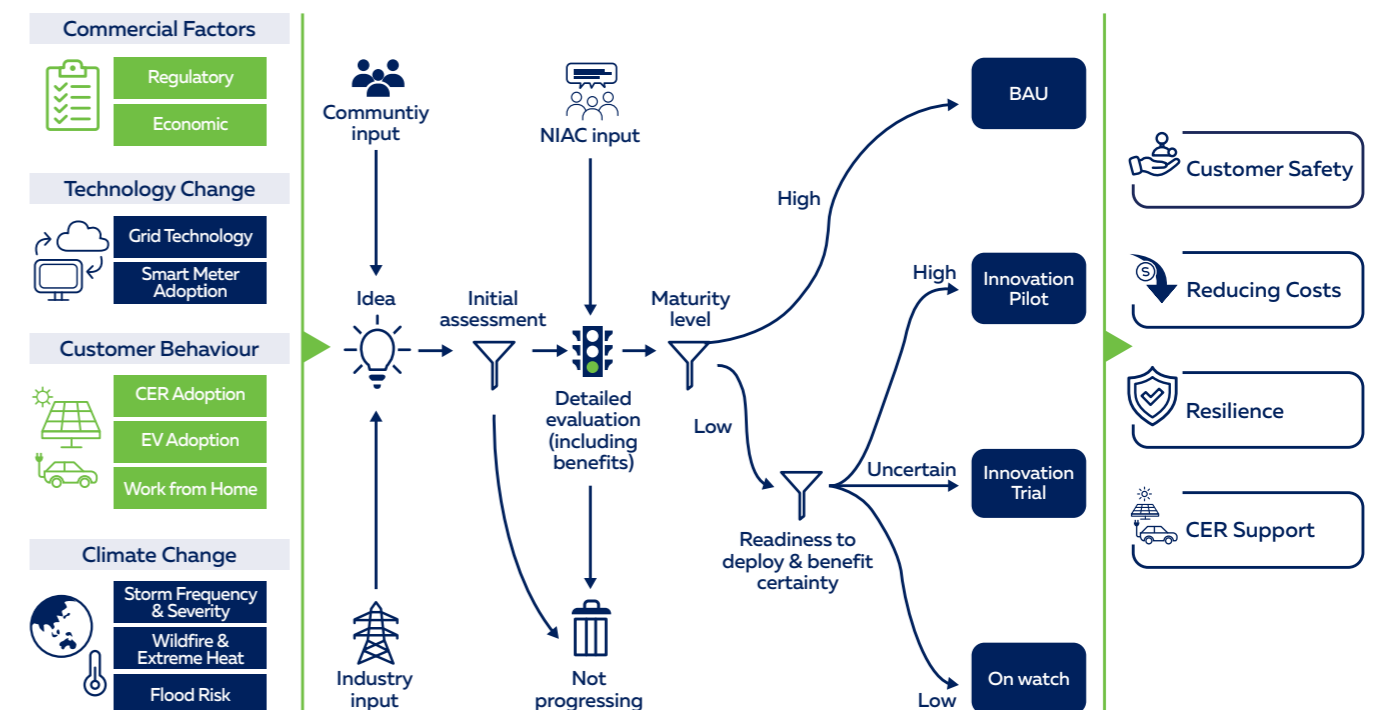


Innovation

Ausgrid's Network Innovation Program is a suite of research, trials and pilots covering leading edge technologies aimed at better meeting the needs and expectations of our customers in the context of the rapidly evolving electricity sector. The purpose of the program is to test advanced and emerging technologies to efficiently demonstrate the potential of these technologies to deliver significant benefits to our customers and the wider energy market if deployed at scale.

- Projects are grouped into thematic workstreams largely grouped in the following areas e.g. Advanced Voltage Regulation, Network Insights, Fringe of Grid Optimisation, Microgrid Trial, Asset Condition Monitoring, Line Fault Indicators, Dynamic Load Control.
- Advanced Voltage Regulation (AVR): 5 x AVR schemes commissioned at various zone substations and data collection commenced, 2 x under frequency load shedding (UFLS) blocking schemes commissioned, 3 x Pole Mounted Batteries completed in FY24.
- Network Insights: Distribution Monitoring & Control refurbishments completed with 101 kiosks & 10 chamber substations retrofitted to date, 740 Pole Top monitors installed on LV network.
- Fringe of Grid Optimisation: 3 x SAPS, commissioned with a further 7 under construction.
- LV Microgrid Trial: Microgrid at Merriwa township in Upper Hunter currently under construction.
- Dynamic Load Control: Published revised Customer Supply Standard ES7 Network Price Guide permitting Solar Soak controlled load tariff. Trials underway with participating retailers post July 2024 changes.
- Asset Condition Monitoring: Smart meter data volumes continue to increase enabling analytics platforms to proactively identify "Loss of Neutral" safety events.
- Line Fault Indicators (LFI): 7 smart LFI devices now in service with successful connection to Advanced Distribution Management System (ADMS).

