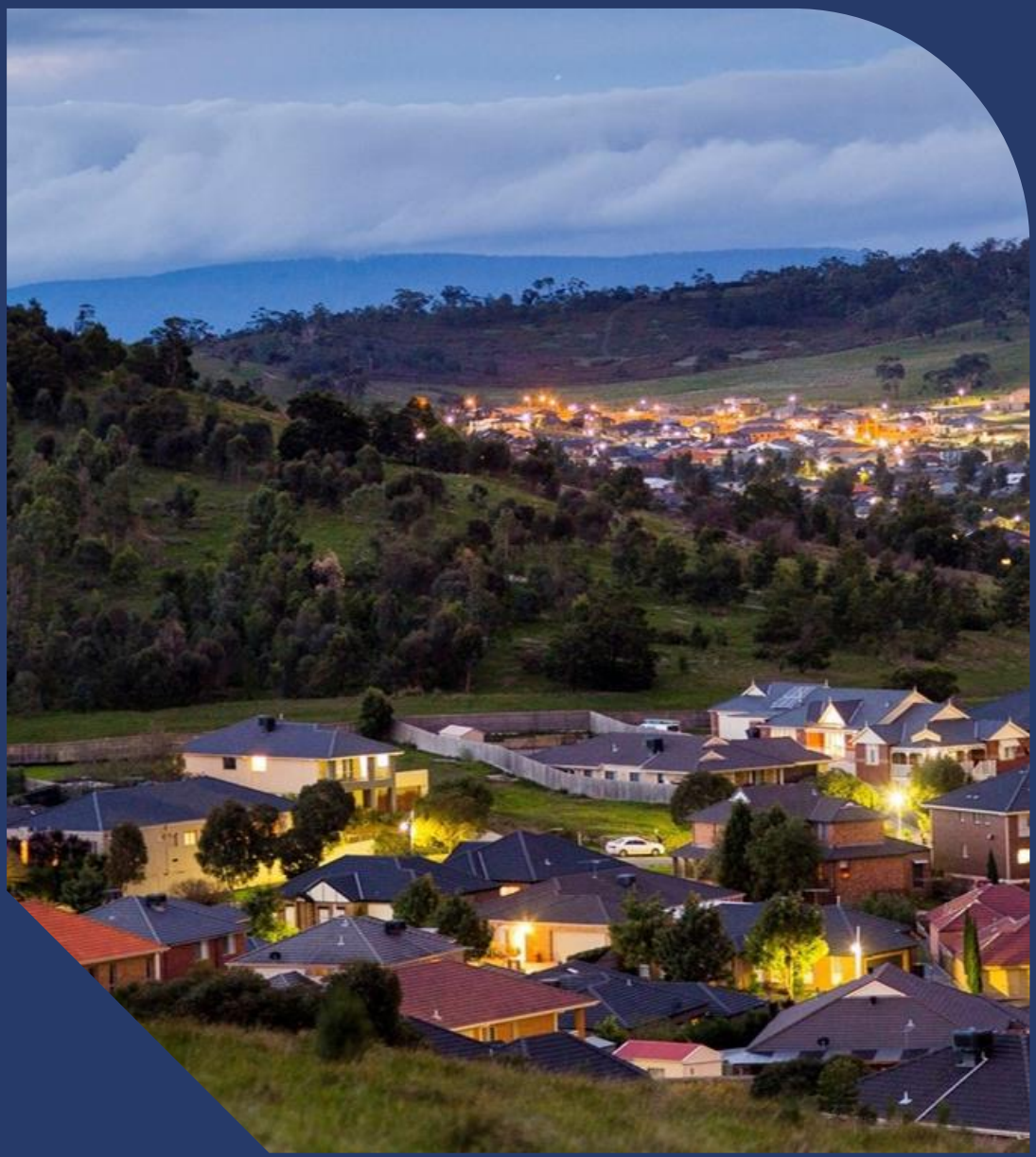
AusNet

Asset Management Strategy

AMS – Electricity Distribution Network



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AusNet

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1. Purpose

The electricity distribution network asset management strategy (AMS) and its supporting documentation provide robust technical direction for the responsible stewardship of electricity distribution assets. AusNet is steward of these assets on behalf of Victoria's energy users, generators, shareholders, regulators, government and more broadly, the National Electricity Market (NEM).

The AMS has the following key functions:

- To set the framework for AusNet's holistic approach to management of network assets, and in so doing establish the linkages with and between the underpinning detailed strategies, processes and plans; and
- To provide important context for management strategies, by considering the demand for network services, the condition of network assets and expected trends into the future. It therefore also has regard to the network augmentation planning process.

As the output of a strategic assessment management process, the AMS sets out the significant Asset Management Drivers (Section 7.) as well as Electricity Distribution Asset Management Objectives (Section 8.) and Network Performance (Section 9.) and Process and System Strategies (Section 10.).

The AMS is central to AusNet's processes for delivery of network services to customers safely and reliably in accordance with AusNet's Asset Management Policy. It provides authoritative guidance for the development of asset management works programs. Further, the AMS seeks to provide contextual information for the asset strategies that will enhance the skills, resources and knowledge employed at AusNet, and thereby facilitate efficient network development and asset management.

The information presented in the AMS also extends to longer term expectations for technological advancement of network assets, the functionality of the network and evolution of management approaches.

2. Scope

This AMS covers AusNet's electricity distribution assets operating across Victoria, including:

- Sub-transmission and distribution lines[1], associated easements and access tracks;
- Distribution zone substations, switching stations, communication stations and depots including associated electrical plant[2], buildings and civil infrastructure;
- Protection, control, metering and communications equipment;
- Related functions and facilities such as spares, maintenance and test equipment; and
- Asset management processes and systems such as System Control and Data Acquisition (SCADA) and asset management information systems (including SAP and SDMe).

More specifically, the AMS relates to:

- All assets in the distribution area providing network services to customers that are identified in the electricity distribution licence issued by the Essential Services Commission (ESC)[3].

This AMS excludes the Victorian electricity transmission network and assets and infrastructure owned by:

- Embedded generators;
- Exit customers;
- Other companies providing distribution services within Victoria; and
- Customer-owned assets including Private Overhead Electric Lines (POELs).

This AMS also excludes AusNet's corporate processes and associated information technology systems such as business communication, human resources and financial management systems.

It does not include information on corporate offices or general business equipment such as computers and motor vehicles.

[1] 66kV and 22kV, 12.7kV, 11kV, 6.6kV conductors and cables
[2] Primarily 66kV and 22kV switchgear and transformers
[3] AusNet Electricity Services Distribution Licence 20080506

3. Relationship to other AMS Documents

AusNet's asset management system, including the policy, objectives and its underlying methodology, context, process, decision making criteria and certification are detailed in *AMS 01-01 Asset Management System Overview*.

This electricity distribution network asset management strategy is one of several asset management related documents. It provides more specific information on the issues and strategies specific to the electricity distribution network.

The suite of documents together comprises the Asset Management System as represented in Figure 1.

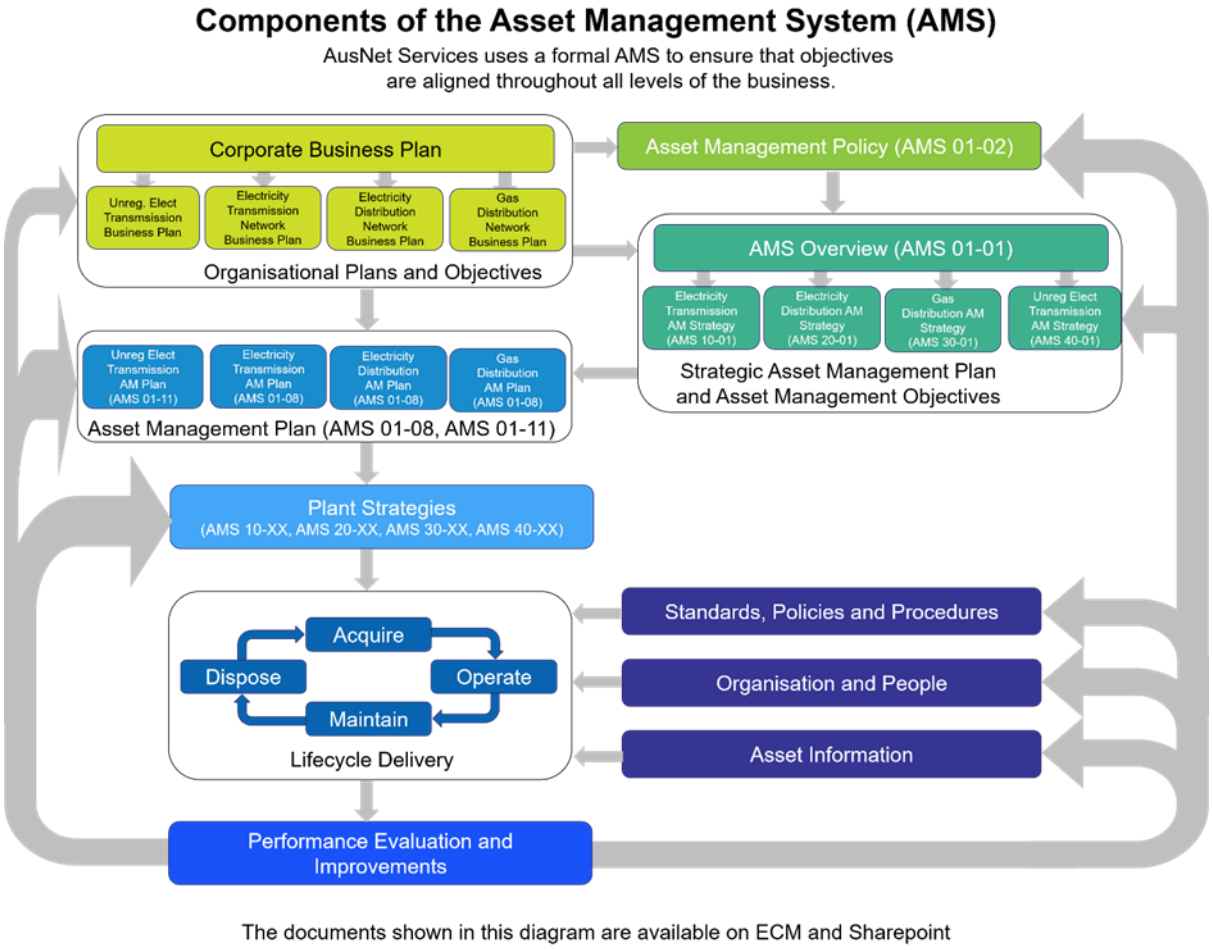

Figure 1: Asset Management System Document Interdependencies

4. Organisational Context

4.1.1. Regulatory Framework

AusNet's distribution network is subject to economic and technical regulation, which is the responsibility of the Australian Energy Regulator (AER) and Energy Safe Victoria (ESV) respectively.

Economic regulation is subject to a national regulatory framework. The framework is governed by the National Electricity Law (NEL) and contained in the National Electricity Rules (Rules). The governance framework is intended to be consistent with the National Electricity Objective (NEO) set out in the NEL which states:

> *The objective of this Law 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.*

The Australian Energy Markets Commission (AEMC) has responsibility for development of the Rules, and the AER is responsible for regulation of industry participants in accordance with the Rules.

The National Electricity Objective (NEO) guides the development of the Rules and the decisions of the AER. The NEO 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."

The Electricity Safety Act (1998) requires AusNet to:

> *… design, construct, operate, maintain and decommission its supply network to minimise as far as practicable:*
>
> *(a) the hazards and risks to the safety of any person arising from the supply network; and*
>
> *(b) the hazards and risks of damage to the property of any person arising from the supply network; and*
>
> *(c) the bushfire danger arising from the supply network.*

4.1.2. Australian Energy Regulator (AER)

The AER's regulatory functions and powers are conferred upon it by the NEL, and it must act in accordance with its obligations under the Rules (as must industry participants).

The AER's key responsibilities include:

- Regulating the revenues of transmission and distribution network service providers;
- Monitoring the electricity wholesale market;
- Monitoring compliance with the NEL, Rules and national electricity regulations;
- Investigating breaches or possible breaches of provisions of the NEL, Rules and national electricity regulations and instituting and conducting enforcement proceedings against relevant market participants;
- Establishing service standards for electricity transmission network service providers;
- Establishing ring-fencing guidelines for business operations with respect to regulated Transmission services; and
- Exempting network service providers from registration.

Regulatory proposals (i.e., revenue applications) to the AER are assessed against, amongst other things, the operating expenditure objective and the capital expenditure objective (Clauses 6.5.6 (a) and 6.5.7 (a) of the Rules).

Accordingly, Distribution Network Service Providers (DNSPs) are required to submit the total forecast operating expenditure and capital expenditure.

The applicable criteria for the expenditure forecasts are:

(1) meet or manage the expected demand for standard control services over that period;

(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;

(3) maintain the quality, reliability and security of supply of standard control services; and

(4) maintain the reliability, safety and security of the distribution system through the supply of standard control services[4].

4.1.3. Essential Services Commission of Victoria (ESCV)

Although most economic regulatory functions transferred to the AER in 2009, the ESCV retains jurisdiction over our Distribution Licence and the Victorian Distribution Code. These instruments cover technical and asset management matters including planning reports, power quality, reliability and customer service obligations and jurisdictional schemes such as GSL.

Since 2015, the ESCV has taken an increasing interest in asset management performance during extreme events leading the State Government review into the 2019 Australia Day outages. More recently, they have resumed assessment of GSL exemption applications.

4.1.4. Energy Safe Victoria (ESV)

ESV is an independent Victorian statutory authority responsible for the safe generation, supply and use of electricity, gas and pipelines in Victoria.

The objectives of ESV relevant to electricity networks are to:

- Ensure the electrical safety of electrical generation, transmission and distribution systems, electrical installations and electrical equipment;
- Control the electrical safety standards of electrical work carried out by electrical workers;
- Promote awareness of energy efficiency through energy efficiency labelling of electrical equipment and energy efficiency regulation of electrical equipment;
- Promote the prevention and mitigation of bushfire danger;
- Protect underground and underwater structures from corrosion caused by stray electrical currents; and
- Maintain public and industry awareness of electrical safety requirements.

From time to time, ESV may issue directives to give effect to these objectives.

The Electricity Safety Act 1998 requires AusNet to:

> *"…design, construct, operate, maintain and decommission its supply network to minimise as far as practicable:*
>
> *(a) the hazards and risks to the safety of any person arising from the supply network; and*
>
> *(b) the hazards and risks of damage to the property of any person arising from the supply network; and*
>
> *(c) the bushfire danger arising from the supply network".*

The Electricity Safety Act also requires major electricity companies to submit to the ESV for approval, an Electricity Safety Management Scheme (ESMS) which complies with Part 10, Division 2 of the Electricity Safety Act 1998 and Electricity Safety (Management) Regulations 2009 in respect of safety in design, construction, operation, maintenance and decommissioning of AusNet Service's electricity transmission network.

Further information can be found in *ESMS 20-01 Electricity Safety Management Scheme*.

[4] AEMC – National Electricity Rules: 6 Economic Regulation of Distribution Services

4.1.5. Codified Areas

In 2016, the *Electrical Safety (Bushfire Mitigation) Regulations 2013* were updated to introduce "electric line construction areas", shown in red in Figure 2.

On 16 June 2023, the Electricity Safety (Bushfire Mitigation) Regulations 2023 (new Regulations) came into effect, based on the preferred option (Option 3B) detailed in the Regulatory Impact Statement (RIS). Their implementation is being managed by Energy Safe Victoria (ESV).

Previously, the Department of Energy, Environment and Climate Action (DEECA) released a RIS to determine the best approach for remaking the Electricity Safety (Bushfire Mitigation) Regulations 2013 (2013 Regulations).

The new Regulations are substantially the same as the 2013 Regulations with some minor administrative amendments, and other changes to provide greater clarity and certainty for prescribed safety requirements for existing and new electrical constructions and installations. These areas have been identified as the highest risk areas of the state by the Victorian Government. They have been selected based on maximum potential bushfire impact, ease of access and egress, and terrain.

These areas are referred to as "Codified Areas" within AusNet.

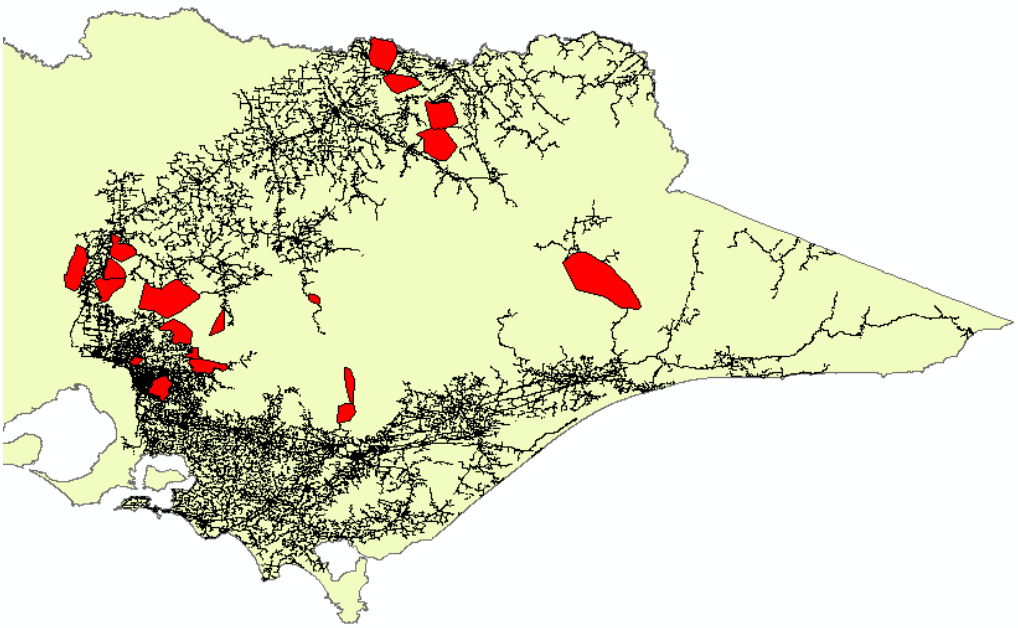

Figure 2: AusNet's Codified Areas

There are 19 such areas in the AusNet electricity distribution network covering 21,000 poles and 1,733km of conductor.

Specific regulations apply to codified areas including financial penalties for fire ignitions and restrictions on the types of technology which can be installed within them.

They have also been targeted for capital replacement programs as part of the Powerline Bushfire Safety Program and as part of our proactive SWER/bare conductor replacement programs being delivered in the 2021-2026 regulatory period and proposed for the 2027-31 period.

4.1.6. Rapid Earth Fault Current Limiters

In 2016, new bushfire mitigation regulations were introduced mandating the installation of Rapid Earth Fault Current Limiters (REFCLs) on electricity distribution networks. REFCLs are designed to detect phase to earth faults on the network and quickly isolate them, thereby limiting the current which goes to ground and hence reducing the probability of fire ignition.

AusNet has met its obligations by installing REFCLs at 22 zone substations in three tranches by the end of 2023. This program, being undertaken concurrently by AusNet and Powercor, is the first time anywhere in the world that REFCLs have been installed for the purpose of bushfire mitigation.

REFCL's operate like a safety switch, rapidly cutting power to fallen or damaged powerlines, reducing the risk of bushfires. AusNet's 22 REFCLs cover more than 40,000 square kilometres, protecting over 18,000 kilometres of electrical powerlines and 300,000 AusNet customers. The $500 million REFCL bushfire mitigation program, reduces bushfire risk and helps keep communities safe.

The introduction of REFCLs onto AusNet's network also required several programs of preparatory work to be carried out:

(1) To operate correctly, the capacitance on different phases of a polyphase network must remain in balance. This limits the alterations to technology and construction which can be applied to REFCL protected sections of the network and constitutes an additional constraint in system design.

(2) The requirement to maintain balancing affects the effective operation of AusNet's Distribution Feeder Automation (DFA) scheme. Additional switch upgrades are required to maintain switching capability.

(3) In additional to balance capacitance between phases, the total capacitance which can occur on a downstream network is limited to the size of the Arc Suppression Coil of a REFCL. This limits the amount of high capacitance cable which can be installed on a feeder. To overcome this, additional zone substations, REFCL's or isolating transformers must be installed.

(4) Isolating transformers are also required at HV customer sites where connection voltages will be impacted by REFCL operation.

(5) Hardening of the network to withstand higher voltages during the operation of the REFCL during fault conditions.

4.2. Stakeholders

Table 1 summarises key stakeholders and their expectations of the service provided by AusNet's distribution network.

Table 1:Energy network stakeholders and expectations

Asset Owner	• Compliance with contract • Reliable information
Connected Parties **(Energy consumers, electricity generators and gas producers, other network service providers)**	• Network access • Efficient service costs with minimum increases • No network related fire or safety issues • Reliability, uninterrupted energy supply • Efficient, well-planned investment and expenditure • Proactive and responsive network planning • Reliable information and effective engagement
Community	• Public safety • Reliable and secure energy supply • Environmental performance within Code • Minimal traffic disruptions • Protected infrastructure • Community consultation

Employees and contractors	• Safe workplace • Reward and recognition • Skill development
Shareholders	• Return on investment • Growth in investment value • Commensurate opportunities, liabilities, and risks
Energy Retailers	• Reliable information • Efficient service costs
Safety Regulator	• Compliance with Acts, Regulations and Codes • Improving safety performance • Transparent processes • Reliable information
Economic Regulator	• Compliance with Acts, Rules and Codes • Efficient service costs • Transparent processes • Reliable information
State and Federal Government	• Compliance with Acts and Regulation • Support economic development and investment • Improving safety performance • Efficient service costs
Local Government and VicRoads	• Coordinated infrastructure development • Coordination of works • Public land reinstatement

The performance of the distribution network is reported to the AER in accordance with the specifications established in the Regulatory Information Notice, Regulatory Accounts and Non-Financial Regulatory Accounts.

Monthly and annual reports are submitted to ESV in accordance with the Electrical Safety Performance Reporting Guidelines.

4.3. Community expectations

To a significant extent, community expectations are represented in the legislative and regulatory frameworks and controls that govern the electricity supply sector. These cover various perspectives of the service locus, including safety, environment, and in particular, the core energy supply service.