Triggers of Change



Network Demand and Limitations

Identified System Limitations

This section is now part of our web-based portal located at <https://dtapr.ausgrid.com.au>, and should be viewed in conjunction with the rating and demand forecast data files which are available for download from Ausgrid's website at www.ausgrid.com.au/DTAPR, and as outlined in Appendix B of the main DTAPR.

Dual Function Assets

The list of Ausgrid's dual function assets is reviewed periodically and is used as input for preparing Ausgrid's regulatory reporting, regulatory submission and pricing methodology. For the purpose of the regulatory submission, the list of dual function assets is determined based on the forecast load and system configuration as at the beginning of the regulatory period.

Changes in dual function asset status There have been no changes in dual function asset status since the publication of the December 2023 DTAPR.

Dual function connection points The NER requires a TNSP to set out planning proposals for dual function connection points. Ausgrid's joint planning with customers, Transgrid and other NSPs may involve the establishment of new connection points. These augmentations are driven by constraints on the distribution network. However, when the augmentation options are considered in the future, the preferred solution may comprise a mix of dual function and distribution network augmentations.

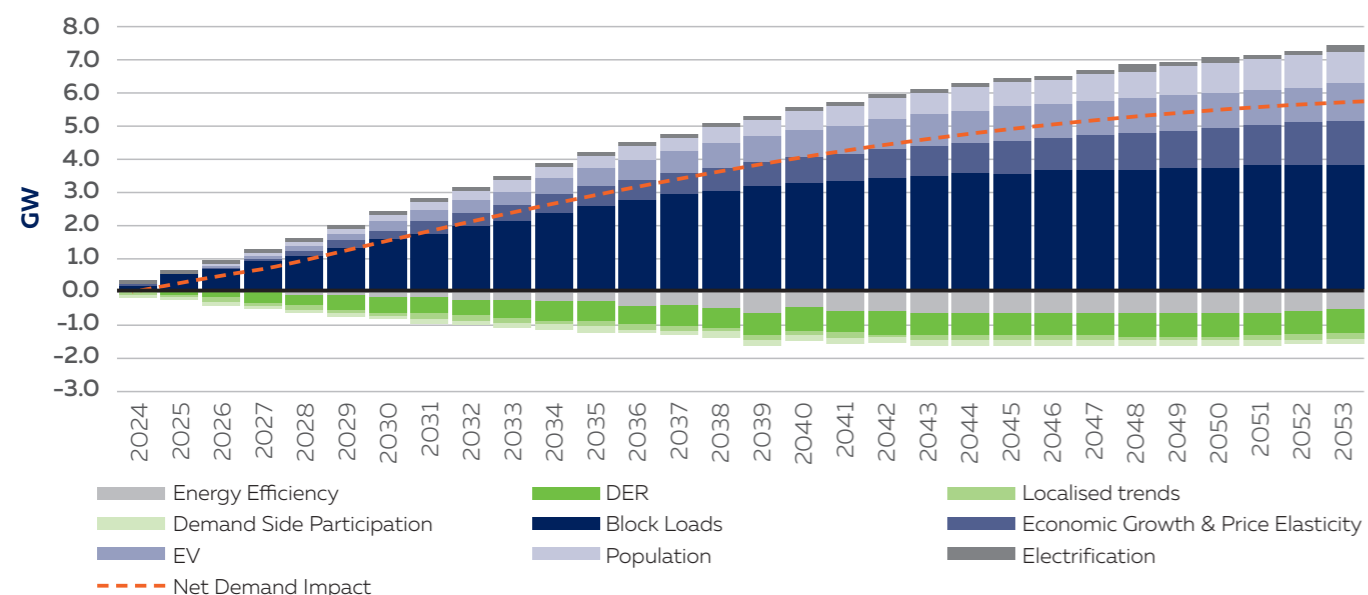
Completed new dual function connection points There have been no new dual function connection points completed in the last year.

Proposed augmentation of existing dual function connection points Ausgrid has identified the need to establish a new 132/33kV subtransmission substation in the Macquarie area due to load growth. Refer to Section 2.1 of the main DTAPR. The project to install a third 132/33kV transformer at Macquarie 132/33kV STS due to load growth became committed in 2024.

Committed new dual function connection point There are no committed projects for new dual function connection points since the publication of the December 2023 DTAPR.

Ausgrid System Total Maximum Demand Forecasts

The forecast system total summer maximum demand components are shown below. This chart displays the contribution of each forecast element in each year out of 2053 based on the 50% Probability of Exceedance (PoE) forecast maximum demand Step Change scenario from 2023/24 in megawatts (MW).



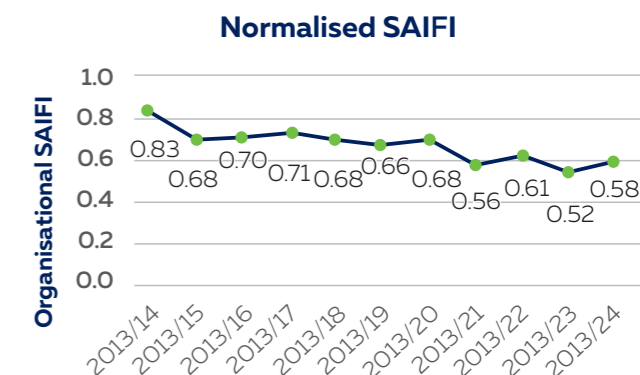
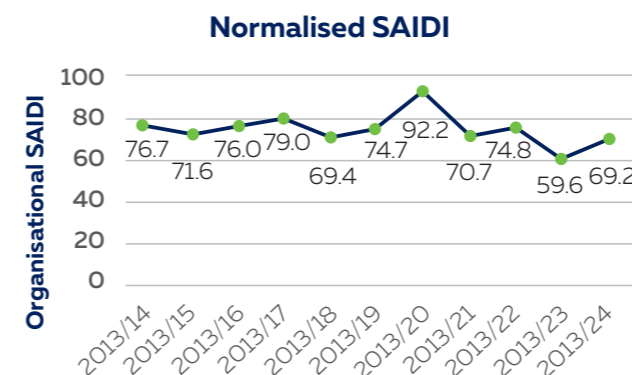
Network Performance

Network Supply Reliability Performance in the Preceding Year

Ausgrid's objective is to comply with regulatory requirements at minimum cost, given the condition and utilisation of existing network assets and the funding available to maintain and augment the electricity network.

System Average Interruption Duration Index (SAIDI) & System Average Interruption Frequency Index (SAIFI)

Performance The following graphs depict the normalised (i.e. Major Event Days data excluded) SAIDI and SAIFI trends over the 10-year period 2013/14 to 2023/24.



Major Event Days

Ausgrid uses the methodology described in IEEE 1366 standard for defining Major Event Days, as outlined in the Reliability and Performance Licence Conditions and AER Service Target Performance Incentive Scheme (STPIS) Definitions.

There were four Major Event Days for 2022/23.

Major Event Days During 2023/24		
Date	Excluded SAIDI	Cause of Major Event Day
30/08/2023	3.01	Storm
06/04/2024	5.10	Storm

Quality of Supply Standards

Ausgrid's objective is to achieve the best supply quality of our electricity network within available funding, asset conditions and utilisation. Ausgrid's network standard NS 238 Supply Quality³ sets out Ausgrid's standards for Quality of Supply which customers can expect from the network. Ausgrid does not control the frequency supplied through its network. The Australian Energy Market Commission (AEMC) establishes standards and regulates the frequency of supply⁴ on the national grid.

Corrective Action Planned to Meet Quality of Supply Standards

Supply Voltage Measurements on the LV network indicate that several sites exceed the V99% target voltage as per AS 61000.3.100. Ausgrid has expanded the use of smart metering data and distribution monitoring systems, focusing on identified areas with voltage issues. As part of the 230 Volt transition, Ausgrid is currently taking numerous activities to improve voltage issues and ensure network compliance. These include:

- Developing analytical tools combining network models with measurements to address voltage challenges due to increasing connections of Renewable Energy Resources.
- Lowering of the zone substation 11kV float voltages.
- Adjusting distribution transformer tap settings and phase balancing to deliver the correct 99th percentile voltage (to AS 61000.3.100) as part of the voltage management initiative including network investments, digital capabilities and incentives.

Flicker, Harmonic and Unbalance Ausgrid monitors customer complaints and resolves any supply quality issues as they arise.

3. <https://www.ausgrid.com.au/-/media/Documents/Technical-Documents/NS/ns238.pdf>

4. <https://www.aemc.gov.au/australias-energy-market/market-legislation/electricity-guidelines-and-standards/frequency-0>

Asset Management

Asset Management

Ausgrid has in place an effective Asset Management System and practices applied across all levels of the organisation to align and deliver Ausgrid's vision. Ausgrid's Asset Management Objectives consist of:



This approach also ensures we comply with the National Electricity Objective and our regulatory and legal requirements, such as WHS Act 2011 and associated regulations, the Electricity Supply (Safety and Network Management) Regulation 2014 (NSW), the NEL and the ESA 1995 (NSW).

Our asset management system, aligned with AS ISO 55001:2014 adheres to Distribution Licence Conditions.

This structured approach to asset management ensures that we continue to deliver on our vision and meet the goals of our customers, shareholders and employees.

Risk Management

Ausgrid employs structured risk assessments in accordance with the Risk Management Board Policy and Risk Management Framework. Ausgrid's asset management approach utilises risk management techniques to support decision making, within the organisation's Risk Appetite Statement.