There is also a direct relationship between AusNet and the community. For example, AusNet engages in many ways with its customers, and community representatives in eastern Victoria. These relationships provide valuable insights into community expectations. The AER (Australian Energy Regulator) has set clear expectations that good ongoing customer engagement is an expectation for networks. Where good engagement can be demonstrated and proposals clearly reflect customer feedback and preferences, networks can expect accelerated review processes and approvals.

As part of the 2022-2026 regulatory proposal process, AusNet established a Customer Forum. The Customer Forum was a panel of five customer advocate members selected to represent the preferences and perspectives of our customers in developing and negotiating the 2022-2026 regulatory proposal. In addition to engaging with AusNet, the Customer Forum engaged with a range of stakeholders, including customers, other consumer advocate and community groups, to understand their concerns, preferences and priorities.

In preparing its 2026-2031 regulatory submission, AusNet again committed to undertake a broad range of customer and stakeholder engagement to help inform its submission. A key feature of the engagement approach was a series of panels and a Co-ordination Group.

The Co-ordination Group:

- in a transparent manner, works collaboratively with the panels and AusNet, and where necessary challenges AusNet to prepare a high-quality evidence-based proposal reflective of customers' preferences.
- identifies and raises conflicts or overlaps between panels and works collaboratively with AusNet to identify value-stacking opportunities across workstreams, understand and resolve trade-offs for inclusion in the proposal.
- gets into detail on building blocks (incorporating panel inputs) and the price path.
- reflects customers' interests and value in technical considerations of the proposal with a clear line-of-sight from AusNet's research and engagement program.
- authors "independent" report(s) required under the Better Resets Handbook (AER, 2022) covering items such as the effectiveness of the engagement process in identifying customer preferences and the extent to which these are reflected in the Revenue Proposal.

In early 2023 the Stakeholder Reference Group (SRG) was established to provide support to sub-panels and oversight of the overall proposal and engagement process governance. The SRG met monthly between February and May 2023, after which it was refined and reformed as the Co-Ordination Group. All six Co-ordination Group members are also members of one or more panels. The panels engage in greater depth on topics including customer experience, electricity availability, benchmarking and opex, future networks, and tariffs and pricing. The group is overseen by an independent chair.

This stakeholder engagement was supplementary to the in-depth customer research program undertaken by AusNet as part of the 2022-2026 regulatory proposal process, as well as our business-as-usual research program. One of our key business-as-usual research activities is the C-SAT (Customer Satisfaction) (Customer Satisfaction) program, which tracks several leading and lagging indicators of customer satisfaction. The C-SAT program measures customer satisfaction with our key operational interactions, including experience during planned and unplanned outages, new connections and claims and complaints. Another key research activity is the Energy Sentiments survey – a bi-annual survey collecting strategic insights from residential and business customers around energy sentiments and behaviours and tracking their changes over time. Every Autumn and Spring, AusNet ask 300 residential and 100 business customers gas and electricity customers about their:

- attitude towards AusNet and the energy industry generally
- customer experience with various aspects of their gas or electricity supply, and
- energy behaviours and intentions.

The Energy Sentiments survey is often used in conjunction with other information sources to help make business decisions and maintain an up-to-date understanding of how customers are thinking and feeling, and changes to their energy interactions.

We have also been working to better align AusNet's financial incentives (and those of our contractors) to customer outcomes. The Customer Service Incentive Scheme has been in place since 1 July 2021. This regulator-approved incentive scheme ties a financial incentive to AusNet's C-SAT performance, with AusNet receiving a financial incentive for strong performance and a financial penalty for weak performance. We have also tied financial rewards to relevant C-SAT measures to several contractors who deliver field services on our behalf.

Having regard to these community perspectives AusNet considers that the following characteristics broadly represent the community expectations which should flow from asset management strategy:

- A safe network for the public, employees and contractors with zero explosive failures
- Delivery of a reliable and high-quality electricity supply
- Prudent and efficient management of the network meeting regulatory commitments
- Prompt and efficient response to service requests and network incidents
- A secure network with protected infrastructure
- An environmentally sustainable network with minimal environmental impact
- Coordinated planning of network development and asset management activities in consultation with customers and the community
- A responsive network, adapting to changing customer usage patterns and requirements;
- Most cost-efficient solutions to meet the network demand, and
- Continual engagement and provision of accurate information.

In addition, increasing prominence has been given to community resilience in the face of natural disasters, particularly as frequency and intensity is expected to increase with climate change. In Victoria, the 2020 bushfires and 2021 storms in Eastern Victoria have stimulated the community debate on the resilience of the electricity system, in particular. Funding is becoming available to advance community trials of mini-grids and stand-alone power systems as one answer to this issue and AusNet is leading these trials.

4.4. Stakeholder Engagement

At a project level, AusNet has developed a *Stakeholder Engagement Framework SEF 20-01* for key projects. It provides a protocol for engaging with external stakeholders throughout the life cycle of a project.

4.5. Corporate Business Plan

The energy landscape is changing, and AusNet needs to change with it. By responding to the changing operating context, AusNet can deliver more impactful outcomes for our communities and stakeholders, earn the right to grow and create the foundation for a sustainable future.

The energy sector in Australia is undergoing unprecedented changes due to decarbonisation, resulting in a fundamental shift in how energy is produced and consumed. Given AusNet's unique position as an owner and operator of the Victorian high-voltage transmission network, as well as gas and electricity distribution networks, it plays a central role in the decarbonisation of Victoria and is ideally placed to enable and accelerate the once-in-a-generation energy transition currently underway.

In 2024, AusNet published its new enterprise vision and refreshed its purpose and strategy to underpin future business direction. This is summarised in Figure 3.

AusNet's refreshed purpose is to:

Connect communities with reliable, affordable, and sustainable energy.

AusNet's new vision is to be:

Trusted to bring the energy today and build a cleaner tomorrow.

AusNet's strategy is now focussed on three pillars:

Safely deliver our customers' energy needs today

Create the energy network of tomorrow

Enable the transition to a net zero future

These pillars are built on our foundations of people and safety. These are both critical to delivering AusNet's pillars vision.

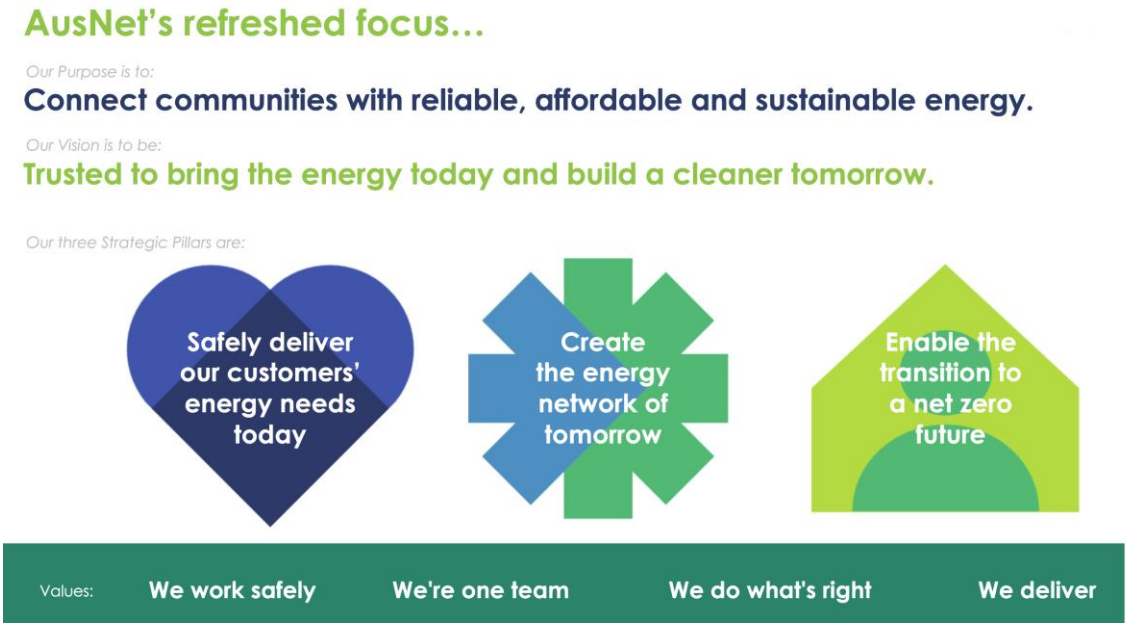

Figure 3: AusNet's refreshed strategy framework

4.6. AusNet's operating model and distribution line of business

In July 2024, AusNet announced a new operating model and Executive Leadership Team to deliver on the company's new vision and provide sustainable outcomes for the communities and customers it serves. AusNet's new vision to be 'trusted to bring the energy today and build a cleaner tomorrow,' has been established to guide the actions and decisions of the company through the energy transition.

Aligned to this, a new leadership team to deliver on this vision and drive an increased focus on delivering improved outcomes for our customers, communities, key stakeholders and our business was established and the operating model refreshed. AusNet's senior leadership team has been structured to provide increased executive focus on four lines of business: electricity transmission, electricity distribution, gas and metering, and contestable energy infrastructure. As a result, AusNet's operating model shifted from a functional operating model to a line of business operating model. Each business leader has been tasked with achieving exceptional performance outcomes for their respective community, customer and stakeholder groups, whilst enabling an efficient energy transition.

The lines of business are supported by enabling functions, to provide strategic guidance and advice which are: People & Safety, Finance & Strategy, Compliance, Risk & Corporate Affairs, Digital & Technology and Group Operations (a new business unit that will guide AusNet to rapidly mature its strategic level technical and operational capabilities, while ensuring cross business coordination and collaboration).

The operating model showing the lines of business and supporting areas is shown in Figure 4 and the accountabilities within AusNet's distribution line of business are shown in Figure 5.

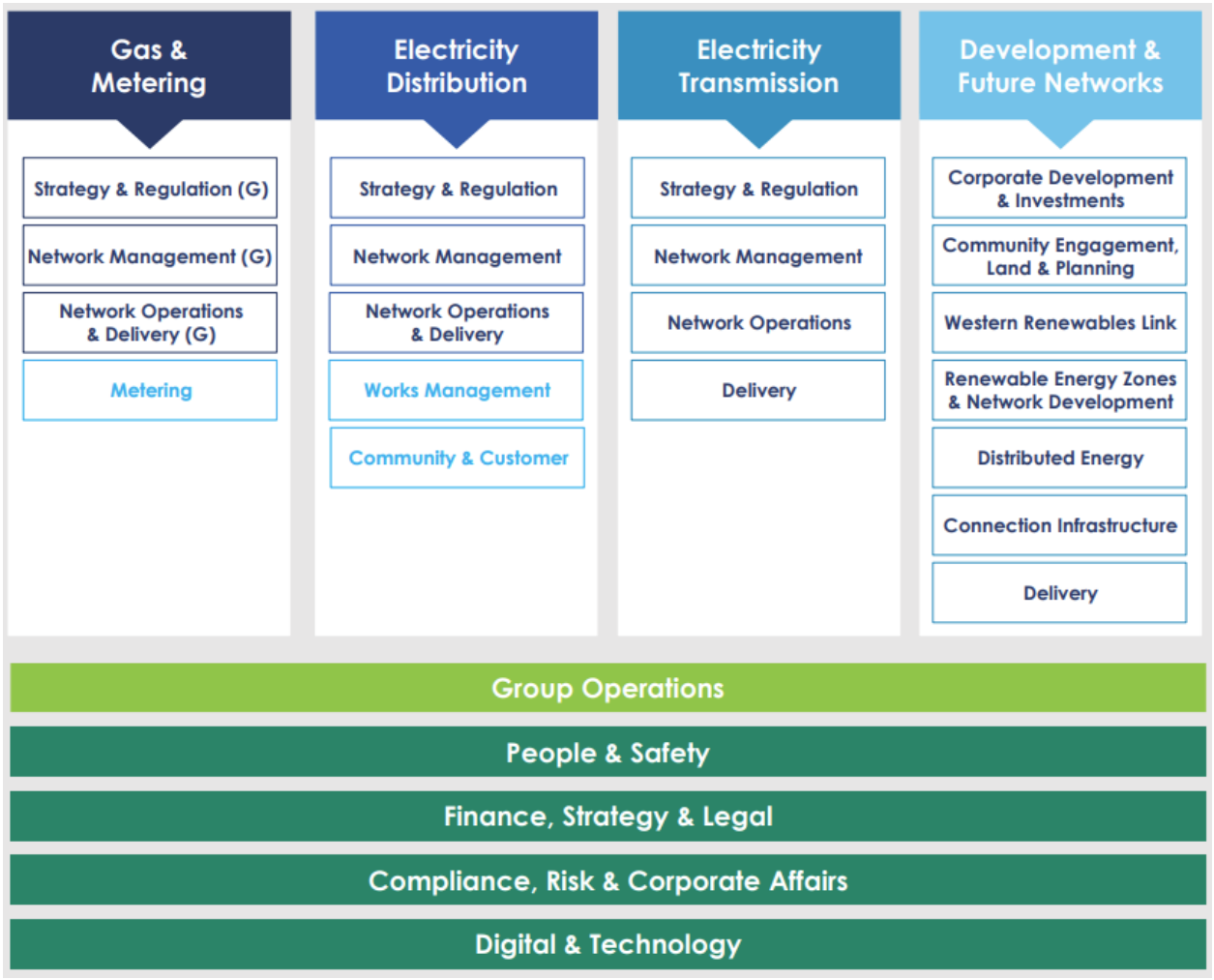

Figure 4 – AusNet's operating model

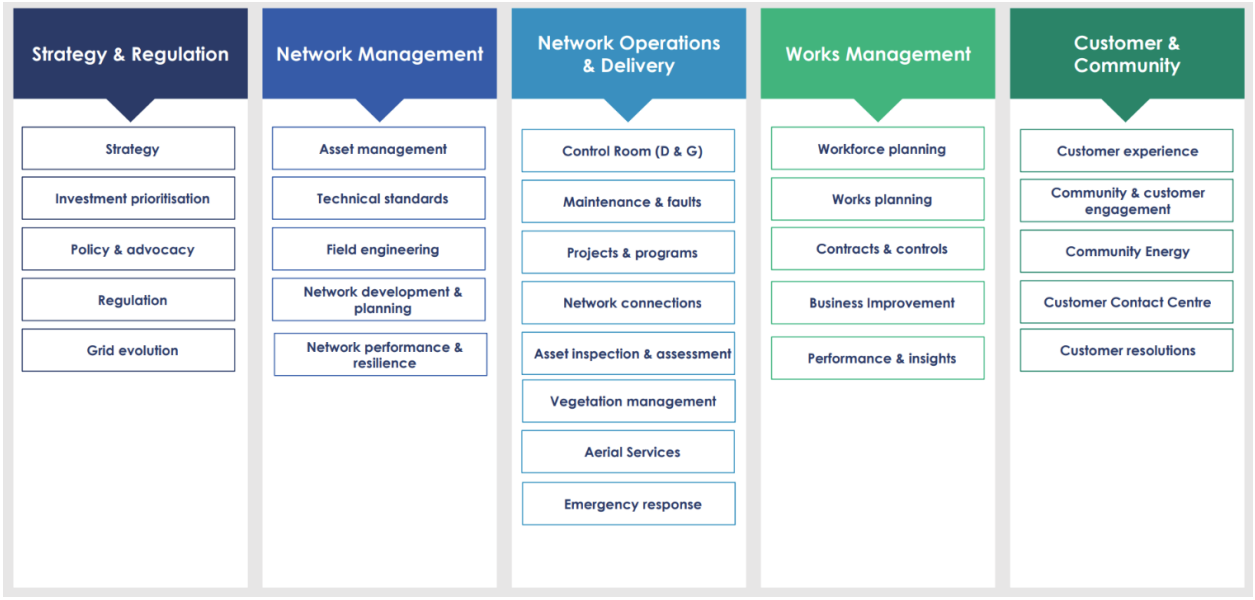

Figure 5 – Distribution line of business accountabilities

4.7. Network Strategy

Aligned to the line of business operating model, AusNet developed a network strategy for its electricity distribution business. AusNet's electricity distribution network will look very different in the future as Victoria and Australia decarbonise which will uplift electricity demand and transform the network to manage and integrate an increasing number of small and large renewable energy sources.

AusNet's distribution network will play a critical role to enable Victoria's energy future and is at the heart of the energy system in the state. AusNet's Electricity Distribution Network Strategy, outlines priorities to enable customer, network and energy system outcomes. It also outlines critical focus areas for AusNet to accelerate its efforts to support decarbonisation and those of the customers, communities and stakeholders it serves.

With Victoria targeting net zero emissions by 2045, five years earlier than national plans, AusNet has prepared an investment program to address emerging priorities and build the energy infrastructure for ambitious renewable generation and electrification jurisdictional goals. This program reflects the distribution network's role in supporting decarbonisation of both the energy and transport sectors and the priorities of customers, communities and stakeholders. The Network Strategy has been heavily shaped by customers, through an industry leading customer research and engagement program, which underpins AusNet's understanding of customer behaviour, needs and expectations and how it expects these to evolve throughout the energy transition.

Victoria is the fastest growing state in Australia with the population expected to reach 10.3 million by 2051 and much of this will be in the greater Melbourne and regional areas of the state, including within AusNet's distribution network.

Eight investment themes characterise the Network Strategy and these are shown in Figure 6. These investment themes reflect AusNet's critical role to deliver safe, affordable and reliable energy, which remains its core business. AusNet is also responding to mandates, policies and targets to enable load growth and electrification, renewable generation integration and to enable increasing levels of customer energy resources.

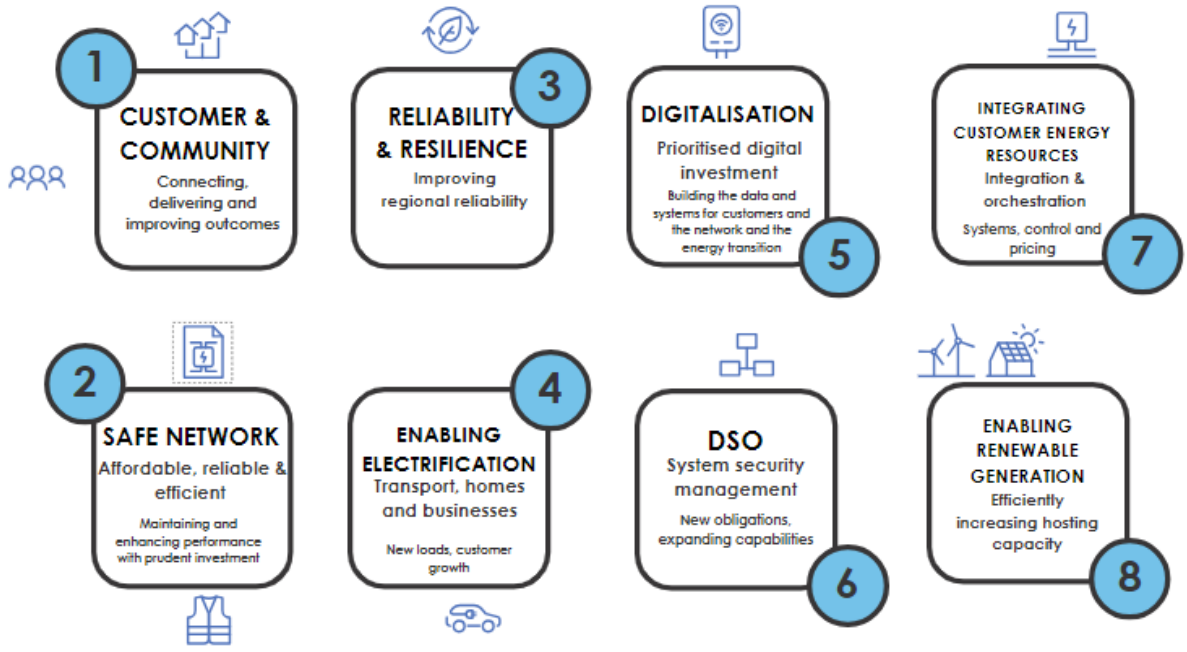

Figure 6 - AusNet's electricity distribution network strategy and investment themes

AusNet is also positioning itself as a critical enabler of broader Victorian energy transition goals and has committed to advocating constructively for regulatory and policy reform that will enable investment aligned to customer needs now and into the future.

In relation to traditional network investment, it is essential for AusNet to replace assets in a timely manner to avoid the consequences of in-service failure, which may expose the public and field personnel to safety risks and cause supply interruptions and potential damage to assets. AusNet's investment plans for the 2026-31 regulatory period reflect the impact of our aging asset base, which results in deteriorating asset condition, and increases in the costs of replacing assets.

As a result of the increasing frequency and severity of extreme weather and customer feedback, AusNet is proposing new resilience expenditure to prudently address the increasing frequency and magnitude of extreme weather events

leading to prolonged power outages. This resilience expenditure strikes a balance between 'prevent and prepare' and 'respond and recover' initiatives in a coordinated and holistic manner to deliver the best outcome for customers. Both approaches are essential because it is not possible to prevent all outages and therefore fully displace the need for timely response and recovery. Conversely, allowing for unrestricted growth in outages and diverting all resources to response and recovery would not be an optimal outcome for customers either.

4.8. Asset Management Objectives

AMS 01-01 provides an overview of the AMS. It includes Asset Management Objectives which align with the corporate objectives and focus areas. The objectives are supported by network specific objectives. The electricity distribution network asset management objectives are detailed in Section 8. of this strategy.

4.9. Safety Vision – missionZero

AusNet's safety vision is symbolised by the simple expression 'missionZero.'

4.9.1. Why missionZero?

AusNet never compromises on safety and it genuinely cares for the wellbeing of people, our customers and the environment.

It is this mindset that drives us to ensure there are no negative impacts on our families and communities as a result of our business operations.

To achieve its safety vision, AusNet mission is to work together to implement a common strategy with unified purpose and consistency of attitude.

AusNet cares for its people, customers and the environment and believe that they should be in a better state at the end of the day than when they started it. AusNet has a relentless pursuit for keeping its people safe and achieving the missionZero strategy.

The missionZero approach is summarised in Figure 7.

Figure 7 – missionZero overview

4.9.2. About missionZero

AusNet's missionZero journey began in April 2011 when the senior leadership team committed to a program to ensure that everyone gets home from work safely. AusNet's missionZero program has been in place since then and it has led to a continuous improvement in its safety culture and injury rates. Despite this, feedback from across the business was that the missionZero program needed to update to also consider wellbeing of our people and other aspects.