Risk management techniques applied to inform asset decision making consistent with the organisation's legislative responsibilities and AS/NZS ISO 31000-2018 Risk Management – Principles and Guidelines for managing risk. Ausgrid applies numerous techniques for managing risk at various scales, leading to various decision pathways across the life cycle of an asset. The asset management system draws on AS/NZS IEC 31010:2020 Risk management – Risk assessment techniques (IEC 31010) to guide a structured approach to decision making. Risk management techniques such as reliability centred maintenance and cost benefit analysis are used to evaluate risks and determine maintenance and investment requirements respectively.

A brief overview of significant asset class investment strategies is outlined below:

Subtransmission Cable Strategy	11kV Switchgear Strategy	Additional Replacement Programs
<ul style="list-style-type: none"> Ausgrid has a large amount of sub-transmission cables with the majority operating at either 33kV or 132kV and a small number at 66kV There are four cable technology types used including self-contained fluid filled (SCFF), gas pressure, paper lead insulated and cross-linked polyethylene (XLPE) XLPE cables are the current technology being installed for 33kV, 66kV and 132kV circuits. SCFF, Gas pressure and paper lead cables undergo an extensive cost-benefit analysis to determine retirement/replacement date, based on age, technology, unavailability, condition, restoration/repair time, environmental risks and unserved energy. 	<ul style="list-style-type: none"> Ausgrid has a large number of compound insulated and air 11kV switchboards with bulk oil circuit breakers (OCB) in place. To enhance safety, reliability, and prevent secondary asset damage, 11kV oil-filled circuit breakers in zone substations have been replaced with vacuum equivalents where feasible. Application of cost benefit analysis to the age and condition issues associated with 11kV compound switchboards, confirm that these are approaching end of life. Currently internal arc classified switchgear is being installed in substations as the industry standard. 	<ul style="list-style-type: none"> Condition based replacement of poles, Replacement of higher risk overhead conductor types, Reconfiguration of low voltage streetlight mains (conversion to regular mains supply), and Replacement of low voltage underground cable types with conditions/reliability issues.

Distribution Network Losses

Distribution network losses refer to the difference in energy obtained from the transmission network to that supplied to customers. Ausgrid's distribution network losses as a percentage of total energy for the 2022/23 financial year was 3.25%⁵.

5. The distribution network losses are reported at the end of each calendar year, using the previous financial year's accumulated loss data.

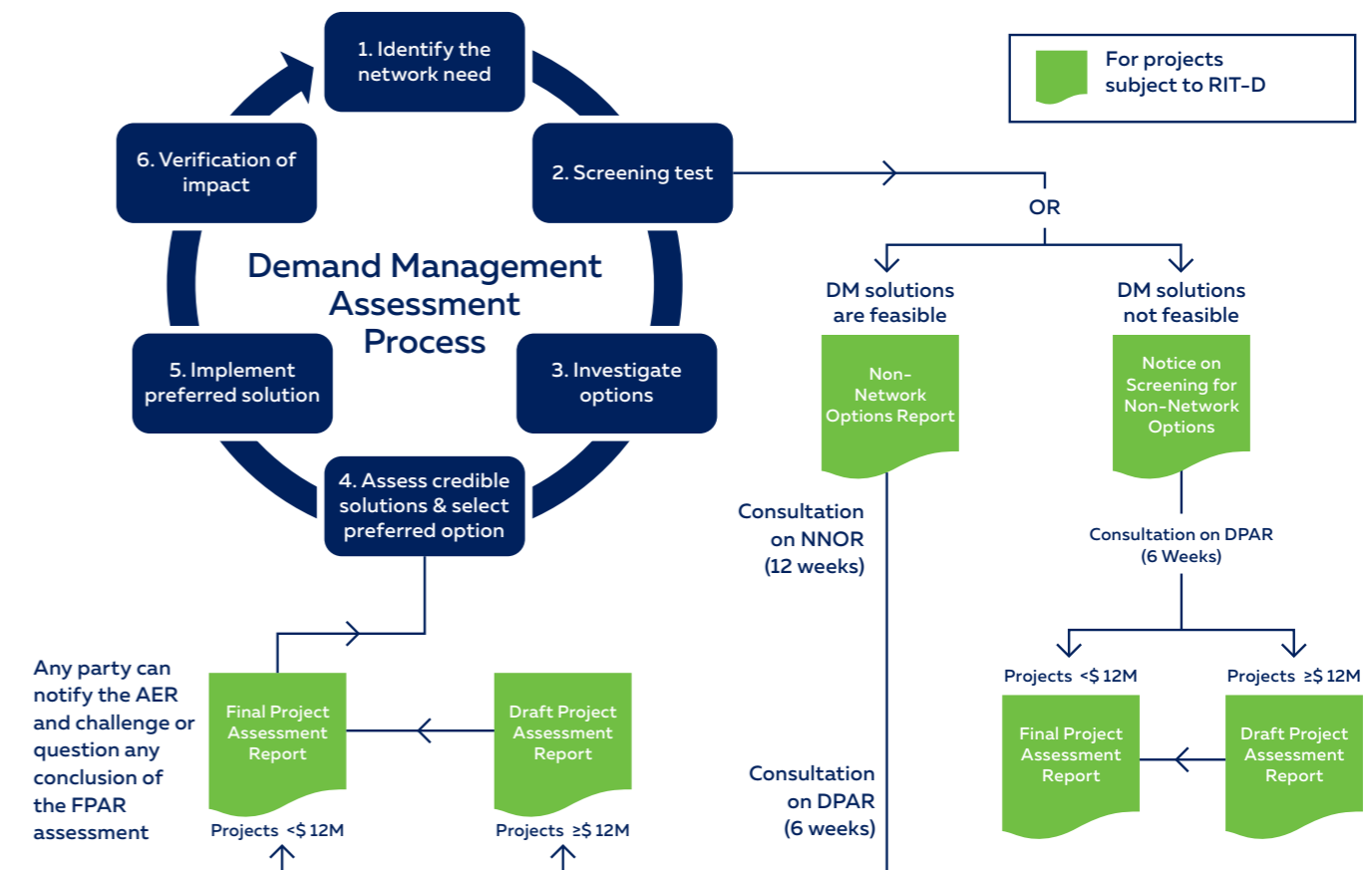
Non-Network Opportunities

When Ausgrid identifies a network limitation, SAPS and non-network options are considered as an alternative to address the limitation with a network option. The implementation of a non-network option is commonly referred to as demand management.

There are a range of demand management solutions available for use by electricity networks:

- Energy efficiency
- Demand response
- Operating embedded generators
- Energy storage
- Power factor correction
- Shifting equipment use from peak to non-peak periods
- Converting the appliance energy source from electricity to an alternative
- Operating customer inverters in voltage support modes

Network options, SAPS, non-network options or their combinations are considered to address network limitations. The goal is to identify the solution which offers the highest net benefit and meets required reliability standards. Ausgrid consults with the community on larger projects about network requirements and potential non-network options. For projects where the cost of any credible options is greater than \$6 million, the RIT-D process is followed. The demand management process is illustrated in the figure below.



Demand Management Considerations

There are 15 projects in the forward planning period which met Ausgrid's criteria for demand management consideration. A high-level assessment for non-network solutions has determined that no major projects were identified where it was considered likely that demand management would form part of the least cost solution.

It should be noted that the level of analysis is of a high-level nature. A full assessment will be conducted as part of the RIT-D process, including a request for submissions via the Non-Network Options Report or equivalent, for each of the projects listed in the Network Investments section at the relevant time.

Demand Management Activities in 2023-24

There were no demand management projects initiated or implemented in this period that were linked to a network investment need.

Innovation Projects

- Hot Water Load Control
- Peak Time Rebate (retailer demand response)
- Community Battery Feasibility Study & Research
- Project Edith Customer Payments
- Barriers to Electrification Study
- Commercial & Industrial Thermal Load Flex
- Heat Pump Hot Water Systems

Demand Side Engagement

Our main channel of engagement is the quarterly e-newsletters to inform about demand management initiatives. Past e-newsletters can be viewed on our Keep Informed page at

<https://www.ausgrid.com.au/Industry/Demand-Management/Demand-management-news>

Members of our demand management engagement register were notified about our RIT-D projects and invited to submit comments/proposals. Notifications can be viewed at

<https://www.ausgrid.com.au/Industry/Regulation/Network-planning/Regulatory-investment-test-projects>

For further information on our demand management activities please contact us at

demandmanagement@ausgrid.com.au

Embedded generation enquiries and connection applications in 2023-24

2 Applications to connect received under NER clause 5.3A.9

13 Connection enquiries received under NER clause 5A.D.2 (micro or non-registered embedded generators)

21 Connection enquiries received under NER clause 5.3A.5

39,561 Applications for a connection service under NER clause 5A.D.3 (micro or non-registered embedded generators)

17 months was the average time taken to complete applications to connect

Network Investments

This section outlines activities related to the application of the RIT-D to network investments.

RIT-D assessments completed in the preceding year

Region	Constraint	Project Name	Expected Project Completion	Estimated Cost (\$m)	RIT-D completion date
Sydney	Asset Condition	132kV Feeders 9E1 & 9E2 Sydney East-Kuringai STS oil sections replacement	Dec-25	7.8	29/09/2024
Sydney	Load Growth	NEW Wallumatta STS & 132kV Feeders (Contingent Project)	Dec-28	162.3	10/11/2024

No RIT-D assessments are currently in progress.