As a result, in 2022, with input from representatives across AusNet, the missionZero program evolved to become a more holistic program encompassing Safety, Wellbeing and the Environment.

MissionZero will continue to evolve over time to meet our business, employee, community, and environmental needs as we progress on our journey towards achieving our missionZero Strategy.

5. AusNet Overview

AusNet is Victoria's largest diversified energy network business and connects communities with reliable, affordable and sustainable energy. With over $13 billion in assets, we operate three core regulated networks: electricity distribution, gas distribution and the state-wide electricity transmission network. We also have a portfolio of contracted energy infrastructure. Our commercial business Mondo provides a range of energy and technical services and solutions. We have a dedicated team of over 1,400 employees who serve around 1.6 million customers.

AusNet's owns and operates three regulated electricity and gas networks and a portfolio of contracted energy infrastructure. AusNet is owned by Australian Energy Holdings No 4 Pty Ltd.

Electricity Distribution Network

AusNet's distribution network feeds electricity to 802,000 customers across 80,000 square kilometres. This covers eastern and north-eastern Victoria, and in Melbourne's north and east, with 93% being in regional and rural areas. It consists of more than:

- 45,200 km of overhead powerlines;
- 15,660 km of underground cables;
- 418,400 power poles; and
- 90,000 streetlights.

Electricity Transmission Network

AusNet's transmission network spans 6,620 kilometres and transports power from where it's generated to Victoria's five distribution networks, and connects and supplies power to more than 6.6 million Victorians and also help connect power to New South Wales, South Australia and Tasmania.

Gas Distribution Network

AusNet is one of three gas distribution businesses in Victoria. Its network covers 12,587 km, in an area of 60,000 square kilometres. The network includes:

- mains;
- mainline valves;
- pressure regulating facilities (including city gates, field and district regulators);
- service pipes; and
- meters and ancillary equipment.

AusNet distributes gas to 792,000 residential, industrial, and commercial customers in western Melbourne, Geelong and parts of western Victoria.

5.1. Distribution Network Overview

AusNet's electricity distribution network is in the eastern half of Victoria primarily serving outer metropolitan and regional customers.

The electricity distribution network comprises a 'sub-transmission' network constructed as overhead line and operating at 66kV and a 'distribution' network of overhead lines and underground cables, which includes a range of operating voltages, including 22kV, 12.7kV, 11kV and 6.6kV, as well as 240/415V and 240/480V.

The sub-transmission network is supplied from the Extra High Voltage (500kV, 330kV, 220kV) transmission network at 11 terminal stations (connection points). It consists of 2,500 km of 66kV lines made up more than 100 individual circuits. These are predominantly configured as loops back to the terminal station to maximise reliability. The sub-transmission network supplies electricity to zone substations which transform the voltage for distribution in the surrounding area.

The 22kV distribution network is currently supplied by 57 zone and switching stations, which are strategically located close to regional load centres. Additionally, three terminal stations also supply 22kV distribution feeders. Three 22/6.6kV zone substations supply the Mount Dandenong area via three 6.6kV feeders. The Latrobe Valley power stations and mines are supplied via five dedicated zone substations operating at 11kV and 6.6kV.

A typical network configuration is illustrated in Figure 8.

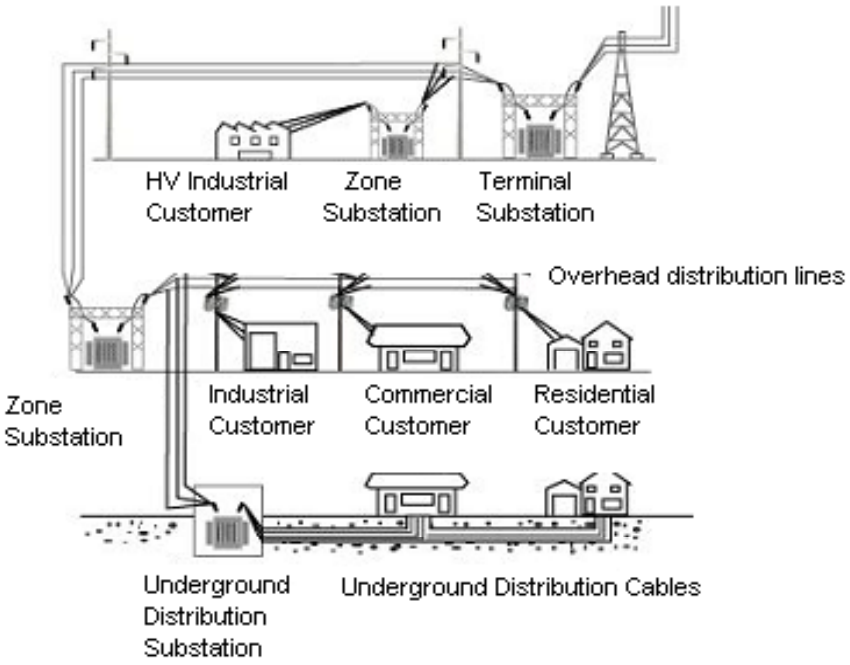

Figure 8: Typical Distribution Network Configuration

5.2. Locality and Geography

The AusNet's electricity distribution network serves the fringe of the northern and eastern Melbourne metropolitan area and the eastern half of rural Victoria as shown in Figure 9.

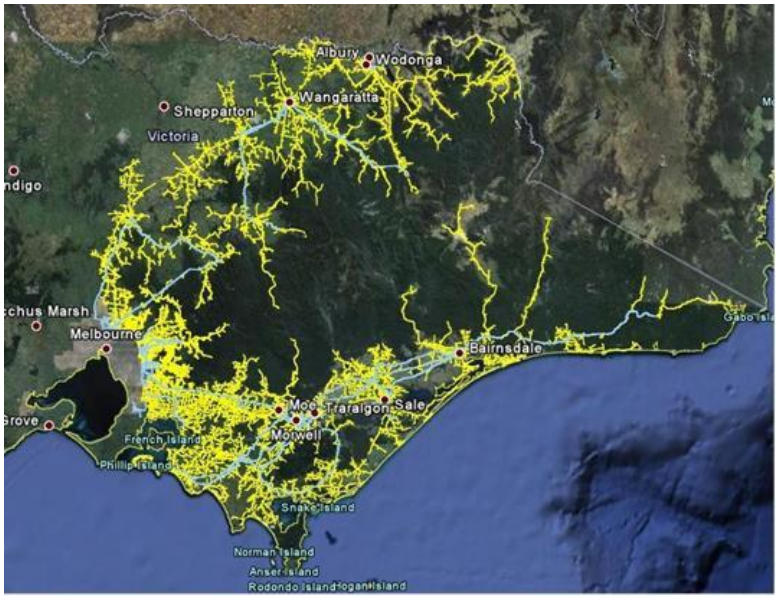

Figure 9: AusNet's Distribution Supply Area

Whilst approximately one third of the customer base is urban, the majority of network line length is in rural areas.

Much of the area is defined as Hazardous Bushfire Risk Area (HBRA), under Section 80 of the Electricity Safety Act. Assets within the HBRA are defined under the Electricity Safety (Bushfire Mitigation) Regulations as 'at risk supply networks'.

Approximately 200,000 poles are in HBRA. AusNet's distribution network also contains Melbourne's fast developing northern and south-eastern urban growth corridors.

5.3. Asset Summary

Table 2 summarises the volumes, of major assets in the network as reported to the AER.

Table 2: Distribution Network Assets

#	ASSET TYPE	DESCRIPTION	NUMBER
1	Connection Points	Terminal Stations (66kV Connection Point)[5]	11
2	Connection Points	Terminal Stations (22kV Connection Point)[5]	2
3	Connection Points	Terminal Stations (11kV Connection Point)[5]	1
4	Connection Points	Zone Substations (66/22kV)[5]	58
5	Connection Points	Substations (22/6.6kV)[5]	3
6	Connection Points	Zone Substations (Single Customer)[5]	9
7	Connection Points	Switching Station[5]	1
8	Transformers	Zone Substations Transformers[6]	140
9	Transformers	Distribution Transformers (Pole Mounted)[6]	57,398
10	Transformers	Distribution Transformers (Kiosk, Ground Outdoor or Indoor Chamber Mounted)[6]	5,432
11	Circuit Breakers	High Voltage (>22kV)[6]	188
12	Circuit Breakers	Medium Voltage (≤22kV)[6]	2,585
13	Feeders	Number of 22kV feeders[5]	350
14	Feeders	Number of 11kV feeders[5]	2
15	Feeders	Number of 6.6kV feeders[5]	10
16	Conductors	Overhead (Low Voltage <1kV) (km)[6]	6,590
17	Conductors	Overhead (SWER) (km)[6]	6,418
18	Conductors	Overhead (Medium Voltage 11 and 22kV) (km)[6]	22,542
19	Conductors	Overhead (High Voltage 66kV) (km)[6]	2,485
20	Conductors	Underground (Low Voltage <1kV) (km)[6]	5,302
21	Conductors	Underground (Medium Voltage 11 and 22kV) (km)[6]	2,625
22	Conductors	Underground (High Voltage 66kV) (km)[6]	13
23	Conductors	Service Lines (number of services)[6]	196,592
24	Poles	Wood Poles[6]	202,236

[5] AusNet Services Distribution Annual Planning Report 2024-2028
[6] AusNet Services Regulatory Information Notice – Category Analysis 2023

25	Poles	Concrete Poles[7]	129,882
26	Poles	Steel Poles (excluding public lighting poles)[7]	386
27	Poles	Public Lighting Poles[7]	99,277
28	Poles	Crossarms[7]	404,973
29	Communications	Optical fibre Cable (OPGW, ADSS, Underground)[8]	678
30	Communications	Point to point radio (ZSS)	22
31	Communications	Point to point radio links – AMI	8
32	Communications	WiMAX base stations	20
33	Communications	TRIO base stations	32
34	Communications	Network Technologies (PDH, SDH, WDM and TPS)	235
35	Communications	Routers, Switches and Serial servers	183
36	Communications	Telephone exchanges	9

[7] AusNet Services Regulatory Information Notice – Economic Benchmarking 2023
[8] Sourced from Communication team

6. Asset Management System

AusNet maintains an Asset Management System aligned to ISO 55001, the international standard for Asset Management. Adoption of this standard enables AusNet to achieve its objectives through effective and efficient management of its assets.

Compliance with ISO 55001 requires the demonstration of robust and transparent asset management policies, processes, procedures, practices and a sustainable performance framework. Accreditation is recognised as an indicator of best practice in asset management. AusNet is committed to maintaining an ISO 55001 certified asset management system that covers all AusNet's network assets.

AMS 01-01 Asset Management System Overview provides an overview of the AMS. Figure 1 also shows how the various components of the system interact with each other.

A key component of the AMS is the Asset Management Policy which acknowledges the company's purpose and directs the content and implementation of strategies, objectives and plans for the energy delivery networks:

AMS 01-02 Asset Management Policy

The Asset Management Policy summarises AusNet's fundamental asset management principles and from this overarching asset management objectives have been developed to support the successful delivery of AusNet's purpose. This Policy sets the foundation for all asset management decisions such as establishing and maintaining and ISO 55001 asset management system. It has been formally endorsed and communicated throughout the business.

7. Asset Management Drivers

The following sections discuss the significant drivers for future network investment to achieve customer, regulatory and shareholder expectations. AusNet is accountable for responding to these drivers in accordance with legislative and other regulatory instruments and to meet the needs of its customers.

7.1. Network Safety

Stakeholders and AusNet alike have high network safety expectations. Safety is one of the factors to be balanced in pursuance of the National Electricity Objective and network management is subject to the requirements of Victorian Safety Legislation.

The Safety Legislation requires network businesses to lodge an Electricity Safety Management Scheme (ESMS) and Bushfire Mitigation and Vegetation Management Plans with ESV. In particular, the strategies described in these regulatory commitments address the risks of electric shock and wildfire ignition associated with failures of distribution network assets.

Managing safety risks in accordance with the requirements of the Electricity Safety Act is consistent with the objectives of the National Electricity Rules. ESV has accepted AusNet's ESMS and its annual Bushfire Mitigation Plan.

> *The Electricity Safety Act (section 83B or Part 10) requires AusNet to minimise safety risks 'as far as practicable'.*
>
> *The Electricity Safety Act 1998 (Victoria), Part 1 – Preliminaries, Section 3 Definitions states:*
>
> *'practicable', in section 83B or Part 10, means practicable having regard to –*
>
> *(a) severity of the hazard or risk in question;*
>
> *(b) state of knowledge about the hazard or risk and any ways of removing or mitigating the hazard or risk;*
>
> *(c) availability and suitability of ways to remove or mitigate the hazard or risk; and*
>
> *(d) cost of removing or mitigating the hazard or risk.*

In practice, this means that the costs associated with managing safety risks shall not be grossly disproportionate to the benefits.

7.2. Bushfire F-Factor Scheme

The Victorian Governor in Council made the Order in Council for the F-Factor Scheme Order 2016 under section 16C of the National Electricity (Victoria) Act 2005. This was gazetted on 22 December 2016. On 20 July 2023, the Victorian Government gazetted the F-Factor Scheme Amendment Order 2023 that brought into effect changes to the calculation of Ignition Risk Units resulting from the move to the new Australian Fire Danger Rating System (AFDRS). Before the move to AFDRS, fire danger was predicted on a six-point scale from low to moderate to Code Red , whereas the AFDRS uses a four-point scale. The move to the AFDRS required changes to the weightings of the danger multipliers in the F-Factor Scheme Order and hindcasting of the DNSPs' fire histories based on the AFDRS to derive these weightings and set targets under the F-Factor Scheme.

In late 2022, the Department of Energy, Environment and Climate Action (DEECA) undertook consultation with the DNSPs, the AER and Energy Safe on the proposed changes to the F-Factor Scheme Order. This included provision of a discussion paper on the proposed changes and a report from CSIRO detailing the methodology used to derive the proposed weightings for the danger multipliers used in the Order.

The "F-Factor" scheme provides an incentive to Distribution Businesses to reduce the number of asset failures causing fire ignitions.

In the scheme, weights are applied to fires based on:

- the location of ignition (geography multiplier); and

- the prevailing fire danger rating in the relevant fire district in which the ignition occurred at the time the ignition occurred (time multiplier).

This combination of geography and time are used to calculate the ignition risk unit (IRU) with $15,000 allocated to each IRU under/over the target.

Table 3 gives the IRU targets as published in the Victorian Government Gazette and AusNet's performance. The table shows that AusNet's performance has been consistently below the regulatory targets over the period shown.

Table 3: IRU Targets

MEASURE	FY2016/ 2017	FY2017/ 2018	FY2018/ 2019	FY2019/ 2020	FY2020/ 2021	FY2021/ 2022	FY2022/ 2023	FY2023/ 2024
F-Factor – IRU Target	247.7	247.7	247.7	221.1	177.5	164.3	149.7 (Note 1)	131.7 (Note 2)
F-Factor performance	148.7	226.6	220.8	200.9	97.9	145.7	128.3	133.5

Notes:

1. The IRU targets for relevant financial years after the 2019/2020 financial year may be published by the Minister by notice in the Victoria Government Gazette. If the Minister does not publish the IRU target for a relevant financial year, the IRU target for that financial year is the same as the IRU target for the 2019/2020 financial year. The value for FY 2022/2023 was released in the gazette on 24 June 2021.

2. *The IRU target tor the current 2024-25 Australian Financial Year is 127.0 IRU*

7.3. Reliability Expectations

7.3.1. Service Target Performance Incentive Scheme (STPIS) and customer expectations

STPIS is the principal regulatory control for maintaining and improving network reliability. The scheme seeks to ensure that the incentives are sufficient to offset any financial incentives the distributor may have to reduce costs at the expense of service levels, also having regard to customer's willingness to pay for improved performance.

AusNet's consumer engagement has indicated significant concern for those customers that experience lower than average reliability levels either because they are served by unreliable feeders or are in regions with poor reliability.

In line with this strong feedback, AusNet is proposing a reliability investment program to the AER in its 2026-31 regulatory proposal, including for worst served customers which includes uplifting reliability on the top 10 worst served feeders and including a new express feeder in the Benalla area.

AusNet's network reliability targets for the regulatory control period are established by the AER. As per Clause S6.1.3(4) of the NER, AusNet's targets for 2021-2026 are shown in Table 4. The AER will determine updated targets for the 2026-31 regulatory period in April 2026.

The incentive scheme rates are calculated as per Clause 3.2 of the STPIS.

Table 4: 2021-2026 Reliability Targets

PERFORMANCE TARGETS	PERIOD	URBAN FEEDER	RURAL SHORT FEEDER	RURAL LONG FEEDER
USAIDI (average minutes) – Note 1	2021-2026	87.190	195.160	293.692

USAIFI (average interruptions) – Note 2	2021-2026	0.891	2.007	2.628
MAIFI (average interruptions) – Notes 3 and 4	2021-2026	2.817	5.657	9.920

Notes:

(1) USAIDI (Unplanned System Average Interruption Duration Index, or the average minutes a customer is off supply each year as a result of unplanned outages).

(2) USAIFI (Unplanned System Average Interruption Frequency Index, or the average number of times each year a customer is off supply for more than three minutes as a result of unplanned outages).

(3) MAIFI (Momentary Average Interruption Frequency Index or the average number of times each year a customer is off supply for less than or equal to three minutes).

(4) Call centre performance (the percentage of fault calls progressing to an operator that are answered within 30 seconds).

The incentive has delivered highly material economic impacts and ensures a critical focus on network reliability. The incentive scheme impacts are accordingly a key input into the development of asset strategies and the economic evaluation of investment options.

Features of the STPIS include:

- Symmetrical penalties and rewards;
- Measured primarily on the basis of performance deviation from target;
- Targets are set prior to each regulatory control period based on historic performance with adjustments for planned improvements;
- Incentive rates based on customers willingness to pay as represented by Value of Customer Reliability (VCR);
- Exclusions based on statistical outliers from long run performance;
- Removal of accumulation or roll forward of incentives; and
- An S-Bank facility to smooth pricing impacts on customers.

There are two key features of the STPIS that limit its effectiveness at encouraging networks to improve reliability for all customers:

- **Both targets and actual performance metrics exclude Major Event Days** (MEDs) as the incentive scheme is aimed at improving reliability under normal conditions and not during MEDs which are less predictable and less frequent.
- **Both targets and actual performance metrics are highly averaged**. For example, AusNet's performance on rural long feeders is measured as an average across all feeders of that type. Accordingly, outages affecting a very small number of customers do not affect network averages and, therefore, our STPIS outcomes.

As a result of these design features:

- Investments that mitigate the effects of extreme weather on customers are not encouraged; and
- Reliability improvements are encouraged in areas with higher customer density (i.e. as they will improve STPIS performance), and less encouraged in areas with relatively low customer densities.

As discussed in section 10.12. , recognising these issues, AusNet's 2026-31 Regulatory Proposal includes several projects and programs to improve reliability and resilience.

7.3.2. Guaranteed Service Level (GSL)

The STPIS also incorporates a Guaranteed Service Level (GSL) scheme, which provides an incentive for distributors to improve service to customers receiving poor service and recognises by way of payment those customers who have received poor service.

Features include:

- Funding included in determination;
- Parameters, threshold and payments based on jurisdictional arrangements;
- Uncapped liabilities; and
- S-Factor exclusion methodology applies.

The ESC has introduced a new GSL scheme in Victoria from the 1 July 2021. These are outlines in Table 5 below.

Table 5: GSL Supply Restoration and Low Reliability Payments from July 2021 onwards

Guaranteed Service Levels

If you experience...	We will pay you
More than 12 hours unplanned sustained interruption on a Major Event Day*.	$90
*A 'major event day' is an industry term used to indicate abnormal performance in supply reliability due to events outside of control of the distributor such as extreme weather and storms.	
More than 18 hours of unplanned sustained interruptions (longer than three minutes) in a financial year	$130
More than 30 hours of unplanned sustained interruptions (longer than three minutes) in a financial year	$190
More than 60 hours of unplanned sustained interruptions (longer than three minutes) in a financial year	$380
More than 8 unplanned sustained interruptions (longer than three minutes) in a financial year	$130
More than 12 unplanned sustained interruptions (longer than three minutes) in a financial year	$190
More than 20 unplanned sustained interruptions (longer than three minutes) in a financial year	$380
More than 24 momentary interruptions in a financial year	$40
More than 36 momentary interruptions in a financial year	$50
If you report a faulty streetlight and it is adjacent to your property or business, and we are responsible for it, then we will repair the light within two working days. If we do not fix the light within this period, we will pay you $25	$25
We will pay you $35 if we are more than 15 minutes late for an appointment*	$35
We will pay you $80 per day up to a maximum of $400 if we do not supply electricity to your supply address on the day we agreed with you	$80

7.3.3. Value of Customer Reliability (VCR)

The Value of Customer Reliability (VCR) represents, in dollar terms, the willingness of customers to pay for a reliable supply of electricity.

In response to a Rule Change proposal from the Council of Australian Governments (COAG), the AEMC amended the NER to give the AER responsibility of determining the values different customers place on having a reliable supply. This rule change became effective on 5 July 2018. In December 2019 the AER released their final report on the VCR setting out values for unplanned outages of up to 12 hours in duration.

The AER updated the 2022 Values of Customer Reliability (VCR) values to 2023 values based on the Consumer Price Index (CPI) increase. The annual adjustment mechanism is based on yearly movements in the September quarter CPI. The VCR values and methodology have been reviewed and updated values were published in December 2024[9].

The current VCR estimation approach presents two key issues for reliability investment:

- **VCRs are highly averaged across different residential and business customer types** and, therefore, may not be reflective of the value placed by individual customers or communities on different locations across the network (which may vary considerably). For network planning purposes, AusNet develops weighted VCRs based on the mix of customer types within each zone substation area. These VCRs are used to economically assess projects within the relevant area of our network. While this approach takes account of differences in customer types across AusNet's network, it is reliant on highly aggregated / averaged VCR inputs for each customer segment and, therefore, does not take account of location specific differences in the value placed on reliability.
- **VCRs reflect only the value placed on avoiding 'standard' outages of less than 12 hours** and, therefore, exclude the value placed on longer outages, including Wide Area, Long Duration Outages (WALDO). To address this issue, the AER has recently estimated a Value of Network Resilience (based on a multiplier of the existing VCR) and is progressing other work to estimate the value placed on avoiding WALDOs.