RIT-D assessments to be completed in the forward planning period

Region	Constraint	Project Name	Expected Project Completion	Estimated Cost (\$m)	Indicative RIT-D initiation
Distribution Assets					
Sydney	Asset Condition	Darlinghurst ZS 33kV Feeders 386 & 389 Replacement	Mar-28	7.7	FY26
Sydney	Asset Condition	Botany ZS 11kV switchgear replacement	Dec-28	9.0	FY26
Sydney	Asset Condition	Willoughby STS 33kV switchgear replacement	Sep-29	42.5	FY26
Hunter	Asset Condition	Merewether STS 33kV switchgear replacement	Sep-29	28.9	FY26
Sydney	Asset Condition	Blakehurst ZS Decommissioning	Sep-29	24.6	FY27
Sydney	Asset Condition	132kV feeder 202 Rozelle STS-Drummoyne ZS replacement	Sep-30	19.6	FY27
Sydney	Asset Condition	132kV feeders 203 & 204 Mason Pk STSS-Drummoyne ZS replacement	Sep-30	53.2	FY27
Sydney	Asset Condition	Drummoyne ZS 132kV switchgear replacement	Sep-30	17.8	FY27
Sydney	Asset Condition	Lidcombe ZS 11kV switchgear replacement (Group 1)	Sep-30	15.5	FY28
Sydney	Asset Condition	Leightonfield ZS 11kV switchgear replacement	Sep-30	6.8	FY28
Sydney	Asset Condition	Paddington ZS 33kV feeders replacement	Mar-31	11.1	FY29
Sydney	Asset Condition	132kV Feeder 283/2 Milperra ZS - Revesby ZS	Sep-32	13.2	FY30
Dual Function Assets					
Sydney	Asset Condition	132kV Feeders 91A & 91B Beaconsfield BSP to St Peters ZS	Sep-29	20.3	FY27
Sydney	Asset Condition	132kV Feeder 9FF Beaconsfield BSP - Bunnerong STSS oil section replacement	Dec-29	23.5	FY27
Sydney	Load Growth	New 132kV Mascot STSS	Dec-29	31.3	FY27

Indicative RIT-D assessments to be completed beyond the planning period

Region	Constraint	Project Name	Expected Project Completion	Estimated Cost (\$m)	Indicative RIT-D initiation
Distribution Assets					
Hunter	Asset Condition	Cardiff ZS 11kV switchgear replacement	Sep-33	9.2	2031
Sydney	Asset Condition	Pymble ZS 11kV switchgear replacement	Sep-33	23.4	2031
Sydney	Asset Condition	Surry Hills ZS 33kV Feeders 383, 384 & 385 Replacement	Jun-34	10.5	2031
Sydney	Asset Condition	Matraville ZS 33kV Feeders 313, 318, 324 & 340 Replacement	Jun-34	10.0	2031
Sydney	Asset Condition	Riverwood ZS 11kV switchgear replacement	Sep-35	11.2	2032
Sydney	Asset Condition	Miranda ZS 11kV switchgear replacement	Sep-35	13.5	2032
Sydney	Asset Condition	Campsie ZS 11kV switchgear replacement	Sep-36	31.2	2034
Dual Function Assets					
Sydney	Asset Condition	132kV Feeder 9SE Beaconsfield BSP - Green Square ZS Replacement	Jun-34	6.6	2032
Sydney	Asset Condition	132kV Feeder 270 Kingsford ZS - Maroubra ZS Replacement	Jun-34	6.5	2032

RIT-D assessments not proceeding

Region	Constraint	Project Name	Expected Completion	Reason for RIT-D not proceeding
Distribution Assets				
Sydney	Power Quality	Installation of new Static Compensation at Waratah STS	FY28	Project is no longer required due to closure of steel factory causing the power quality issue
Sydney	Asset Condition	132kV Feeders 92X & 92C, 91X/2 & 91Y/2 Chullora STSS - St Peters ZS/ Marrickville ZS retirement	FY28	The retirement of these oil-filled cables has already been covered by the Powering Sydney's Future RIT-T jointly published with Transgrid in 2017

Completed or cancelled investments during the preceding year

Load Area	Completed Network Investments	Investment Status
Distribution Assets		
Sydney CBD	11kV Load Transfers from Dalley St ZS to City North ZS	Completed
Eastern Suburbs	Decommission Darlinghurst 33/11kV ZS - Stage 1	Completed
Inner West	New Summer Hill 33/11kV ZS and associated 33kV feeders and decommission Dulwich Hill 33/11kV ZS	Completed
Inner West	Rozelle STS new 33kV switchgear	Completed
Camperdown & Blackwattle Bay	Convert Blackwattle Bay load from 5kV to 11kV and load transfer and decommission 33/5kV Blackwattle Bay ZS	Completed

New Network investments committed in 2024

Load Area	Committed Refurbishment, Replacement or Augmentation Investments	Expected Completion	Estimated Cost (\$m, nominal)
Distribution Assets			
Caterbury & Bankstown	Milperra ZS 11kV switchgear replacement	Dec-28	16.5
Dual Function Assets			
Carlingford	NEW Macquarie STS Transformer 3	Dec-25	13.6

Values excluding contingency

2.7 Urgent and unforeseen investments

No distribution or dual function network projects required to address an urgent or unforeseen network issue.

Information and Communications Technology Systems Investments

Information, Communication and Technology

Ausgrid relies on Information, Communication, and Technology (ICT) for crucial network operations, enabling effective asset management planning, regulatory compliance, and statutory reporting obligations.

ICT systems play an integral role in functions such as asset lifecycle management, asset operations, customer and market management and financial reporting, with Supervisory Control and Data Acquisition and Network control systems crucial for monitoring and managing the electrical network.

ICT also allows Ausgrid to prudently adopt and effectively implement technology, leading to improved services to network customers and reduce costs over time.

Advanced Distribution Management System

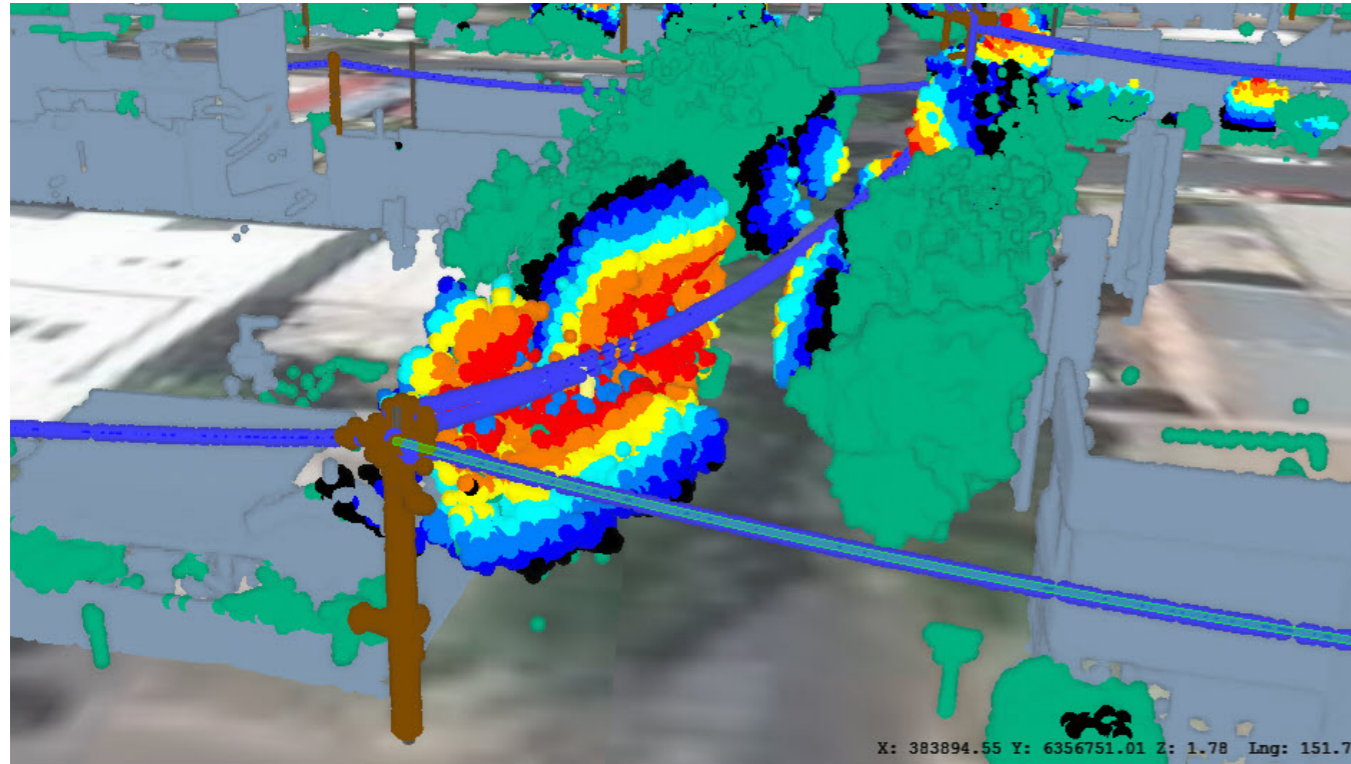
Ausgrid relies on the ADMS to manage its distribution network. The ADMS platform allows for remote monitoring, control, outage management, improve planned and emergency event management, and fault location optimisation. Core monitoring and control functions were integrated in November 2022, with further enhancements planned to replace older technologies.

The overall program is delivered via a phased approach which has been adopted to mitigate the risks of a large technology rollout and to allow the business time to adapt to the ADMS functionality across three phases, each building upon new capability acquired in the prior phase.

Key ICT systems support the following Ausgrid core business functions:



Network Asset Digitisation



The Network Digitisation Program is at the forefront of providing network insights through cutting-edge technology.