AusNet has recently undertaken a significant research study to develop its own AusNet-specific VCR values which, for residential customers, are substantially higher than previous AER VCRs and broadly in line with the AER's updated VCRs published in December 2024. Where appropriate, AusNet has applied its VCR values to develop the network investment plans for the 2026-31 regulatory period and will consider the implications of the latest AER VCR values in its Revised Proposal which will be submitted in late 2025.

7.4. Rapid Earth Fault Current Limiters (REFCLs)

The 2009 Victorian Bushfire Royal Commission (VBRC) provided a range of recommendations relating to distribution networks, which are addressed within the Bushfire Mitigation Plan. Recommendations that required further investigation and analysis due to technical complexities were addressed by the Powerlines Bushfire Safety Taskforce (PBST) and their recommendations subsequently accepted by the Victorian Government. Recommendations 28 and 29 were implemented through changes to the Electricity Safety (Bushfire Mitigation) Regulations 2003. Outcomes of the PBST are defined in *AMS 20-13 Enhanced Network Safety Strategy*.

Recommendation 27 of the VBRC called for new technology that delivered greatly reduced bushfire risk, being applied to all overhead conductors (SWER and 22kV powerlines) in high bushfire risk areas.

The Government subsequently introduced Electricity Safety (Bushfire Mitigation) Amendment Regulations 2016 that require each polyphase line originating from selected zone substations to have specific capacity to reduce voltage and therefore limit the potential for fire ignition.

This has resulted in the introduction of the REFCL program as described earlier in this document and the final map of constructed sites in Figure 10.

[9] See Values of customer reliability - final report

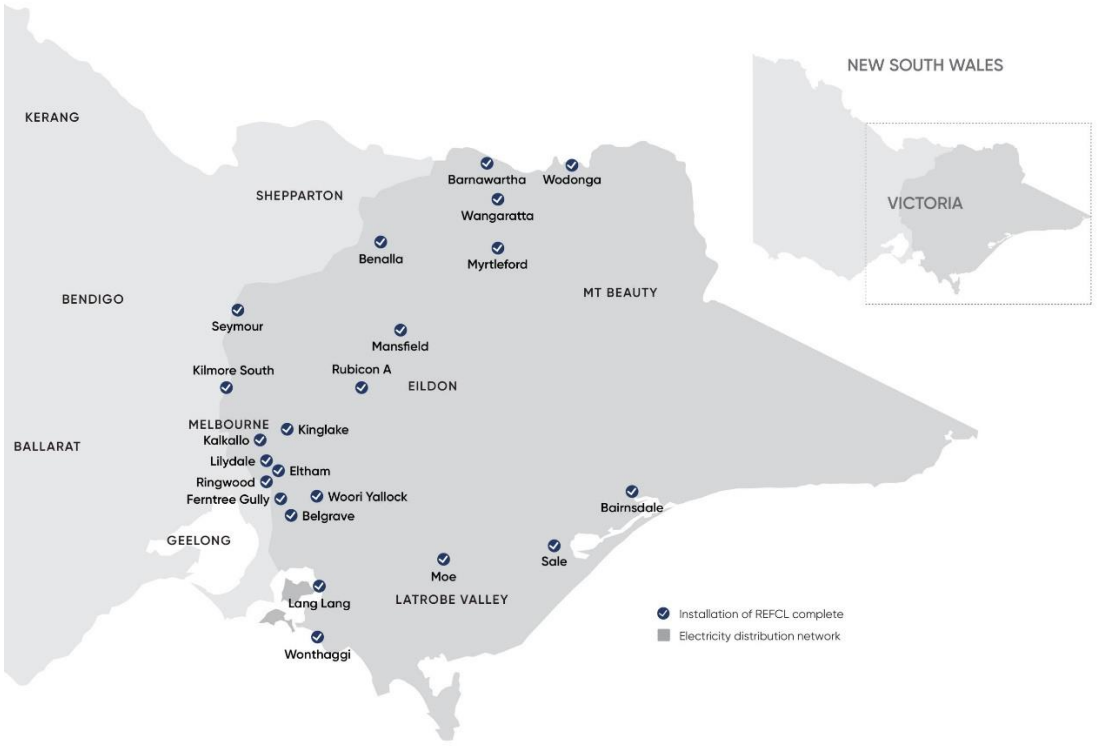

Figure 10: Map of REFCL sites

7.5. Customers

In preparing for its 2026-31 regulatory proposal, AusNet conducted extensive research to understand its customers' future needs and expectations of AusNet as well as perceptions of its current performance. The energy transition has featured prominently, and customers expect AusNet to keep pace with and be ready to deliver to their evolving needs and preferences.

There is a marked difference in customers' expectations compared to five years ago, with strong key themes emerging. Figure 11 summarises these themes, which have emerged through surveys, workshops and engagement through customer panels.

Figure 11: AusNet customer expectations and their evolution

AusNet also collaborated on a network aspiration with its customer panels in early 2023 to guide the development of our 2026-31 Plan. This aspiration has guided the development of its plan, which aims to meet the three pillars as shown in Figure 12.

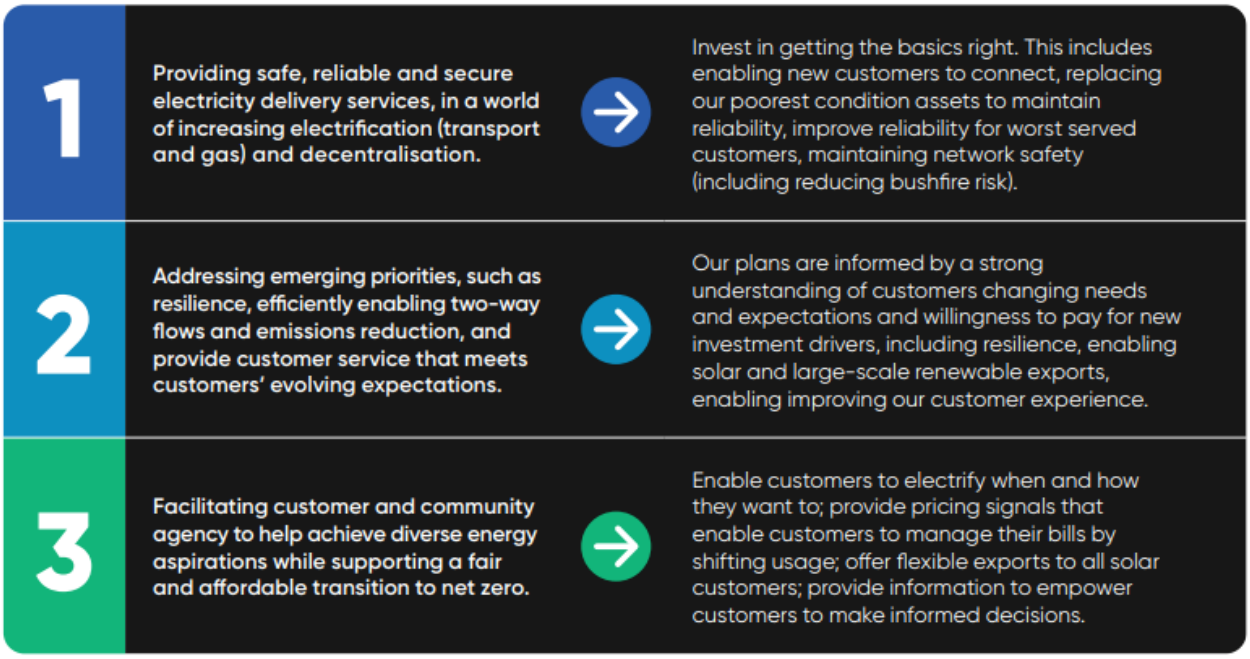

Figure 12: AusNet network aspiration

7.6. Network Demand and Utilisation

Ongoing network augmentation investment and significant expansion of the network in targeted urban growth corridors has managed strong demand growth over many years. The majority of new customers are connected via underground reticulation in residential estates located in the south-eastern and northern growth corridors of metropolitan Melbourne.

The expected growth in solar photovoltaic (PV) arrays is expected to continue. Technological advances in PV arrays are continuously increasing in efficiency and installation cost effectiveness although generation is ultimately offset by reduced capacity over time due to wear-out.

The key drivers of demand growth are continued growth in customer numbers as well as electrification of gas and transport. Electrification of gas is the key contributor to the changing peak from summer to winter, as households switch to electric heating. Approximately 7% of the winter peak is expected to come from the electrification of gas, while the electrification of transport is expected to contribute approximately 4.5% to maximum demand across the year.

Rooftop solar generation tends to reduce maximum demand impacts in the summer; however, in the winter, rooftop solar generation is insufficient to dampen winter maximum demand, which is another contributing factor to faster growth in winter peaks despite the growing penetration of rooftop solar over time.

AusNet has the fourth highest utilisation rate in the NEM, with other Victorian distributors also having high utilisation comparison to other jurisdictions. This is because Victorian distributors have historically used 'probabilistic' planning for network augmentation, rather than a more deterministic approach used in other jurisdictions.

However, even if utilisation grows, growth in demand will lead to the need for more capacity.

High asset utilisation is fundamentally a desirable characteristic as it represents more efficient use of available capacity. However, this must be balanced against key risks:

- Accelerated deterioration of electrical insulation caused by elevated operating temperatures;
- Reliability of service affected by complex operating procedures to re-distribute peak loadings, de-energise equipment and maintain supply security during periods of high demand or network faults;
- The need to establish sophisticated, case specific, contingency plans to minimise customer load-at-risk;

- A heightened reliance on frequent and sophisticated condition monitoring and maintenance to ensure loading conditions are not impacting design parameters or causing rapid deterioration of the plant; and
- Reduced flexibility to access equipment for maintenance, repair or switching.

The risks have associated commercial risks for AusNet which must also be considered, such as:

- Compromised network reliability performance and subsequent STPIS revenue penalties;
- Increased operating and capital cost associated with reduced flexibility to access network assets for maintenance; and
- Requirement for increased strategic spares, particularly high-cost items such as transformers, to mitigate the risks of plant failure.

More detailed information on utilisation and its impacts is contained in *AMS 20-12 Augmentation*.

7.7. Quality of Supply Requirements

Through our engagement with customers, they have made clear that they value not just availability but also power quality. This is especially important for large industrial customers.

AMS 20-15 Quality of Supply describes the challenges faced and the initiatives taken by AusNet to manage supply quality to the requirements of the Electricity Distribution Code.

Over recent regulatory control periods, the importance of power quality has been recognised by regulators and Distribution Businesses have responded through the installation of monitoring equipment at zone substations and at feeder extremities.

- Power quality is measured by several means including:
- Power quality meters installed at zone substations and
- Power quality meters installed at the extremity of one distribution feeder emanating from each zone substation,
- Temporary installation of sophisticated power quality meters to investigate specific issues, and
- AusNet Advanced Metering Infrastructure (AMI) meters have the capability to measure steady state voltages at the customers' point of connections in 5-minute intervals.

Analysis of power quality data from zone substations and feeder extremities when combined with the customer AMI data and monitoring of customer complaints indicates that portions of the distribution network have power quality issues.

These include:

- Steady state voltage variations;
- Voltage sags and swells;
- Negative sequence voltages outside the requirements of the Distribution Code; and
- Harmonic distortion.

Investigations of the few complaints received about voltage harmonics or voltage flicker have revealed these issues were generated by equipment in customers' installations. These were resolved by the installation of mitigating equipment by the customers concerned.

7.7.1. Steady State Voltage Variations

Maintaining steady state voltages within the Distribution Code limits is a challenging task due to increased penetration of solar PV generations.

A national power quality survey has reported that the steady state voltages are closer to the upper limit of the allowable voltage range.

Analysis of customer voltages obtained from the AMI meter data indicates that the steady state voltages of some customers are outside the code requirements.

7.7.2. Voltage Sags and Swells

Voltage sags and swells are short duration deviations from steady state voltage levels. Voltage sags and swells can affect the operation of customers' equipment – dimmed lights are common.

Industrial customers can experience plant failure due to their protection systems operating incorrectly and causing financial loss to customers.

In extreme cases, voltage sags can damage equipment.

7.7.3. Negative Sequence Voltages Outside the Requirements of the Distribution Code

Some parts of the network also experience negative sequence voltage that is outside the Distribution Code limits. Mainly three phase customers are experiencing the negative sequence issue and it can cause equipment malfunctioning or damage.

The main causes for negative sequence voltage deterioration are load unbalance and network asymmetry in the sub-transmission network.

7.7.4. Harmonic Distortion

Another emerging power quality issue is the harmonic distortion caused by modern household equipment such as Compact Fluorescent Lamps.

7.7.5. Export enablement

Solar exports allow households to share their renewable generation with others, and they contribute to the government's renewable energy targets. However, exports at the customer site can also create challenges for the grid that was not historically designed for those types of injections of power, and management of 'two way flows'.

Traditionally, networks have either allowed customers to export excess energy to the size of their inverter (standard 'static' limit of 5kVA in Victoria) or have constrained them up to 0kVA export capacity in areas where the network is experiencing constraints and challenges from high exports. As solar penetration continues to grow, the instances of 0kVA export constraints are growing, which has a negative impact on the customers installing solar but also limits the value that can be extracted from this renewable energy source.

Through customer research, surveying and workshops, AusNet has received consistent feedback that solar energy should not be wasted and that solar exports should be celebrated, both as renewable energy resources but also to allow neighbours to share in that energy. AusNet continues to invest to unlock export capacity through a combination of a roll-out of a Dynamic Voltage Management System (DVMS), local distribution substation upgrades and ICT investment to enable Flexible Exports. Flexible Exports services will be offered from 1 July 2026 as default, replacing use of static export limits.

7.7.6. Solar emergency backstop

Occasionally on mild, sunny days when there is low demand for electricity, more solar is exported to the grid than we can use. This can lead to unstable electricity supply, local voltage issues and possible outages.

The solar emergency backstop is a mechanism that allows electricity distribution businesses like AusNet to remotely turn down or switch off rooftop solar systems during an energy supply emergency. This is only used as a last resort to avoid widespread power outages. This change has been mandated by the Victorian government.

The emergency backstop, mandated by the Victorian Government, has been designed to make sure that solar exports can be safely managed and enable more households to get the benefits and annual bill savings associated with solar. It will help to avoid blackouts by enabling rooftop solar systems to be turned down or switched off when there is too much power in the grid. Details of the requirements are outlined in Figure 13.

Figure 13: Victorian solar emergency backstop arrangements

Using the emergency backstop is a last resort. The emergency backstop will only be used when required by the Australian Electricity Market Operator (AEMO) and only for as long as it is needed, in rare emergencies when solar exports are too high to be safely managed. It will help to avoid blackouts and make sure that Victorians can continue to use electricity.

This new requirement for AusNet's electricity distribution business highlights how it is playing an increasingly important role to supply energy to customers and enable renewable generation connected to its network.

7.8. Network Support Services

Network Support Services refer to the suite of non-network solutions and demand management techniques available for procurement by AusNet to manage risk and improve the performance of the distribution network.

Such services can include embedded generation, embedded storage, tariff strategies and customer demand response.

7.8.1. Customer Energy Resources (CER)

Customer Energy Resources (CER) refers to embedded generation (EG) that is distributed throughout the electricity network and connected at low voltages. Typically, solar, small wind generators and co-generation (heat and electricity) systems are deployed for local supply by homeowners and businesses for various reasons including in response to government incentives. Also included is the proposed strategy for Electric Vehicles as this is not only a charging load but also, potentially, a source of generation into the network.

In addition to supplying the local load, embedded generation (EG) has the potential to defer peak demand and shift load to another time. Demand Management (DM) services can use EG or load curtailment to control peak demand.

AusNet's 2026-31 regulatory proposal includes initiatives that will allow customers and the industry to unlock more value from CER, enabling a faster and efficient transition to Net Zero. These initiatives represent the evolving role of distribution networks into a role of the 'Distribution System Operator', as networks increasingly need to operate the distribution network more like a complex energy system with two-way flows and interactions with various technologies connected to the system. This is a significant change from the traditional role of networks as transporting electricity one-way from

remote large generation to distributed households and businesses. The transition from traditional network service provider to the role of the DSO is already underway in the United Kingdom with successful introduction of more flexibility in network services and customer participation.

7.8.2. Demand Side Management

AusNet provides network support services in the most efficient manner available. Where network support, by EG or demand management is the least cost, most efficient strategic option, AusNet will respond accordingly. AusNet also recognises the intent of the AER for transparency in network planning and augmentation as defined under the new rules for RIT-D.

RIT-D requires DNSPs to consider and assess all credible options before they choose the best investment option to meet their customer's needs. The application guidelines set out guidance on how to assess these options and the circumstances in which businesses are required to consider and quantify market benefits when undertaking a RIT-D[10].

7.8.3. Deferral of Augmentation

Many new energy supply technologies connect directly into the distribution network, either as dedicated export connections or via a regular electricity supply connection, as is the case for household installed photovoltaic arrays.

The resulting multi-directional energy flows and energy sharing role for the network will impact safety, network design and network operation in various ways, and need to be addressed in forward planning to facilitate accommodation. Some aspects requiring consideration are quality of supply implications on the distribution network, network support implications, metering arrangements and safe operating arrangements.

The provision of network support in the form of EG or the use of demand reduction during the relatively short periods of high network demand, has the ability to manage short term peak demand effectively.

Medium term deferral of augmentation can also be effective with the use of larger EG facilities and demand side participation (DSP).

7.9. Asset Information

AusNet's main asset management information systems are:

- SAP Enterprise Asset Management – Asset data information system;
- SAP Enterprise Resource Planning – Task, project and program information system for managing physical change in the network;
- SAP Work Manager – Field mobility solution;
- Spatial Data Management Electricity (SDMe) – Geospatial asset location and network modelling;
- Enablon – Incident, Risk, Compliance and Audit Management
- LatLonGo – Geospatial navigation system for viewing tasks, projects and programs in each network;
- Distribution Outage Management System (DOMS) - real time network configuration and status management system;
- PowerOn Fusion – Electricity distribution supply outage management system;
- Objective – Engineering drawing record management system;
- Enterprise Content Management (ECM) – Written document management system;
- Protection and Control Setting Information System (PACSIS) – Protection relay settings; and

[10] Regulatory investment test for distribution (RIT-D) and application guidelines (http://www.aer.gov.au/node/19146)

- DnA Information management platform

The key drivers of improvement in information systems are:

- Improving data quality for informed operation and strategic decision making;
- Increasing costs of supporting disparate, customised, non-interfaced systems;
- High risks associated with reliance on the 'local knowledge' of a mature-aged workforce;
- Repeatable, transparent and auditable processes to assure compliance to regulatory and safety obligations; and
- Replacement of obsolete legacy systems.

7.10. Asset Condition

The deterioration of network assets over time may affect worker and public safety, the environment and network performance and impact on the organisation achieving its objectives.

Asset condition is a measure of the health of an asset and is a key parameter in determining the remaining useful life and can be used to predict how long it will be before an asset needs to be repaired, reinforced, refurbished or replaced.

Asset condition is also an indicator of how well an asset can perform its designed function.

Health indices provide an estimate of asset condition help to provide an indicator for increasing volumes of replacement work that will occur due to deteriorating condition and serviceability.

In forecasting expenditure requirements, a sound understanding of the failure rates and replacement rates of deteriorating assets is necessary to ensure future replacement plans are consistent with sustained service performance.

Effective condition monitoring, analysis and management are essential. Accordingly, condition modelling and recognition of the advanced service age of many assets is a key consideration in the AMS.

Further information on condition monitoring can be found in *AMS 10-19 Plant and Equipment Maintenance*.

7.11. Sustainability

AusNet embraces its role in keeping the lights on for our customers and communities and it operates its businesses so that they each play a role in accelerating a sustainable future. In 2021, AusNet released its first Task Force on Climate-related Financial Disclosures (TCFD) report to assist stakeholders understand its approach to identifying and managing climate-related risks and opportunities. AusNet's second and most recent TCFD report was published in 2023[11]. AusNet has committed to an overall goal of net zero greenhouse gas (GHG) emissions by 2045 for our Scope 1 and 2 emissions and an interim target of 50 per cent reduction by 2030 relative to a 2022 baseline.

7.11.1. Emissions Management

Line losses represent almost the entire carbon footprint of the distribution network.

Whilst these losses are classified as Scope 2 emissions under the National Greenhouse and Energy Reporting Scheme (NGERS) classification, and therefore do not require the purchase of permits, AusNet's strategy is to propose efficient network augmentation in the form of distribution feeder re-conductoring and pole-top capacitor installation based upon the forecast cost of losses to customers.

[11] See Task Force on Climate-related Financial Disclosures (TCFD)

In addition, AusNet includes both electrical and environmental (i.e., SF6) costs in economic analysis of project options to ensure efficient network augmentation and asset renewal projects are proposed.

AusNet intends to achieve its interim target by focussing on these two emissions categories.

7.12. Compliance with Environmental Obligations

The regulatory instruments (including the NER and Distribution License) require AusNet to comply with all applicable regulatory obligations or requirements associated with the provision of network services. Environmental compliance, including the implementation of sustainable practices, is therefore a key objective for the AMS.

As part of its environmental system, AusNet continues to mitigate risks associated with asbestos containing materials, oil contaminations, CCA treated poles, greenhouse gas emissions and noise to address community and customer expectations. Electrical loss reduction and the capability of the electricity distribution network to interconnect distributed generation are emerging expenditure drivers.

The updated Environment Protection Act 2017 that came into effect on 1 July 2021 focuses on prevention by using risk-based systems to minimize risk to human health and the environment.

AusNet prepared for the new act by implementing 3 readiness action plans:

- General Environment Duty (GED)
- Land Contamination
- Environment Management System Enhancements

The HSE team manages the operational compliance with key environmental obligations.

7.13. People and Culture

The nature of the energy sector will change fundamentally over the next decade, responding to community expectations of safety and reliability, climatic change and emerging technologies. The systems, processes, tools and the appropriate employee skills set used to deliver distribution services will need to adapt to the changing operating environment as it continually evolves.

More immediately, the industry faces skill shortages through retirement of an aging workforce. The retirement profile, together with a projected increase in network expenditures, is driving the increasing demand for knowledge management, skills-transfer, training and recruitment.

Retaining and developing AusNet's people will be critical to the successful implementation of the wide range of asset management initiatives. Programs must be designed to promote behaviours and activities consistent with AusNet's core values.

7.14. Heightened Focus on Security

Commonwealth and state governments have imposed legal responsibility[12] on both the owners and operators of critical infrastructure (such as gas and electricity installations) to take all necessary preventative security measures to ensure continuity of supply.

[12] Victorian Terrorism (Community Protection) Act 2003

Legislation has been enacted to counteract the threat of terrorism or sabotage to critical infrastructure. The five main security threats to the electricity distribution network are:

(1) Safety – of untrained persons in the vicinity of energy-containing equipment;

(2) Malicious – motivated by revenge, fame, association or challenge;

(3) Criminal – profit driven; includes theft, fraud, sabotage or extortion;

(4) Terrorism – treat or use of force to influence government or public through fear or intimidation[13]; and

(5) Accidents or natural disasters that breach secure perimeters and/or cause security protections to fail.

Industry standards for security have also been established to reduce the risk of injury to children, or asset damage caused by vandals, following unauthorised access.

In addition, AusNet has sophisticated policies and procedures which provide clear instruction on the prevention of, and response to and recovery from security events. These internal standards reflect the advice and recommendations contained in various other agency and association documents providing guidance.

These instruments reflect the increasing priority of physical security as a critical component of asset management.

These include:

- SPIRACS
- AusNet's Information Security Policy
- Victorian Emergency Management Manual
- Emergency Management Act 1986 (VIC)
- Terrorism (Community Protection) Act 2003
- AusNet's Tactical Security Plans
- Victoria Police Precinct Mapping of AusNet's assets.
- ISO 31000:2009 Risk Management-Principles and Guidelines
- HB436-2004 Risk Management Guidelines
- HB167-2006 Security Risk Management
- Australian Government Department of Industry Tourism and Resources: Electricity Systems – Risk Context Statement, March 2007 (Electricity Systems Risk Context Statement (2007))
- Australian Government's (ASIO) Business Security Report July 2006 – Electricity
- Department of Infrastructure Risk Context Statement for Energy
- Critical Infrastructure Emergency Risk Management Assurance Handbook
- Victorian Framework for Critical Infrastructure Protection from Terrorism
- AusNet's Network Contingency Plans

7.15. Advances in Technology

The nature of the energy sector will continue to change fundamentally over the next decade, responding to community expectations of safety and reliability, climatic change and emerging technologies. Advances in

[13] A 'terrorist act' is an act or threat intended to advance a political, ideological or religious cause by coercing or intimidating an Australian or foreign government or the public; causing serious harm to people or property, creating a serious risk of health and safety to the public, disrupting trade, critical infrastructure or electronic systems - Criminal Code Act 1995 [Commonwealth]

technology are facilitating new electricity generation and storage techniques and more efficient small-scale embedded generation solutions, and in the future, the introduction of electric vehicles.

Integration of these new technologies presents new challenges and opportunities for the distribution network.

7.15.1. Innovation

Innovation is required to modernise the electricity distribution network and develop the most effective solutions for network challenges. It will explore the most economical way of maintaining reliability and safety of the network in the future. AusNet aims to keep innovation research focussed on resolving most urgent and important network problems and involve Victorian educational and research institutions.

AusNet has a strong track record of delivering innovation projects, from inception to scalability and projects that have been delivered during the 2021-26 regulatory period are show in in Figure 14. AusNet has again proposed an innovation fund for the 2026-31 regulatory period, which is an increase compared to the innovation funding approved by the AER for the 2021-26 regulatory period. AusNet is seeking more funding to help us address rapidly arising challenges from the current energy transition and in the goal to achieve Net Zero targets.

Seven innovation projects within the proposed fund fall into two key themes—smarter network management and new customer services and tariffs—all focused on delivering customer benefits such as increased network utilisation (and lower unit cost of electricity), lower network costs in the long term, and enabling customers to maximise the value they can achieve from their investments. AusNet's stakeholders and Innovation Advisory Committee (IAC) support its expanded innovation ambition.

The innovation fund is in addition to the proposed Demand Management Innovation Allowance Mechanism (DMIAM) funding, for which the AER sets the value. AusNet's proposed projects under the DMIAM scheme are focused on managing the increasing risk of peak demand during winter, largely driven by electrification.

Figure 14: AusNet innovation projects delivered since 2021 or currently underway

7.15.2. Proposed innovation projects

AusNet believes new technology offers a pathway to greater community resilience. Over the last two years, AusNet has been developing a clear vision and set of design principles on how to achieve this. AusNet's seven proposed strategic innovation projects that are expected to deliver significant customer benefits and are shown in Table 6.

The projects are all focused on unlocking potential benefits to customers from the current energy transition, driven by customers' strong take up of consumer energy resources (CER). As the energy transition progresses, AusNet expects customer experience and services will become increasingly complex and will evolve over time.

It is important that AusNet is able to test and research possible ways in which we evolve our services, tariffs and ways in which we operate, to ensure we continue to meet customer expectations and that we are able to operate in a way that improves efficiency. The innovation projects fall into two key themes:

- **Smarter network management**
    - These projects are seeking to develop new ways of monitoring our low voltage (LV) network, including better visibility of asset performance and customer behaviours, to help us develop granular and detailed network models that do not exist anywhere in Australia today.
    - This includes testing and better understanding different types of storage technologies, which all have different ways of providing network services such as voltage regulation. These initiatives are aimed at improving network utilisation and the efficiency of network operations over time, given we can demonstrate they add value and reduce long term costs for customers.
- **New customers services and tariffs**
    - These projects aim to test new services for customers, including flexible demand services such as managed electric vehicle (EV) charging, and new possible network tariffs, for example tariffs that incentivise dynamic EV control.
    - AusNet intends to test these types of new services and tariffs prior to rolling them out at scale, as we do not have any evidence of customer behaviour and response that we can rely on for larger delivery programs at present.

Table 6: Proposed innovation projects for the 2026-31 regulatory period

	INNOVATION PROJECT
	Smarter network management
1	Leading-edge network modelling and data visibility
2	Alternative storage technologies
	New customer services and tariffs
3	Real time sharing of network data
4	CER and electrification toolbox
5	V2G for outage management
6	Tariff trials
7	Flexible demand trials for residential customers

7.15.3. Secondary systems

The dominant trend in secondary systems is toward the application of digital technology devices and systems with in-built intelligence and integrated functionality. These digital technology platforms add value by:

- Increasing functionality, reliability and availability through the use of microprocessors, solid-state devices, digital technology and optic fibre-based communication systems;
- Lowering per function costs whilst increasing performance capability;
- Embedding intelligent diagnostic software that optimises operation and improves asset management;
- Rationalising equipment via functional integration and multiple signal processing capability; and
- Providing remote management facilities for network elements based on real-time data communications.

7.15.4. Approval of Capital and Operational Expenditure Forecasts

AusNet's capital and operational expenditure requirements are determined by the AER in accordance with the criteria set out in Chapter 6 of the NER.

Clause 6.5.7 of the NER requires the distributor's pricing proposal for the regulatory control period to include a total forecast of capital expenditure which it considers is required in order to achieve the following defined capital expenditure objectives:

- Meet or manage the expected demand for standard control services over that period;
- Comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;
- Maintain the quality, reliability and security of supply of standard control services; and
- Maintain the reliability, safety and security of the distribution system through the supply of standard control services.

The AER must accept the forecast if it is satisfied that the total of the expenditure for the regulatory control period reasonably reflects the following criteria:

- The efficient costs of achieving the capital expenditure objectives;
- The costs are prudent and required to achieve the capital expenditure objectives; and
- A realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.

Operational expenditure is treated in the same way, with consistently defined operational expenditure objectives. It is therefore necessary for AusNet's strategies and plans to satisfactorily demonstrate that its expenditure forecasts both achieve the objectives and satisfy the criteria.

8. Electricity Distribution Asset Management Objectives

Electricity Distribution Asset Management Objectives have been developed to guide the development of asset strategies to support the successful delivery of the organisation's strategic objectives.

These Electricity Distribution Asset Management Objectives are aligned to and supplement the overarching Asset Management Objectives[14] and the Electricity Distribution Strategic Objectives[15].

The Electricity Distribution Asset Management Objectives are:

(1) Improve network performance

(2) Leverage advances in technology and data analytics

(3) Reduce bushfire risk

(4) Reduce electric shocks from network assets

(5) Deliver REFCLs

(6) Meet metering compliance obligations

(7) Meet quality of supply obligations

[14] AMS 01-01 Asset Management System – Overview – section 10.1
[15] AMS 01-08 Annual Asset Management Plan

9. Network Performance

9.1. Safety

AusNet's safety framework is discussed in Section 10.3. Health and Safety Management. The company's approach to enhancing network safety is to establish strategies to continuously reduce safety risks to *as far as practicable*.

Safety performance is discussed in *AMS 20-13 Enhanced Network Safety*.

AusNet's Electricity Safety Management Scheme (ESMS) and the Bushfire Mitigation Plan facilitate monitoring and quantification of network safety risks and implementation of remediation programs.

From a public safety perspective, network safety risks are generally caused by an asset failure that results in the escape of electrical energy with potential consequences of electric shock or fire.

Figure 15 and Figure 16 show the number of network-related electric shock incidents and the breakdown of network related electric shock incidents by cause.

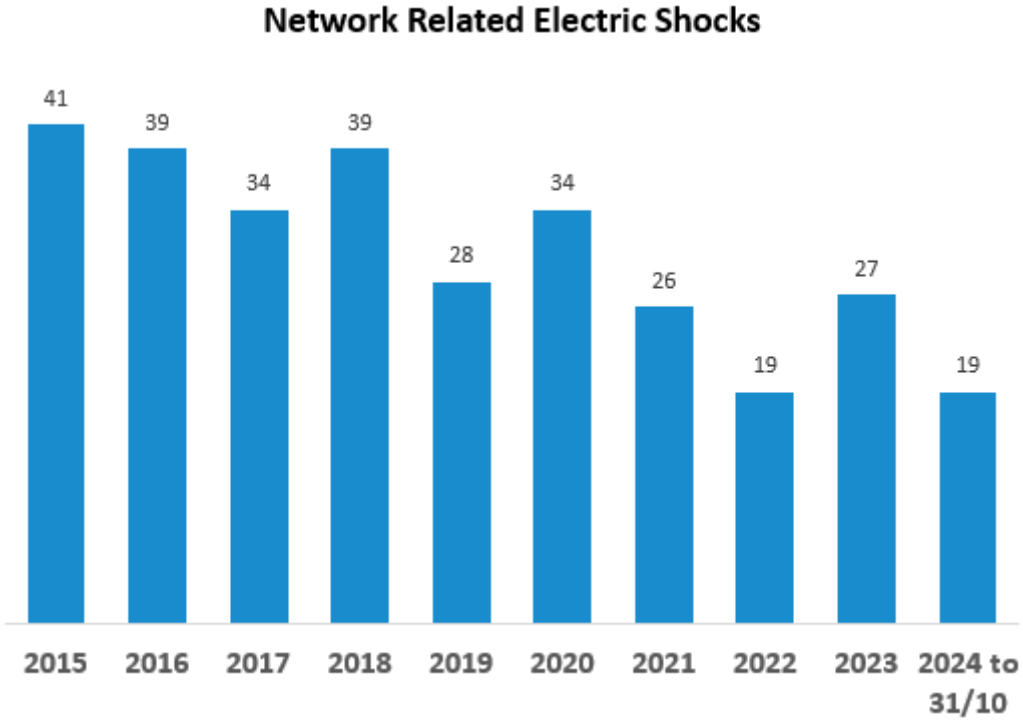

Figure 15: Number of Network Related Shock Incidents

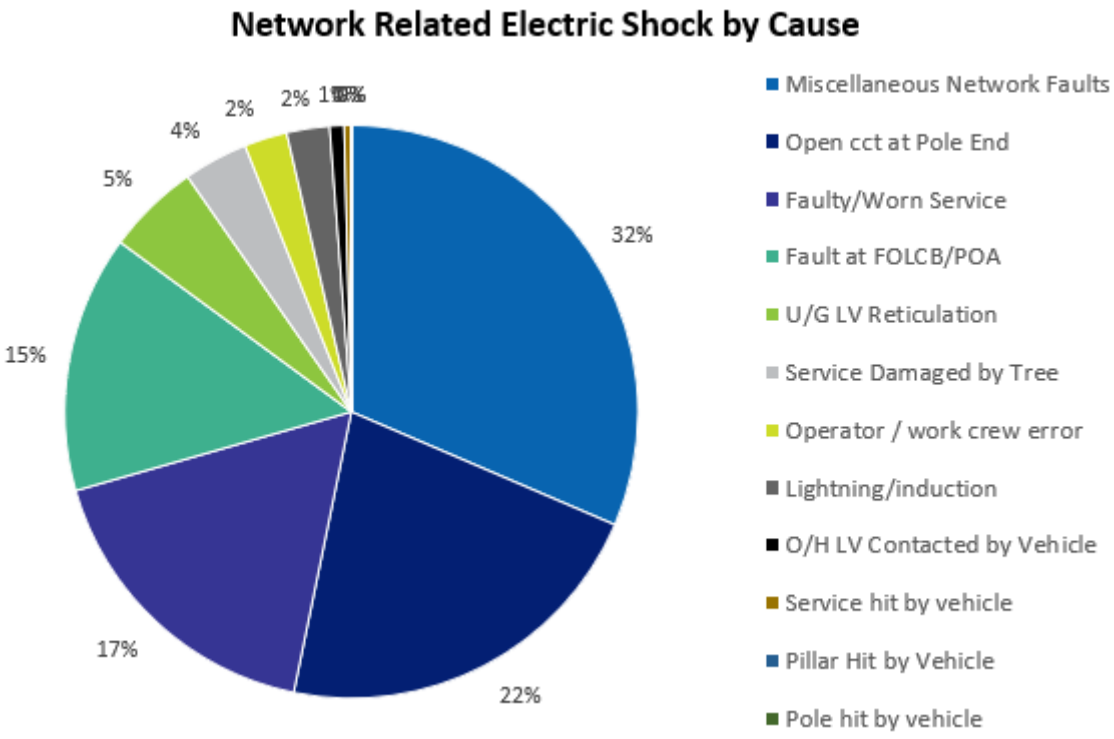

Figure 16: Network Related Electric Shock by Cause

Figure 17 shows the number of fire start incidents for both non-ground (asset) fires and ground fires.

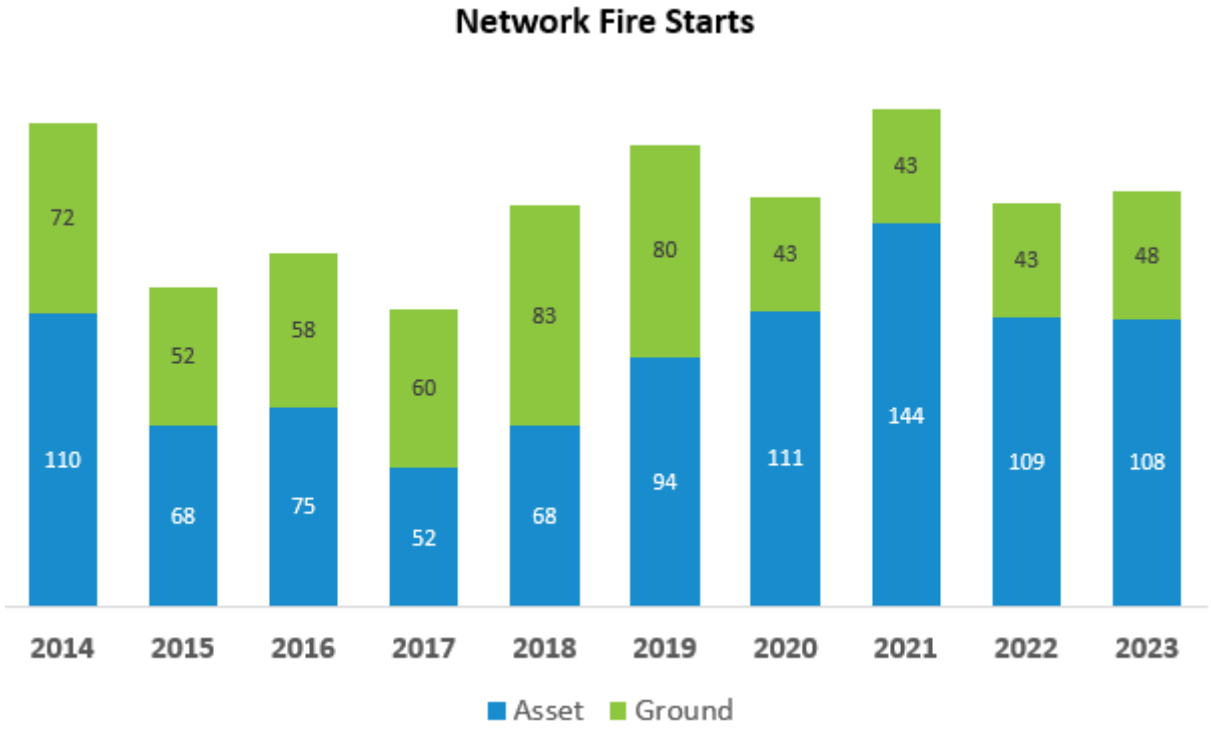

Figure 17: Number of Fire Start Incidents

Figure 18 and Figure 19 show the causes of asset fires and ground fires, respectively.

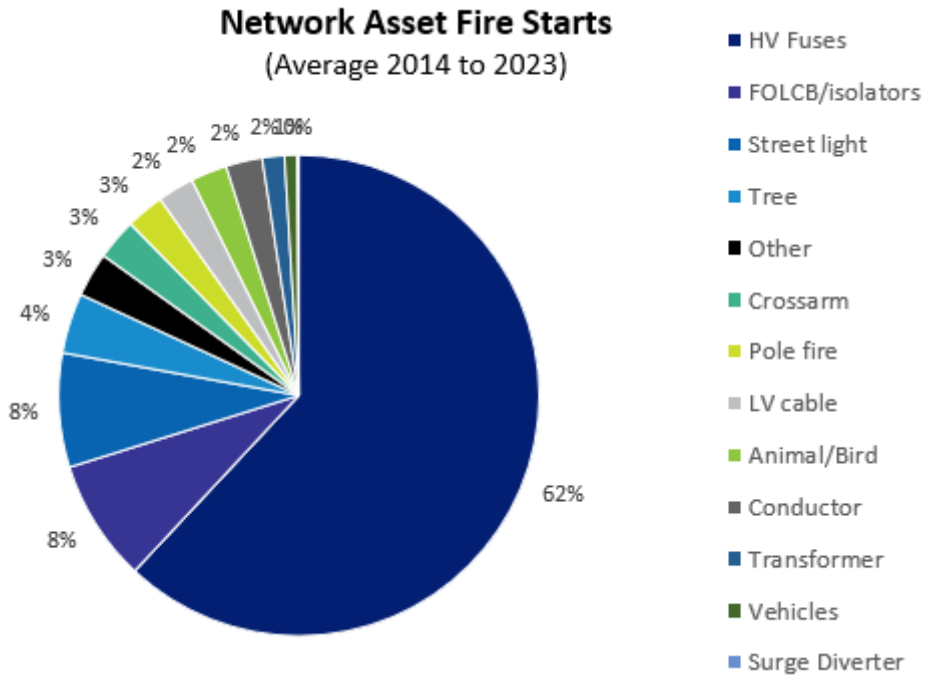

Figure 18: Causes of Asset Fires

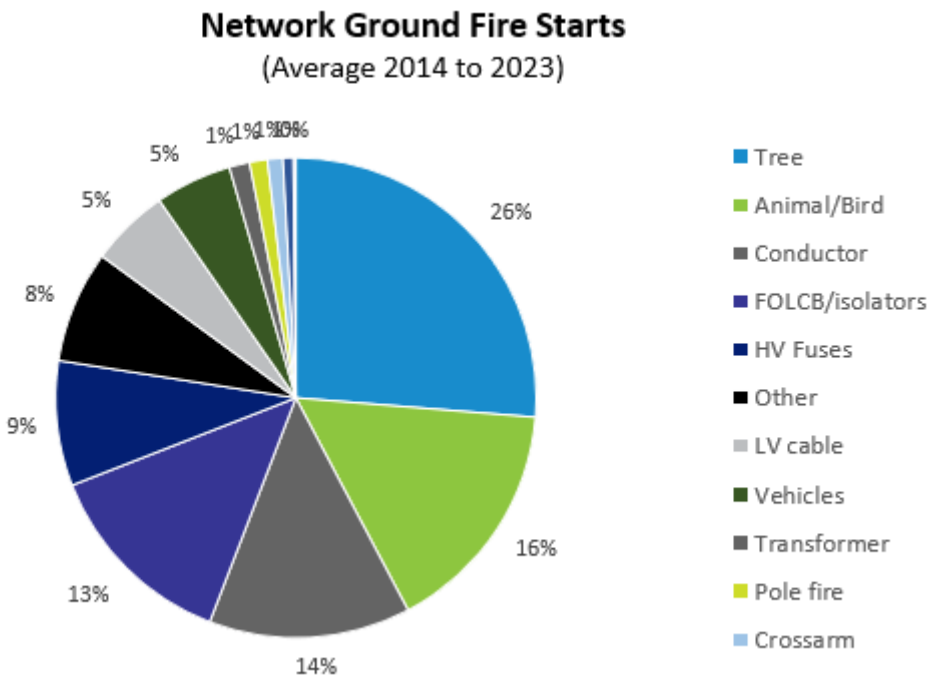

Figure 19: Causes of Ground Fires

AMS 20-13 Enhanced Network Safety Strategy also includes details of:

- Non-asset failures such as vegetation, which are also being addressed through AusNet's Vegetation Management Plan;
- No Go Zone breaches, which continue to be addressed through co-operation with ESV and WorkSafe Victoria in the communication and education of safety hazards to targeted stakeholder groups when working near overhead powerlines; and
- Occupational health and safety risks associated with asbestos, working at heights and explosive failures.