Phase 1 | Concludes in 2024

- Phase I of the program has focused on delivering innovative solutions to enhance the understanding of Ausgrid's overhead poles and wires network.
- This phase has utilised drones, helicopters and ground vehicles to capture detailed data, creating a new digital twin of the network.
- By integrating new data and leveraging artificial intelligence and machine learning algorithms, the program will provide new insights into the network's performance and condition.

Phase 2 | FY25+

- This phase aims to implement and embed the insights gained from Phase I while expanding the program's scope.
- Phase II will include the underground network, incorporate more advanced AI analysis, and focus on acquiring and sharing data with customers and other stakeholders more effectively.
- This holistic approach promises to further enhance the efficiency and reliability of the network, putting downward pressure on prices and improving customer experience into the future.

Planning Coordination

Joint Planning is carried out with other Network Service providers, in particular Transgrid, Endeavour Energy and Essential Energy.

Joint Planning Completed in 2024

Transgrid	<p>Sydney Inner Metropolitan Transmission Load Area The Sydney Inner Metropolitan transmission network faces constraints in two critical areas:</p> <ol style="list-style-type: none"> Transmission Corridor 1 ('TC1') - Transmission supply into Beaconsfield BSP from Bulk Supply Points at the edge of the city, Sydney South, Sydney North, and Rookwood Rd BSP. Transmission Corridor 2 ('TC2') - Transmission supply into Haymarket BSP and surrounding Ausgrid 132kV zone substations from Sydney South BSP (Cable 42) and Ausgrid 132kV connections from Beaconsfield BSP and the meshed 132kV network. <p>Both corridors have limitations due to the age and condition of existing circuits, including reduction in capacity of cables. The preferred strategy after consultation is the Powering Sydney's Future strategy. Commissioning of the first stage was completed in June 2022. This includes the first 330kV cable and operating 330kV cable 41 at 132kV. The first stage of decommissioning Ausgrid's cables has been completed. Early development work is now starting on the second stage of this project.</p>
	<p>Other Transmission Load Areas Transgrid's Sydney East 330/132kV BSP Secondary Systems require replacement, requiring Ausgrid to carry out works on the Ausgrid end of the impacted feeders. Ausgrid is facilitating the required protection replacement works on all affected Ausgrid feeders. Protection upgrades are expected to coincide with Transgrid's program of works at Sydney East BSP which are scheduled for completion by 2027/28.</p>
	<p>Voltage Planning Voltage specific joint planning stream has continued this year. This concept provides for a BSP to LV customer planning approach for our whole network whilst aligning with the upstream Transgrid voltage requirements, resulting in improved voltage issues and DER hosting capacity.</p>
	<p>Embedded Generation Planning A number of large embedded generator and Battery Energy Storage System connections to the Ausgrid network has and may require joint planning and assessment with Transgrid.</p>
Endeavour Energy	<p>Discussion at joint planning meeting focused on:</p> <ul style="list-style-type: none"> Connections of major loads like data centres, EV charging hubs, focusing on allocation and prioritisation of the network capacity considering flexible connection arrangements. Conducting analysis of feeder 926/927 supply to Endeavour Energy owned Carlingford transmission substation. Treatment of Inverter Based Load (IBL) and generator connections assessment in particular modelling architecture, wide area model studies and system strength. Updating Connection Agreement Databook to include existing and proposed Inter distributor supply and cross border arrangements. Proposal for forecast methodology to be inclusive of Distributed Energy Resources (DER)
Essential Energy	<ul style="list-style-type: none"> The connection points were reviewed and the ownership of assets at each connection point was confirmed, with the intention of updating the connection agreement. Concerns regarding load growth at Clarence Town which may require an increase to the export/import capacity at two connection points. The capacity of all connection points related to Brandy Hill zone substation, particularly with the emergence of multiple Battery Energy Storage Systems to be connected to the 11kV network is to be reviewed.

Planned Joint Network Investments

Transgrid	<ul style="list-style-type: none"> Replacement of the shunt reactor at Sydney East BSP due to condition issues. Voltage and power factors need to be managed at Sydney East BSP. Potential installation of a new shunt reactor at Beaconsfield BSP due to Ausgrid experiencing high voltages and leading power factor. Investigations will continue in 2024.
Endeavour Energy	<ul style="list-style-type: none"> Supply to Ausgrid's Auburn and Lidcombe Zone Substations from Endeavour Energy's Camellia Transmission Substation.
Essential Energy	<ul style="list-style-type: none"> No jointly planned network investments with Essential Energy in the preceding year

Correspondence

www.ausgrid.com.au

For all enquiries regarding the Distribution and Transmission Annual Planning Report 2024 and for making written submissions contact:

Ausgrid Head of Asset Management & Planning

GPO Box 4009 Sydney NSW 2001

Email: assetinvestment@ausgrid.com.au

ABN: 78 508 211 731