9.2. Capacity

AMS 20-12 Augmentation contains the analysis of the growth in customers supplied and associated peak demand, the impact of demand growth on asset utilisation and load-at-risk. It also summarises the planning standards and forecast work necessary to meet customer expectations for capacity, quality, reliability and security of electricity supplies.

9.2.1. Network Utilisation

Network utilisation at zone substation level is calculated as total non-coincident peak demand in MVA divided by total installed nameplate capacity in MVA. Utilisation peaked at 78.5% in 2009 primarily due to the very hot summer of 2008/09.

Figure 20 presents the historical zone substation utilisation for AusNet's distribution network since 2015 based on information provided to the AER and published through the annual Regulatory Information Notice (RIN) process. (Utilisation percentage has been calculated as the annual non–coincident summated raw system annual maximum demand divided by total zone substation transformer capacity).

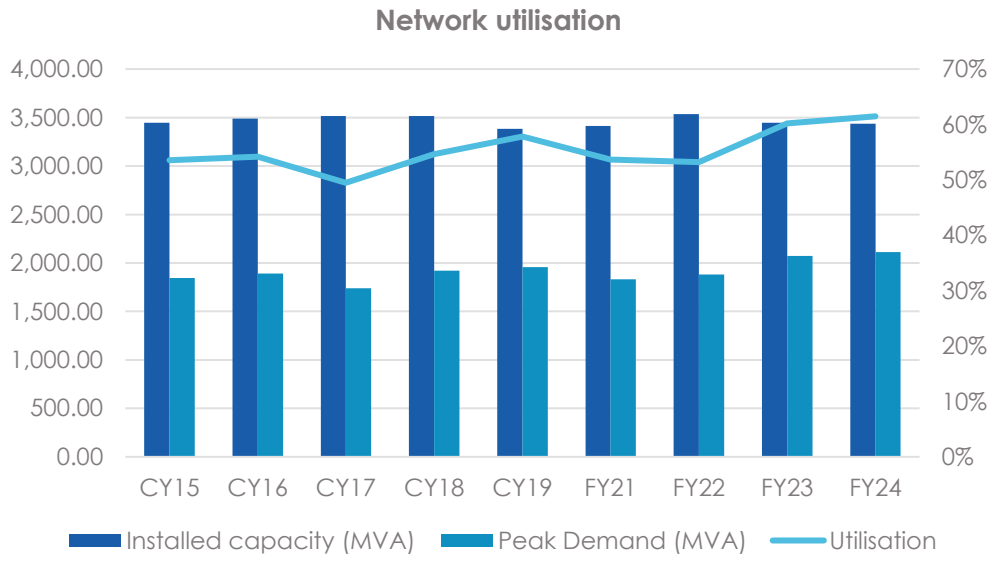

Figure 20: Peak Demand, Capacity and Utilisation (Source: AusNet RIN data)

More detailed information on load growth forecasts is provided in *AMS 20-12 Augmentation*.

Ongoing network augmentation investment and significant expansion of the network in targeted urban growth corridors has managed the strong growth demand and new customer connections.

Overall zone substation peak demand utilisation has softened from the peak of 79% in 2009 and remained below 70% every year apart from 2021. The installation of additional capacity at zone substations, in combination with consumer response to the critical peak demand tariff, improvements in appliance efficiency and building thermal efficiency and consumer installations of solar photovoltaic (PV) arrays have driven this reduction in utilisation.

The distribution network provides connection for a substantial volume of embedded generation (EG) (small units, close to load, 3kW-5MW) as shown in Figure 21.

Solar PV and wind generation has increased significantly. The increase in wind generation in 2015 is attributable to the Bald Hills windfarm, which is connected to the sub transmission system. There has been rapid growth in small scale (<30 kW) Solar PV connections, driven by lower technology costs and government rebates. Over 984MW of residential solar PV is currently connected to the LV network and provides more than half of the embedded generation capacity within the network.

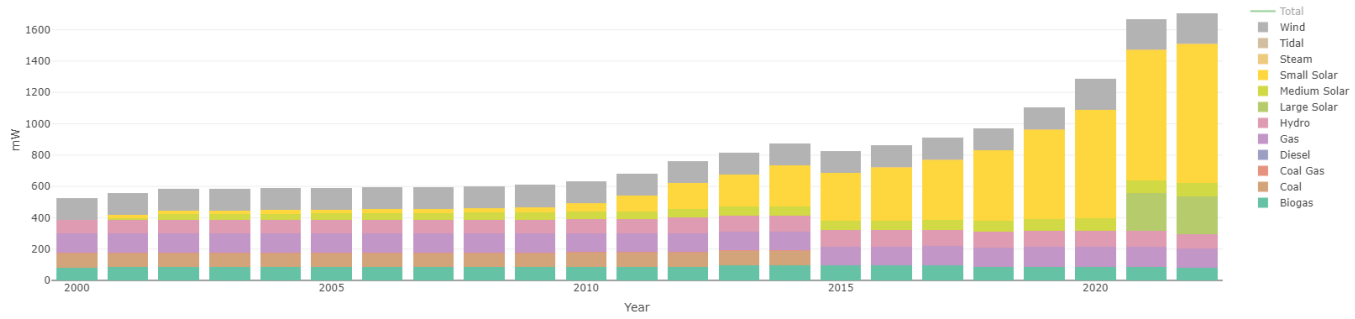

Figure 21: Distribution network embedded generation

9.2.2. Load at Risk

The load at risk at zone substation level (load through the 66/22kV transformers which is above the firm (N-1 rating) of the transformers) provides a high-level view of the supply risk carried in the distribution network. This load at risk trend is shown in Figure 22**Error! Reference source not found.**. The uptake of PV and renewable generation coming on to the network, it is expected that the level of Zone Substation load at risk will remain constant in the coming years.

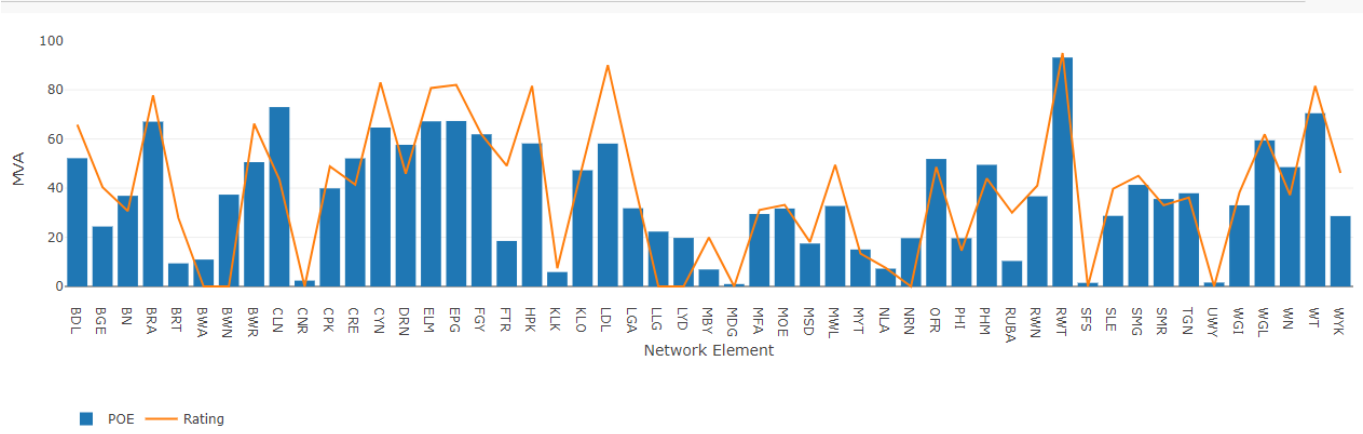

Figure 22: Load at Risk after load transfers

9.3. Reliability

The Distribution network reliability is a critical indicator of customer and network performance.

Evidence suggests that when abnormal events are appropriately excluded, AusNet's underlying reliability performance remains relatively constant as shown in Figure 23 and Figure 24 and an improving trend for unplanned system average interruption frequency index (USAIFI).

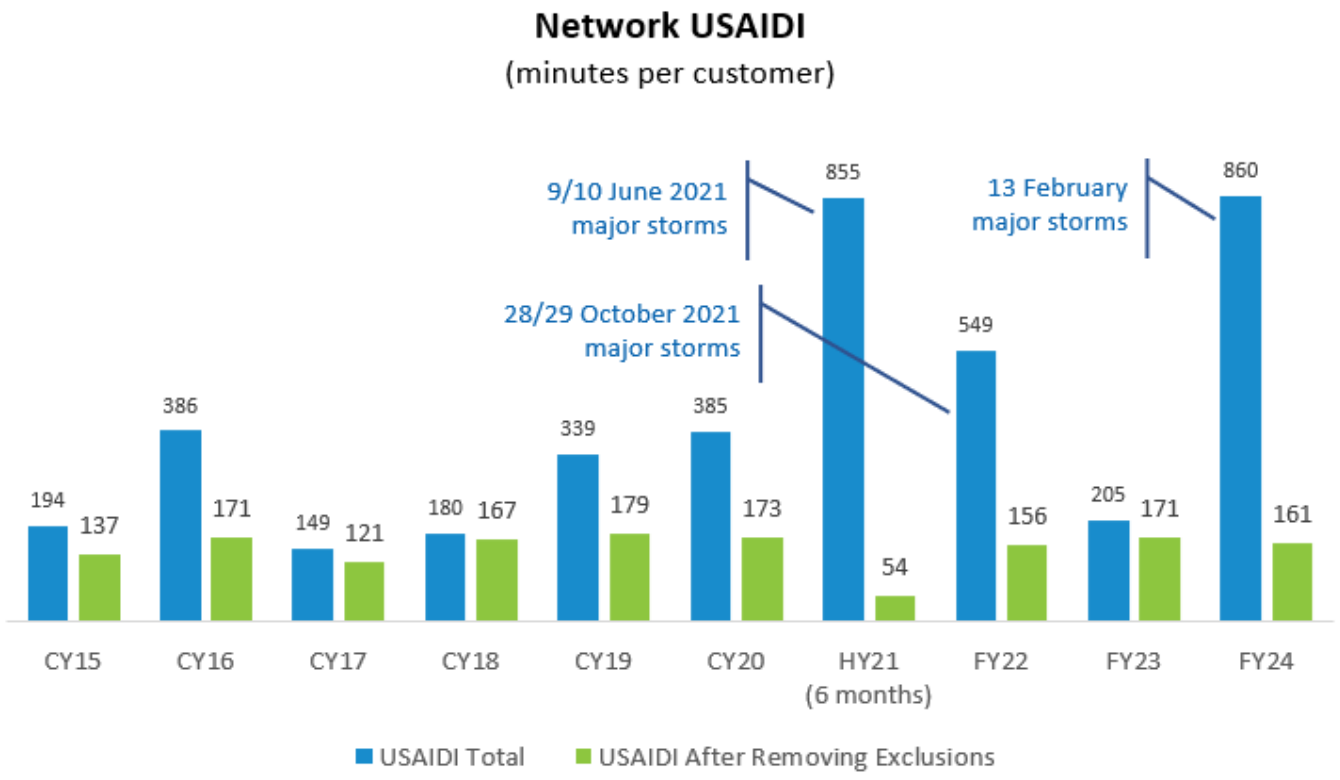

Figure 23: Unplanned SAIDI Performance

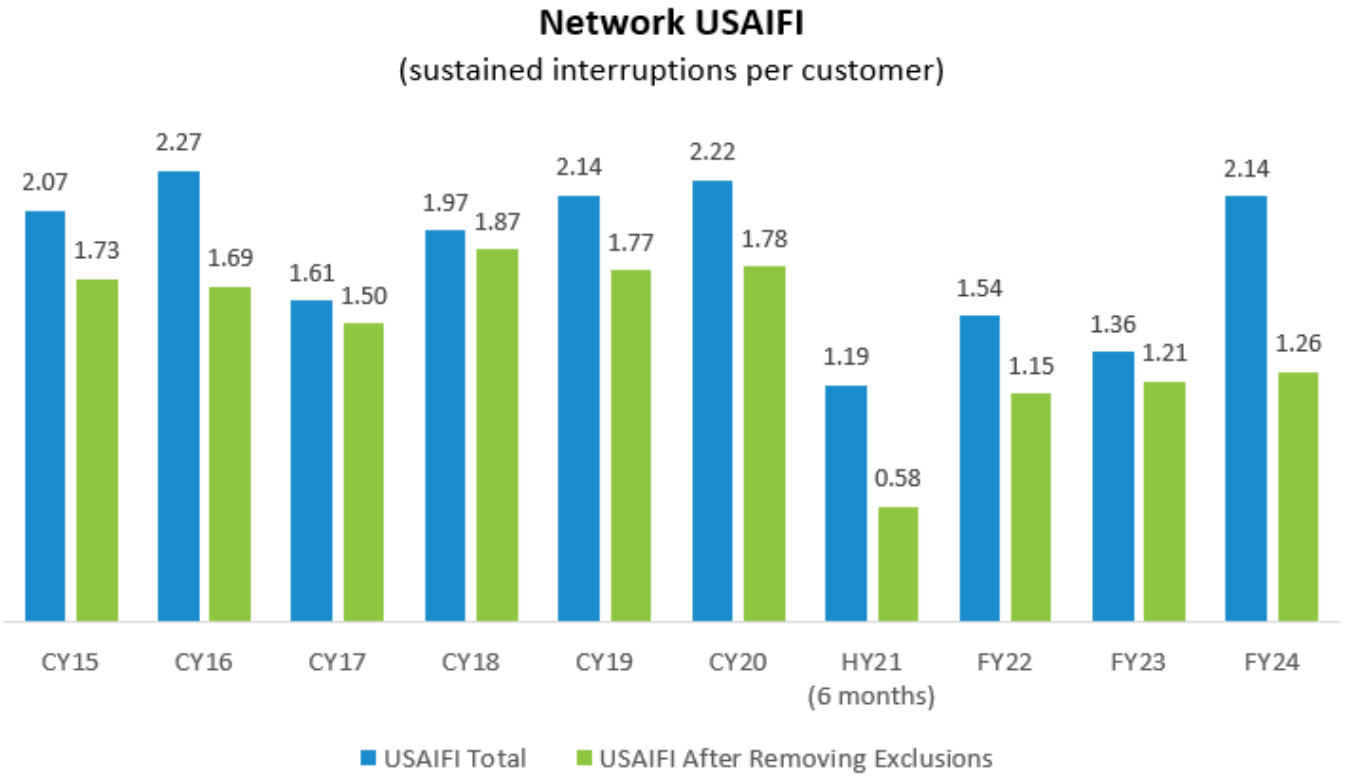

Figure 24: Unplanned SAIFI Performance

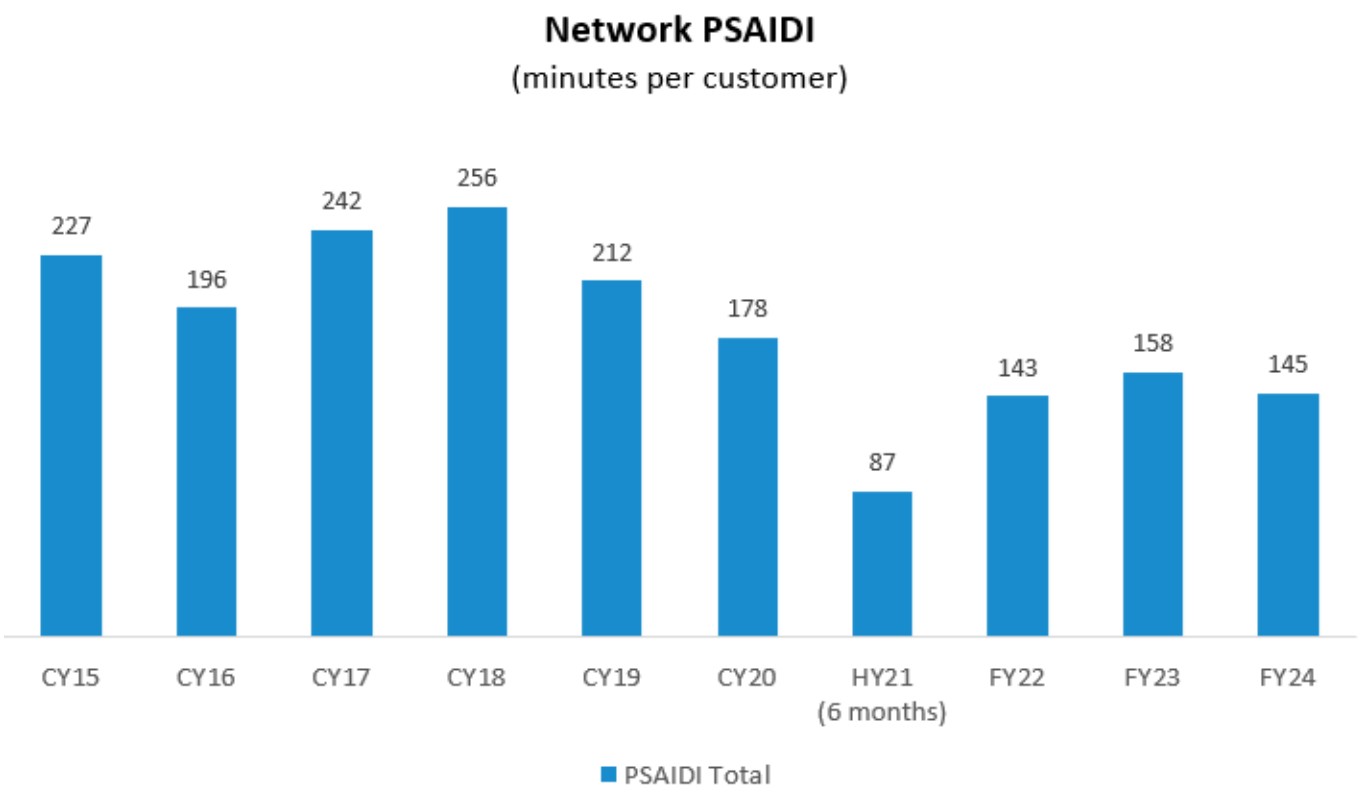

Figure 25: Planned SAIDI Performance

10. Process and System Strategies

This section covers the major processes and systems required to manage the distribution network for the achievement of the desired outcomes.

In April 2014 the electricity distribution asset management practices were certified to *ISO 55001 Asset Management – Management Systems: Requirements* following transition from the superseded British Standard Institute's publicly Available Specification *PAS 55 1:2008 Asset Management*. The asset management system was recertified in September 2017.

Although AusNet's certification lapsed in 2020 due to the external audit being postponed, the asset management system has been maintained to the same level to ensure ongoing best Asset Management practice and recertification when the next audit is undertaken.

In June 2024, AusNet engaged, independent Certified Asset Management Assessors (CAMA), via consultancy Assetivity to assess asset management maturity across its business against the ISO55001 asset management standard using the IAM assessment tool.

(ISO 55001 is a critical part of the ISO 55000 family of standards, focusing specifically on the requirements for a robust asset management system. This standard details the criteria necessary for establishing, implementing, maintaining, and improving an asset management system).

The maturity levels of the 27 ISO 55001 "shall clause" requirements for asset management systems were assessed as being between 2 (Developing) and 3 (Competent). There are 25 recommendations to increase Asset Management maturity to ISO 55001:2014 - level 3 (Competent) and therefore AusNet's Asset Management System is substantially aligned to the requirements for ISO 55000 accreditation.

Certification can be granted where maturity levels are at 2.5, with controls and plans to show the pathway to level 3. As noted in its Asset Management Policy, AusNet is committed to a return to full ISO55001 accreditation and certification in the future.

10.1. Risk Management

AusNet operates a corporate Risk Management Framework[16] based on AS/NZS ISO 31000 Risk management – Guidelines. The framework is a blueprint to manage risk consistently across AusNet.

Risks are rated and prioritised under the following consequence categories:

- Health and Safety (Employee and Public)
- Environment and Community
- Reputation
- Customers
- Project
- Regulation, Legal and Compliance
- Management Impact and People
- Financial Impact (cash)

By adopting common metrics across the broad range of business risks and investment portfolios, AusNet can more effectively manage business risks and optimise network outcomes and objectives.

[16] RM 10-01 Risk Management Policy and Framework, 2020, AusNet Services

AusNet uses a range of techniques to identify, analyse, and evaluate risk and thus determine the appropriate risk treatment for each asset class.

The various risk assessment techniques are applied depending on the asset type and the asset data available. The range of resulting risk treatment actions are compared, contrasted and brought together using engineering judgement to inform the management of risk and development of maintenance programs and replacement forecasts.

Key strategies for the management of business and asset risks include:

- Integration of the risk management process into all processes used to make significant decisions and to deal with changes;
- Key controls are identified and allocated to nominated control owners for periodic verification that they are adequate, effective and cannot be cost effectively improved;
- Conduct analysis after any significant incident, event, change or decision to learn from both successes and failures. This will include the use of root cause analysis;
- Maintenance of Emergency Operations Management Plans, the Mutual Aid Plan and Disaster Recovery Plans through AusNet's Integrated Response and Contingency System, SPIRACS[17];
- Maintain standardised asset design, installation, operation and maintenance procedures;
- Establish contingency and risk mitigation plans where network risks have been identified as unacceptable;
- Utilise economic net benefit modelling and program prioritisation techniques;
- Manage risks 'as far as practicable';
- Determine asset risk level for key equipment;
- Develop and implement risk-based maintenance plans for key equipment; and
- Enhance risk-based replacement and refurbishment programs.

Further information can be found in *RM 10-01 Risk Management Policy and Framework* and *AMS 01-09 Asset Risk Assessment Overview*.

10.2. Electricity Safety Management System (ESMS)

AusNet maintains an accepted Electricity Safety Management Scheme (ESMS) as required under the Electricity Safety Act 1998, in compliance with the *Electricity Safety (Management) Regulations 2009* and *AS 5577 Electricity Network Safety Management Systems*.

The ESMS forms an outcome based regulatory framework against which ESV maintain regular audits to monitor AusNet's compliance.

AusNet's Electricity Safety Management Scheme (ESMS) applies a full life cycle asset management philosophy for the management of its electricity distribution network. This management philosophy supports a continuous improvement approach toward the development and maintenance of preventative strategies designed to network safety risk.

In summary, the scheme contains information on:

- Executive officers responsible for the network;
- A description of the location, extent and scope of the scheme;

[17] 30-4006 AusNet Services' Integrated Response and Contingency System

- A formal safety assessment including methodology, hazards identified and measures to reduce those hazards;
- A description of the management scheme including content, responsibilities, formal policy, technical standards applied and an asset management plan detailing the change management process;
- A system authorising access to the network and preventing access by unauthorised persons;
- Emergency preparedness plans;
- Monitoring, auditing and reviewing processes;
- Key Performance Indicators;
- Incident reporting and investigation processes;
- Competence and training;
- Record keeping; and
- Reporting procedures for serious incidents.

Further details can be found in *ESMS 20-01 Safety Management System (Electricity Distribution)*.

10.3. Health and Safety Management

As explained in Section 4.9. Safety Vision, the AusNet safety vision is symbolised by the simple expression missionZero.

The AusNet's health and safety management system complies with the Occupational Health and Safety Act 2004 and is certified to the requirements of *AS/NZS 4801 Occupational Health and Safety Management Systems* by enabling a framework to manage health and safety across our business.

AusNet's policy is outlined in *QMS 10-01-1 Health, Safety, Environment and Quality Policy*.

The primary aim of the health and safety management system is to establish an integrated, sustained and systematic approach to safety management in all areas of our activities.

Safety is a core value at AusNet.

Our missionZero HSEQ strategy will be achieved through:

- strong safety leadership;
- safe behaviour;
- safe work environment; and
- safety systems and measurement.

The missionZero enablers are shown in Figure 26. Each of these elements feeds off the others to create awareness, continuous improvement and our goal of missionZero.

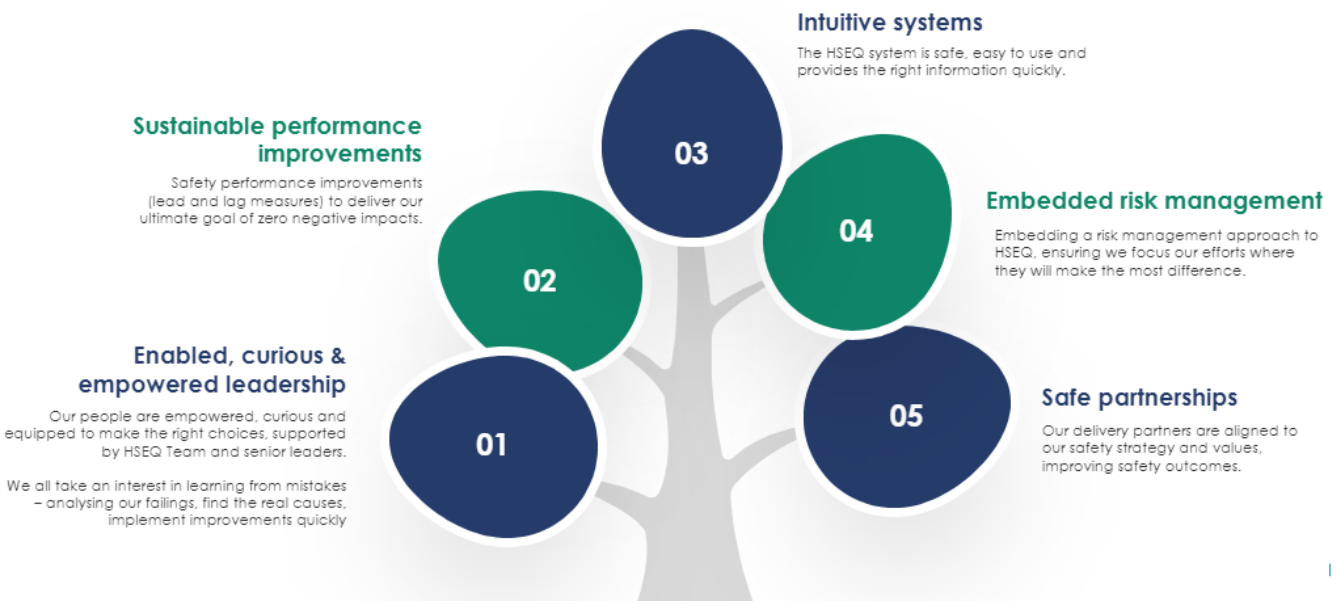

Figure 26: missionZero enablers

AusNet relies on its leaders to set clear behavioural expectations and reinforce the reasons why it is important to work safely. In turn, our people must always have safety "front of mind" and apply safe behavioural decision making guided by our HSEQ management systems (policy, procedures, guidance materials, training and audit program).

To ensure we energise our approach to the above four components of the strategy the following thinking will be used in the development of initiatives:

- Empowering – placing people at the centre of the solution.
- Positive – looking at the health of the safety system as a whole, look for positive outcomes and learning, not only negatives.
- Ethically Responsible – safety will be a matter of integrity, not bureaucracy.

Continuous improvement in HSEQ performance requires a commitment to improving line management accountability for safety and environment. Our leaders take responsibility for the safety of our people.

The AusNet's HSEQ plan has been developed in consultation with the executive and forms the basis of the AusNet's vision and applies to all AusNet's operations.

10.4. Bushfire Mitigation

AusNet has a comprehensive and mature Bushfire Mitigation Plan (BFM Plan) in place that forms part of the ESMS.

AusNet submits an annual BFM Plan to ESV for acceptance. The BFM Plan seeks to mitigate wildfire ignition risks from network assets to levels as low as reasonably practicable. *BFM 21-79 Bushfire Mitigation Manual* and associated procedures contain a suite of policies, strategies, processes and systems to mitigate bushfire risk.

BFM strategies include:

Monitoring and reporting systems:

- Fire reporting, investigation and analysis procedures;
- Management reporting systems and key performance indicators; and
- Work management and prioritisation systems;

Management:

- Management committee with broad representation;
- Auditing and compliance processes and systems; and
- Monitoring of annual bushfire mitigation programs;

Communication:

- Annual advice to customers and stakeholders of their obligations;
- Preparation of annual BFM Strategic Plan for employees and public;
- Advertising of bushfire risks and programs in print and electronic media; and
- Involvement of external and internal stakeholders in annual audit/review program.

10.5. Environmental Management

AusNet maintains a certified *ISO14001 HSEQ Management System* that applies to its networks.

The HSEQ management system is the principal tool through which AusNet identifies environmental risks, develops and implements solutions and monitors success in controlling such risks.

The HSEQ Management System drives the integration of policies, procedures, and objectives pertinent to vegetation management, bushfire mitigation and environmental management to the AusNet HSEQ policy and environmental objectives.

In accordance with the core values of AusNet's Environmental Policy, the following programs have been identified as key environmental outcomes to be achieved:

- Manage oil spill risk;
- Manage asbestos risk;
- Manage noise abatement at zone substations;
- Minimise release greenhouse gases to the atmosphere;
- Manage arsenic risk; and
- Manage vegetation risk.

Success of the above outcomes can be reflected in achievement of AusNet's corporate target of zero environmental compliance notices.

Strategies to achieve this include:

Management of oil discharge:

- Bunding of all plant >1000 litres
- Bunding of plant <1000 litres where environmental risk evident
- Regular inspection and maintenance of plant
- Remote monitoring and alarm of selected bunded installations
- Reporting and monitoring of oil spills
- Maintenance of oil clean-up and mitigation procedures and training
- Investigation into the use of biodegradable vegetable oils for transformer insulation

Management of asbestos containing materials:

- Enhancement of the asbestos register
- Planned removal of asbestos, particularly during zone substation augmentation

- Removal of friable asbestos containing materials
- Maintenance of asbestos handling procedures and training

Management of noise abatement:

- Monitor noise levels of 'noisy' zone substations
- Selection of plant with low noise characteristics
- Maintain existing land buffers around stations

Greenhouse gas reduction:

- Introduction of energy efficient public lighting options for customers
- Replacement of >80W MV public lighting with LED
- Trial of energy efficient technologies (public lighting)
- Monitor and implement where practicable, alternatives to and minimisation of atmospheric release of SF6

Management of arsenic:

- Seek alternatives to copper chrome arsenic (CCA) treated timbers
- Maintain procedures and training for handling and disposal of CCA materials

Vegetation management:

- Compliance with regulations, codes and guidelines, including annual submission of a Vegetation Management Plan to the ESV for approval
- Maintenance of vegetation management systems and training
- Participation and consultation with community forums and stakeholders' groups
- Establishment of sustainable vegetation practices within easements
- Communication to stakeholders of suitable vegetation species within easements.

10.6. Condition Monitoring

The purpose of condition monitoring is to detect early stages of asset degradation before poor condition becomes a significant risk to the safety of personnel, the environment, the asset itself and network reliability.

Condition monitoring is also an essential component of sound asset management which allows AusNet to evaluate, quantify and manage a variety of asset failure risks impinging on compliance, performance and safety through economic maintenance and renewal programs.

Condition monitoring includes a range of technologies (visual inspections, off-line testing, discrete and continuous online and non-invasive scanning techniques) which are constantly developing, more accurate and less disruptive asset condition evaluations.

Annual substation scans including portable radio frequency scans among others are currently occurring as planned activities.

There is an on-going development in the area to achieve earlier warnings at least cost. AusNet will benefit in collaborating efforts for such development and also supporting trials of emerging technologies.

Efforts will also be made to monitor those assets which do not have adequate CM regimes available currently i.e., underground cables.

New condition monitoring systems such as automated image processing using high resolution smart aerial image processing (SAIP) for ASCR (aluminium conductor steel reinforced) conductor condition assessment and continuous partial discharge (PD) monitoring of substations have potential to change the paradigm for reliability, safety and operating expenses.

High level strategies for condition monitoring are:

- Adapt Condition Monitoring (CM) points, integrate with current business process and ensure input to the Enterprise Resource Planning (ERP) System; and
- Consider usability of smart sensors and associated asset data gathering systems.

For further information refer to *AMS 10-19 Plant and Equipment Maintenance*.

10.7. Inspection and Maintenance

Maintenance, and in particular technical maintenance, is a set of processes and practices that aim to ensure the continuous and efficient operation of equipment. Apart from the manufacturer driven periodic maintenance, AusNet has, for some asset classes, employed reliability centred maintenance (RCM) methodologies for planning and optimising maintenance activities.

Typically, the maintenance tasks are categorised as age-based in which case the maintenance tasks are carried out at a specific age (time or other time concept like cycles). Condition-based tasks initiated when one or more condition variable approaches or passes a threshold. Opportunity maintenance are tasks carried out on items taking advantage of other system outages.

10.7.1. High-volume, low-value assets in public places

Most high volume, low-value assets are managed using inspection programs which trigger condition-based replacements. Repair or refurbishment is rarely economically justifiable with the exception of poles where pole reinforcement, or staking may be used to extend the life of a pole.

Public safety, bushfire ignition and supply interruption consequences coupled with deterministic serviceability criteria are used to establish the business rules governing asset inspection intervals and refurbishment and replacement criteria.

The inspection schedules and deterministic serviceability criteria appropriate to poles, cross arms, insulators and similar assets located in public places, or on easements in private property, are documented in *4111-1 Asset Inspection Manual*.

10.7.2. Low-volume, high-value assets in zone substations

The replacement cost for low-volume, high-value assets means that maintenance, repair and refurbishment become viable economic options in the management of this type of asset.

The following assets have risk based and periodic based inspection and maintenance programs:

- Three-phase automatic circuit reclosers;
- Line voltage regulators;
- Air-break medium-voltage switches; and
- Plant and equipment in zone substations.

These assets are subject to a combination of RCM analysis, manufacturer recommendations, and industry experience. Statistical analysis and Monte Carlo simulation techniques are used to optimise inspections and maintenance tasks.

The co-location of assets is an important factor in the optimisation of inspection cycles in zone substations. Maintenance schedules are optimised using asset condition and performance data.

10.7.3. Inspection and maintenance strategies

Inspection and maintenance strategies include:

- Maintain asset recording, condition and performance monitoring systems and processes;

- Selectively increase condition monitoring and diagnostic tests to predict the need, extent and timing of maintenance;
- Where practicable, create new assets with built-in condition monitoring and self-testing facilities;
- Automate the analysis of key asset condition and performance data;
- Monitor and adjust inspection and maintenance cycles to suit performance and condition requirements of network assets;
- Selectively refurbish or replace plant and equipment that is maintenance intensive;
- Enhance the use of asset risk assessment in prioritising the maintenance effort;
- Integrated works management system for work scheduling and planning;
- Integrate portable data application devices in asset inspection and maintenance processes;
- Use benchmarking to identify opportunities to enhance asset maintenance practices; and
- Ensure appropriate stocks of spare parts are held at strategic locations.

10.8. Repair, Refurbishment and Replacement

The concept of understanding asset risk has been introduced to various distribution asset classes. This philosophy assists in the identification of economic options and the optimisation of asset management. The assessment can be applied to pro-active replacements and refurbishments as well as inspections and Opex activities.

Investment in an Asset Performance Management (APM) application like ARM or off-the-shelf product, data access, and data quality will enable and enhance the use of advanced analytical tools in distribution asset management.

The effectiveness of APM can be influenced by the availability and reliability of data, as well as the current levels of asset replacement and expenditure. For some assets, simply methods of determining replacement volumes or inspection frequencies will suffice.

10.8.1. High-volume, low-value assets in public places

Condition-based replacement triggered by inspection programs is the fundamental strategy used to manage the majority of high-volume, low-value assets. The business rules governing refurbishment or replacement to generate a continuous, prioritised refurbishment and replacement program are documented in *4111-1 Asset Inspection Manual* and are used in the electronic asset management system (SAP).

Refurbishment and replacement forecasts for high-volume, low-value assets commence with identification of the homogenous cohorts within each asset class. The service age profile, condition profile and historic replacement rate are established for each cohort from asset management records. Failure rates and associated consequences are then established from outage management records.

The relevant refurbishment or replacement strategy for each asset class is documented in the detailed plant strategies which underpin this document.

In addition to condition-based replacement programs, from time to time there may be compliance-based replacement programs, triggered by things such as the outcomes of the ESV directives from Powerline Bushfire Safety Taskforce (PBST) and Victorian Bushfire Royal Commission (VBRC) recommendations. These compliance-based programs are detailed in *AMS 20-13 Enhanced Network Safety Strategy*.

10.8.2. Low-volume, high-value assets in zone substations

The fundamental principle underpinning the management of low-volume, high-value assets, located in zone substations, is the stabilisation of failure risk. Fleet-risk models are used to quantify the risks associated with assets such as power transformers and circuit breakers.

Probabilities of failure are determined for each asset based on its assessed condition. Condition assessments draw on individual maintenance and failure records as well as fleet averages for similar equipment in other locations. The fleet-risk model aggregates the probabilities of failure for sub-fleets and the overall fleet of assets. This model is calibrated to the prevailing fleet failure rate.

Consequences of failure are calculated from safety impact, environmental damage, and supply interruption consequences for each individual asset. Calibration is achieved by comparison to recent events in the AusNet's network or in similar networks throughout Australia.

Individual items or asset classes identified for replacement are subject to business case development and approval.

Replacement activities associated with zone substation primary and secondary works are often integrated with augmentation works which have defined delivery schedules.

10.8.3. Repair, refurbishment and replacement strategies

Strategies to ensure the timely and cost-effective replacement or refurbishment of assets that ensure a safe and reliable supply of electricity to customers include:

- Undertake periodic reviews of asset condition, technical lives and management strategies;
- Undertake detailed modelling of asset classes to predict future replacements;
- Optimise asset replacement or refurbishment program through integration with asset augmentation programs and/or asset configuration;
- Develop detailed replacement plans for the next 10 years;
- Apply discounted cash flow techniques to quantitative criteria;
- Apply life cycle costing principles to economic analysis;
- Perform economic evaluations that are consistent with the relevant regulatory tests for all major asset renewal projects;
- Avoid asset replacement workload peaks through a combination of asset life extension programs and pre-emptive replacement programs;
- Asset replacement program to maintain zero BFM Index during declared fire season;
- Standardise plant and materials utilised in asset replacement and include training, operating, maintenance and replacement procedures;
- Ensure appropriate stocks of spare equipment are held at strategic locations; and
- New assets have built-in condition monitoring and self-testing facilities.

The relevant refurbishment or replacement strategy for each asset class is documented in the detailed plant strategies which underpin this document.

10.9. Asset Management Information Systems

Key development strategies for the asset information systems include:

- Extend the electronic collection of data via mobile computing devices and automatic links between SAP and SCADA.
- Progressively implement the Enterprise Asset Management program to form a single authoritative asset and inventory register incorporating works management, and logistics management which includes:
- Consolidation of asset data from disparate systems within SAP system.
- De-commission disparate systems.
- Use standardised processes for the same functions across the asset life cycle.
- Establish links from SAP system to other systems to facilitate automatic updates.
- Establish web browser architecture to facilitate remote access by authorised stakeholders to view information and reports.
- Implement a flexible reporting capability that caters for routine and ad hoc requests from stakeholders.
- Ensure that there are appropriate data security and data recovery plans in place.
- Leverage and extend GISConnect to display asset data which provides a net business benefit spatially.
- Remediate data quality issues to support critical business processes and reports.

10.10. Network Planning

AusNet's planning for the sub-transmission network and distribution network is summarised in the *Distribution Annual Planning Report*, which is published on an annual basis and is also available on AusNet's Rosetta Data Portal[18].

This report is prepared and published in accordance with regulatory requirements set out in the Electricity Distribution Code (administered by the Essential Services Commission of Victoria) and the requirements of clause 5.13.2 of the National Electricity Rules (the Rules).

The distribution network planning process provides transparency and facilitate regular opportunities for stakeholders to contribute to the cost-effective augmentation of the electricity distribution network via either network or non-network solutions.

The AER incentivises DNSPs to explore non-network solutions through the demand management incentive scheme mechanism (DMIAM)[19].

Further, the National Electricity Rules require DNSPs to consult with interested parties on the possible options, including but not limited to demand side options, generation options and market network service options to address projected network limitations.

The AER released its final *Distributed Energy Resources (DER) Integration Expenditure guidance note* in June 2022[20] and approved substantial augmentation and innovation programs for the integration of DER in the 2021-26 EDPR Decision. It is a clear funded expectation that networks augment and innovate to enable the integration of DER and related energy exports where it is economic. This is reinforced by Victorian Government expectations for networks to support its Solar Homes and related policies.

Further information on network planning can be found in *AMS 20-16 Distribution Network Planning Standards and Guidelines*.

[18] See AusNet - Rosetta Data Portal
[19] See Demand management incentive scheme and innovation allowance mechanism | Australian Energy Regulator (AER)
[20] See Distributed energy resources integration expenditure guidance note | Australian Energy Regulator (AER)

10.11. Economic Assessment of Projects and Programs

AusNet is focused on delivering optimal distribution network performance at efficient cost. Except in the case where outputs are mandated, this requires an explicit cost benefit analysis to be undertaken to ensure that capital expenditure is allocated most efficiently. The process ensures that initiatives having the highest merit, assessed through cost/benefit analysis are given funding priority.

Projects and programs are selected for inclusion in budgetary provisions via application of high-level cost/benefit comparison between initiatives. The projects and programs arise from planning studies and analysis conducted in developing asset management strategies.

Business cases are developed for individual projects and programs to ensure they are economically efficient via a net present value (NPV) analysis and this process also includes a detailed options analysis against identified alternative solutions.

In doing this, AusNet assesses the incremental costs of delivering an incremental change in network performance to customers, relative to the incremental benefits from the delivery of that enhanced network performance.

The AMS therefore ensures that all decisions to augment, replace or maintain network assets are justified on economic grounds. The benefits are a function of the explicit customer value proposition, or proxy via the adoption of minimum performance standards which are stipulated in legislation or other statutory or regulatory instruments.

The various drivers that are brought to bear when undertaking AusNet's Cost Benefit Analysis are summarised in Figure 27. An assessment of these drivers, both individually and collectively, are fundamental to the cost benefit analysis that underpins AusNet 's approach to managing its network.

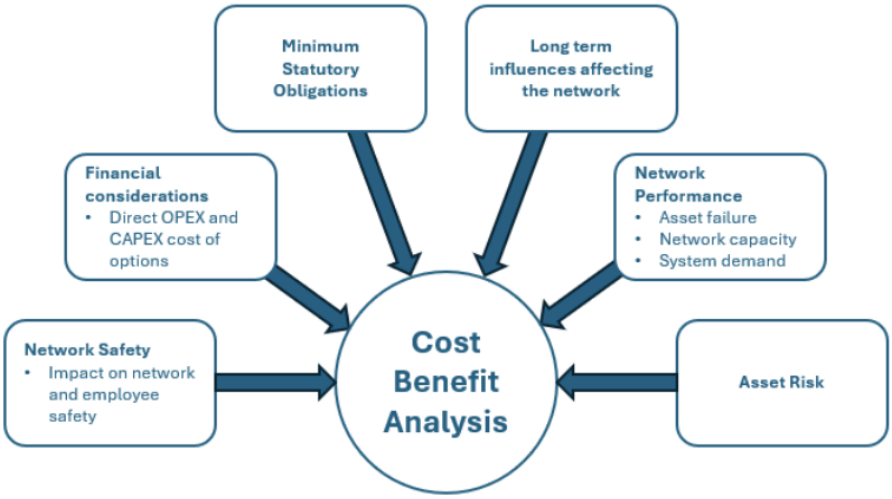

Figure 27: Cost Benefit Analysis Drivers

Final approval of programs/projects requires authorisation in accordance with AusNet's *Delegation of Authority Policy 10-1016*.

10.12. Network Reliability and Resilience

Reliability and resilience are related and interdependent:

- **Reliability** relates to average network performance. It seeks to minimise outage time during normal conditions, including planned outages. Typically measured in normalised outages per customers, or normalised average duration per customer.
- **Resilience** relates to network performance during major events, such as natural hazards and extreme weather. It seeks to either prevent or minimise disruption caused by such events, and to minimise the time taken to recover from them. It may be measured in both normalised or unnormalized outages or average duration per customer.

10.12.1. Network Reliability

AusNet is funded to maintain reliability across the network through the Service Target Performance Incentive Scheme (STPIS) which drives incremental reliability improvements balanced against capital and operating efficiency.

The STPIS scheme is intended to ensure that distributors do not reduce their service levels because of efforts to improve efficiency (typically associated with a reduction in expenditure) and outlines reliability targets based on the level of reliability achieved by a distributor over a recent period. New targets are set every five years as part of the determination process to take account of the most recent performance of the distributor.

AusNet's key for strategies for managing reliability include:

- Monthly reporting of reliability performance;
- Asset inspection and maintenance programs;
- Risk based vegetation management program for safety and reliability;
- Automatic restoration / DFA schemes;
- Zone substation refurbishment projects;
- Targeted asset replacement programs;
- Economic assessment process for projects and programs;
- Trialling of emerging technologies;
- Advanced Distribution Management System (ADMS) enhancements; and
- Network Planning guidelines and design standards.
- Further, in line with the strong feedback received from our customers and the preferences demonstrated through our end-customer research programs, AusNet is proposing a reliability investment program to the AER in its 2026-31 regulatory proposal, including for worst served customers which includes:

- Proposing to uplift reliability on our top 10 worst served feeders which will benefit 10,000 customers; these feeders currently experience 5 to 10 times more outages compared to the network average; and
- Introducing a new express feeder in the Benalla area[21].

- AusNet's consumer engagement has indicated significant concern for those customers that experience lower than average reliability levels either because they are served by unreliable feeders or are in regions with poor reliability.

- In response to this feedback, AusNet is proposing to introduce a Regional Reliability Allowance (RRA) to address poor reliability for other regional customers, on a use-it-or-lose-it basis.

[21] From late 2023 to early 2024, Euroa (approximately 160 km north of Melbourne) experienced unprecedented unplanned outages unrelated to storms or other weather events, with some lasting over 24 hours. The cause of the outage relates to the remote Rapid Earth Fault Current Limiter (REFCL) at Benalla zone substation which has caused technical challenges on the BN11 feeder that services the Euroa area.

10.12.2. Network Resilience

- Along with all other electricity networks, AusNet faces growing challenges from the increasing frequency and severity of extreme weather events that have widespread and devastating impacts. These challenges necessitate a step change in distribution businesses' preparedness, response, and recovery from these events to maintain supply reliability and to protect the ecosystem of essential services that electricity distribution networks sustain.

10.12.2.1. Storm events

- Over the past few years, AusNet has experienced extreme weather events that have caused some of our worst outages on record:
    - 2019/20 bushfires: The "Black Summer" bushfires caused widespread devastation across regional areas and in total, 1,000km of AusNet's powerlines were affected resulting in 60,000 of our customers being off supply. Over 1.5 million hectares were burnt in the fires and more than 300 homes were destroyed. This was the first time the Victorian Government declared a state of disaster.
    - June 2021 storms: On 9 June 2021, major storms caused widespread damage across Victoria. Parts of Victoria recorded more than 280 mm of rain and experienced wind gusts of more than 100 km per hour. Three days after the event, 68,000 customers remained off supply, while more than 9,000 customers remained without supply a week later. At the time, it was the largest storm on record. In total, fourteen 66kV powerlines were taken out of service, fifty-eight 22kV powerlines reported faults and 10 zone substations went black in AusNet's distribution area. This resulted in 249,000 customers being off supply.
    - October 2021 storms: On 29 October 2021 (within months of the June 21 storm) another storm event created widespread devastation. Damaging winds (e.g., 146 km/h at Wilsons Promontory) rain and hail hit Western Victoria, the southwest and Metro Melbourne. As a result, nearly 530,000 customers across Victoria were off supply at peak. Three days after the event, approximately 24,000 customers remained off supply, with over 2,500 customers still without supply after one week.
    - February 2024 storms: On 13 February 2024, Victoria experienced a catastrophic storm event that damaged 12,000 km of powerlines and poles across the state's electricity distribution businesses, causing widespread power outages. Six 500kV transmission towers collapsed and AEMO instructed load-shedding of approximately 92,000 customers, state-wide. The February 2024 storm is the largest that AusNet has experienced, resulting in more than 297,000 of our customers being off supply.
    - August / September 2024 storms: Late August and early September 2024 saw the longest sustained weather event the AusNet distribution network had faced in more than a decade. Since the strong wind conditions began on Sunday 25 August 2024, approximately 93,000 AusNet customers have experienced power outages – with some homes being impacted more than once. The primary cause of the outages was damage to powerlines and poles caused by fallen trees, branches and debris. On 2 September 2024, very strong winds caused further significant power outages that left approximately 112,000 people without power. Impacts of this event were across the AusNet network and the towns of Moe and Warragul were left without power.
- Accordingly, AusNet's 2026-31 revenue submission includes proposed investment in a new category (resilience), and in consultation with customers, AusNet has developed business cases to ensure that our proposed resilience investments meet our customers' needs efficiently.

10.13. Quality of Supply

10.13.1. Steady State Voltage

Key strategies in managing steady state voltages include:

- Using AMI data to identify customers who are receiving steady-state voltage outside Code requirements due to the LV network and continue the ongoing Supply Improvement Program to reduce the number of customers experiencing voltage issues.

- Using AMI data and information from automatic circuit reclosers to identify SWER systems where steady-state voltage is out of code and continue the ongoing program of investment to reduce the number of SWER customers experiencing voltage issues.
- Using AMI data to identify sites where the distribution transformer taps, or the phase connection could be changed to reduce the number of customers experiencing voltage issues.
- Utilising AMI data-based plant utilisation factor (PUF) methodology to improve the detection of overloaded distribution transformers and ensure that expenditure is correctly targeted at distribution transformers that are overloaded and that overloaded transformers are detected before they lead to power quality issues. Continue the ongoing Distribution Transformer Upgrade Program to reduce the number of customers experiencing voltage issues.

10.13.2. Voltage Sags and Swells

Key strategies in managing voltage sags and swells include:

- Assessing the value of installing Neutral Earth Resistors (NERs) at zone substations that are planned to be rebuilt and do not currently have an NER installed. Proceed with the installation of an NER as part of the rebuild project where it is determined to be economic.
- Assess the impact of Ground Fault Neutralisers (GFNs) on transient voltage variations where the GFNs are being installed to mitigate bushfire risk. Consider whether the installation of GFNs can be justified to reduce the impact of transient voltage variations.
- Consider the protection implications arising from Bus-Tie Open Schemes.
- Influence equipment manufacturers to build sufficient voltage sag immunity into their products so that the equipment can ride through common power disturbances.

10.13.3. Negative Sequence Voltage

Key strategies in managing negative sequence voltages are:

- To undertake rectification work where a customer is adversely affected by negative sequence voltages and rectification can be carried out economically.

10.13.4. Harmonics

Key strategies in managing harmonics voltage include:

- Feeder load balance.
- Transposition of 66kV lines.
- Respond to customer complaints on a case-by-case basis and, where necessary and economic, undertake corrective works.
- Consider undertaking a regular review of harmonics at zone substations.

10.14. Network Support Services

Network Support Services refer to the suite of non-network solutions and Demand Management (DM) techniques available for procurement by AusNet to manage the level of energy at risk on the network. Such services can include embedded generation, embedded storage and customer demand response.

Network support may be deployed to defer capital expenditure projects, reduce energy at risk levels or respond to network contingencies.

As set out in *AMS 20-35 Network Support Services*, AusNet evaluates the efficiency of non-network solutions alongside network augmentation solutions when considering its response to forecast constraints.

For larger capacity-driven requirements, this process is formalised by the Regulatory Investment Test for Distribution (RIT-D). AusNet also maintains a register of demand side suppliers and has published a Demand Side Engagement Strategy to ensure that the range of market offers for network support services are taken into account in the network planning process.

Over an extended period, AusNet has managed capacity constraints in the electricity distribution network by contracting permanent generators such as at Bairnsdale, deploying a fleet of containerised, mobile generators in Euroa, and hiring smaller generators for Nagambie and Phillip Island. In 2012 AusNet established a five-year Network Support Agreement to defer augmentation at Traralgon zone substation with an embedded generation service provider. AusNet has also employed temporary installations using smaller capacity diesel fuelled generators to mitigate the impact of planned network outages on customers.

In recent years, AusNet has procured the fleet of mobile diesel generators, has engaged large customers to provide demand response under network support agreements and has completed trials into the use of battery storage to provide network support at both grid-scale and behind the meter.

Increasing requirements for more economic and efficient solutions to manage short term constraints have emphasised the importance of non-network solutions and demand management to provide Network Support Services.

Successful use of Network Support Services relies on matching the network performance requirement with the technical performance capabilities and economics of the different types of services.

These services cover demand-side response and installation of non-network solutions, and comprise:

- Commercial and Industrial Customer Demand Management;
- Embedded Generation (EG);
- Battery storage; and
- Residential Customer Demand Management (or Demand Response).

Network support services are usually applied in one of three main situations to help reduce the risk of customer supply interruption or avoid overloading network assets:

- Planned support to avoid forecast overload of feeder thermal ratings;
- Planned support to avoid forecast overload of zone substation N-1 ratings; and
- Unplanned emergency response to network contingency events.

AusNet has identified residential demand response as a key area in which to develop future network support capability. The introduction of advanced metering technology and availability of third-party aggregation services have opened the prospect of addressing residential peak demand at-source.

Potential measures include:

- Tariff-based measures;
- Critical peak-demand rebates;
- Demand Response Enabled Device (DRED) controls;
- Demand limiting via smart meters; and
- Embedded generation.

AusNet intends to engage further in this area of residential demand response.

Other technologies that have been identified as potential future options for network support include thermal storage in building cooling systems, high-efficiency cooling systems such as ground-source heat pumps and fuel cells that could offer network support generation with lower emissions of greenhouse gasses and noise compared to diesel generation.

10.15. Infrastructure Security

AMS 20-14 Infrastructure Security focuses on security enhancements for more than 50 zone substations, 2500 ground-mounted kiosks, voltage regulators, substations and indoor substations forming part of AusNet's electricity distribution network.

The Infrastructure Security Risk Assessment Tool (ISRAT) is used to assess physical security risks and control measures in AusNet's installations. *AMS 20-14 Infrastructure Security* is informed by more than 50 individual assessments of major sites, and 20 generic assessments for the multiplicity of less significant installations. These assessments are enhanced by a representative sample of physical inspections by qualified and competent Security Risk Management practitioners that validate the ISRAT findings.

AusNet's physical security control measures are founded on the following principles:

- Consistent risk identification and quantification;
- Defence in depth – increasing the number and sophistication of control measures commensurate with the degree of intrusion risk;
- Deterrence – measures including signage, lighting, site attendance, law enforcement awareness training (leading to patrol attendance) and more to deflect would-be intruders towards other targets;
- Delay – measures including locks, fences, barbed wire and lighting to increase the time and effort required to successfully intrude;
- Response – Mobile Patrol and Security guarding measures to deal with intruders and associated consequences promptly and appropriately; and
- Contingency planning – measures to promptly recover service and minimise societal impact.

SPIRACS is AusNet's Integrated Response and Contingency System and contains detailed instructions to inform and instruct a person tasked with managing security at any impacted sites to do so competently and comprehensively.

AusNet's Corporate Security Policy[22] details an organisation wide approach to security preparedness and, amongst other things, provides a detailed framework for the application and administration of access control protocols dictating staff access to sites.

10.16. Program Delivery

AusNet has a Group Portfolio Management Office which is a centralised function responsible for advice, oversight and assurance of capital works across AusNet through robust standards, frameworks and ways of working. This group is responsible for:

- Setting company-wide project and portfolio management standards and procedures from idea to value realisation, while providing oversight and assurance of in-flight capital works.
- Maintaining portfolio and project management competencies and standards including templates, tools, guidance and expectations for all capital projects.
- A 'one approach' to plan and prioritise, so we are investing in the right investments and projects that deliver value.
- Leading Communities of Practice (CoP) to foster a culture of best practice standards and continuous learning for Portfolio Planning & prioritisation, Project Governance & Performance and Project Management.

[22] PRS 10-01 Protective Security Policy Statement

- Facilitating capital investment release and governing portfolios in line with organisation objectives and agreed plans (Capital, Regulatory etc.) and assessing projects throughout their lifecycle, monitoring compliance to plan, tracking decisions and confirming impacts of deviations known.
- Capital portfolio performance reporting identifying progress to plans and threats/opportunities to enable proactive decision making.

AusNet's Project Governance Framework and Stage Gate Process sets out the process for managing programs and projects from conception, through the planning, business case approval, release, delivery and close out phases.

The Project Governance Framework – Stage Gate Process is shown in Figure 28. The Project Governance Framework is supported by detailed work instruction documentation and an internal resourcing model.

Program delivery is further supported by the formation of strategic alliances with external companies that provide design services, installation services and maintenance services.

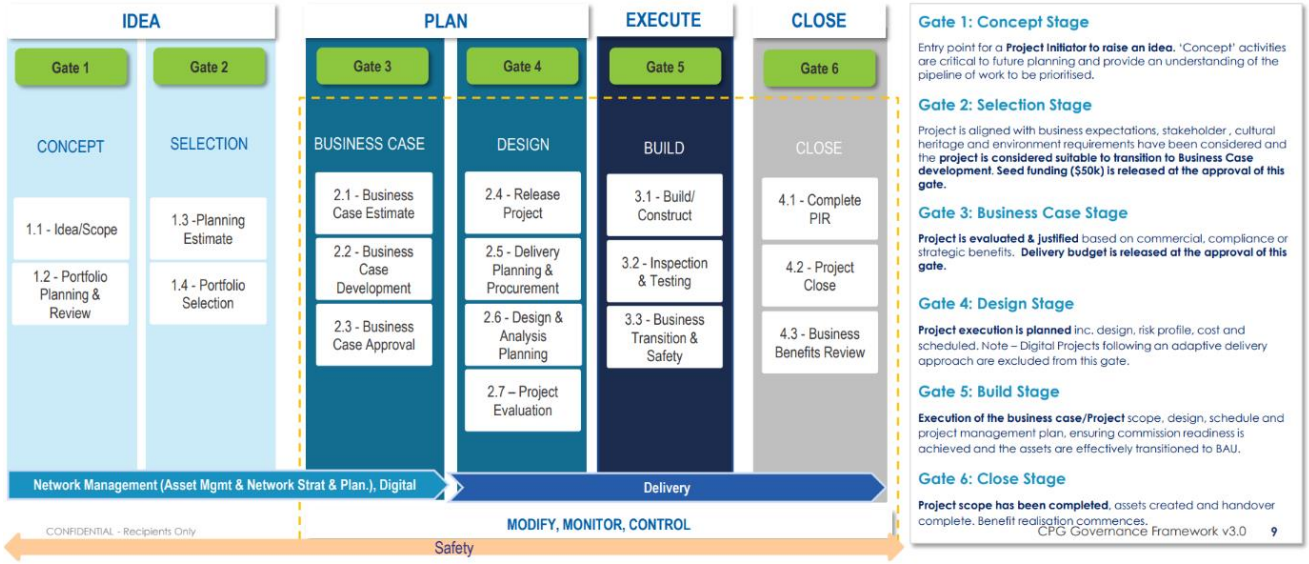

Figure 28: Project Governance Framework – Stage Gate Process

The Program Delivery group provides management and resources to deliver the AusNet maintenance and capital works programs relating to network assets.

AusNet's strategic procurement arm supports the supply chain process for delivery of the investment program, ensuring it is ethical and sustainable. This group is responsible for:

- Strategy for AusNet's spend with suppliers to support the line of business strategic goals and to enhance value and manage commercial risk;
- Supplier relationship management through development and execution of strategies for supplier relationships, based on their significance to the business, fostering innovation, shared objectives, and delivering improved outcomes;
- Supply chain resilience by proactively identifying, categorising, addressing and reporting risk causes to maintain business continuity;
- Centre-of-excellence to cultivate advanced capabilities and to integrate best practice in competency development, processes and technologies;
- Commercial advisory to the lines of business throughout the procurement and contract management lifecycle, for cost management, risk optimisation and issue and dispute resolution;
- Logistics to develop and execute the AusNet logistics strategy and deliver logistics operations.
- Property management, which secures tenure or occupancy rights of land, buildings and easements for our network assets; and assists in compliance with obligations relating to town planning, environmental and cultural heritage matters; and

- Procurement sustainability leadership to develop and implement a framework and initiatives, to align with and support the AusNet's sustainability goals and regulatory obligations.

10.16.1. Strategic deliverability

For the 2026-31 regulatory period, AusNet has developed a Strategic Deliverability Plan. This plan details the processes, strategies, plans and initiatives AusNet has in place to deliver on its business objectives, prioritise communities and customers and as part of these longer-term goals, ensure its works programs are feasible and deliverable.

The plan recognises a significant forecast increase in capital investment compared to actual and expected expenditure in the current regulatory period. (This increase is driven by both price increases and the need to deliver more work to meet our customers' expectations and the requirements of the energy transition, including enabling government Net Zero targets to be met).

Work volumes will gradually increase prior to 1 July 2026, enabling AusNet to increase resources gradually over time and have plans in place as to how we will continue to build the efficient level of resourcing necessary to deliver our forecast works program. The plan outlines key responses across the following areas: labour, supply chain, digital enablement, digital delivery and outage management.

10.17. Operations Management

In October 2024, AusNet announced that following a review, it would introduce important changes to its operating and service delivery model for the electricity distribution network to provide better outcomes for customers, enable a stronger presence in the community, and improve the operations and maintenance of the network.

AusNet's new strategic direction will see it insource core operational assets, re-establish critical capabilities over time, and take greater control of our operations to better serve our customers. As part of this change AusNet announced it has engaged Zinfra as the new service delivery partner for distribution operations and maintenance activities, commencing in August 2025, when the current contract with Downer expires.

The operation of the overall system and of individual assets remains a key part of asset management to ensure that system performance targets are achieved, the integrity of the assets is not compromised, and safety and environmental requirements are met.

Current sites have different information sent back and in differing formats together with overlap in responsibilities for systems and processes that add to the complexity of managing the distribution network.

An over-riding principle is to ensure that operational staff have access to systems that can provide them with relevant information in a format that assists them to make timely and accurate decisions.

11. Abbreviations and definitions

TERM	DEFINITION
ACR	Automatic Circuit Recloser
AEMC	Australian Energy Markets Commission
AER	Australian Energy Regulator
AMI	Advanced Metering Infrastructure
AMS	Asset Management Strategy
ASCR	Aluminium Conductor Steel Reinforced
BFM	Bushfire Management
C&I	Commercial and Industrial
CCA	Copper Chrome Arsenic
CM	Condition Monitoring
DER	Distributed Energy Resources
DFA	Distribution Feeder Automation
DM	Demand Management
DMIA	Demand Management Incentive Scheme
DNSP	Distribution Network Service Provider
DOMS	Distribution Outage Management System
DSP	Demand Side Participation
DSO	Distribution System Operator
ECM	Enterprise Content Management
EG	Embedded Generation
ENA	Energy Networks Australia
ERP	Enterprise Resource Planning
ESC	Essential Services Commission
ESMS	Electricity Safety Management Scheme
ESV	Energy Safe Victoria
FMECA	Failure Mode Effect Criticality Analysis
GFN	Ground Fault Neutraliser
GIS	Geographic Information Systems
GSL	Guaranteed Service Level
HBRA	Hazardous Bushfire Risk Area
HSEQ	Health, Safety, Environment and Quality
HV	High Voltage

IRD	Innovation, Research and Development
ISRAT	Infrastructure Security Risk Assessment Tool
IVR	Interactive Voice Response
LV	Low Voltage
MAIFI	Momentary Average Interruption Frequency Index
MV	Medium Voltage
NEL	National Electricity Law
NEM	National Electricity Market
NEO	National Electricity Objective
NER / Rules	National Electricity Rules
NER	Neutral Earthing Resistor
NGERS	National Greenhouse and Energy Reporting Scheme
NPV	Net Present Value
OMS	Outage Management System
PACSIS	Protection and Control Setting Information System
PBST	Powerline Bushfire Safety Taskforce
PCB	Polychlorinated biphenyls
PD	Partial Discharge
PDA	Personal Digital Assistant
POEL	Private Overhead Electric Lines
PQ	Power Quality
PUF	Plant Utilisation Factor
PV	Photovoltaic
RADAR	Ratings Database Repository
REFCL	Rapid Earth Fault Current Limiter
RIT-D	Regulatory Investment Test - Distribution
SAIP	Smart Aerial Image Processing
SAMP	Strategic Asset Management Plan
SAP	AusNet's electronic enterprise resource planning system
SCADA	Supervisory Control and Data Acquisition
SDMe	Spatial Data Management Electricity
SPIRACS	AusNet's Integrated Response and Contingency System
STPIS	Service Target Performance Incentive Scheme
SWER	Single Wire Earth Return
USAIDI	Unplanned System Average Interruption Duration Index

USAIFI	Unplanned System Average Interruption Frequency Index
VBRC	Victorian Bushfire Royal Commission
VCR	Value of Customer Reliability

12. Legislative references

STATE	REGULATOR	REFERENCE
All		Electrical Safety (Bushfire Mitigation) Regulations 2013
All		Electricity Safety (Management) Regulations 2009
All		AS 5577 Electricity Network Safety Management Systems
All		AS/NZS 4801 Occupational Health and Safety Management Systems
All		ISO14001 HSEQ Management System
All	AER	Distributed Energy Resources (DER) Integration Expenditure guidance note

13. Resource references

DOCUMENT ID	DOCUMENT TITLE
AMS 01-01	Asset Management System Overview
AMS 01-02	Asset Management Policy
AMS 01-09	Asset Risk Assessment Overview
AMS 10-19	Plant and Equipment Maintenance
AMS 20-12	Augmentation
AMS 20-13	Enhanced Network Safety Strategy
AMS 20-14	Infrastructure Security
AMS 20-15	Quality of Supply
AMS 20-16	Distribution Network Planning Standards and Guidelines
AMS 20-35	Network Support Services
BFM 21-79	Bushfire Mitigation Manual
ESMS 20-01	Electricity Safety Management Scheme
RM 10-01	Risk Management Policy and Framework
SEF 20-01	Stakeholder Engagement Framework
10-1016	Delegation of Authority Policy
4111-1	Asset Inspection Manual
DAPR	Distribution Annual Planning Report

Table 7 lists the various plant strategies for electricity distribution assets

Table 7: Plant Strategies

DOCUMENT ID	DOCUMENT TITLE
AMS 20-52	Conductor
AMS 20-53	Zone Substation Capacitor Banks
AMS 20-54	Circuit Breakers
AMS 20-55	Civil Infrastructure Sites
AMS 20-56	Indoor Switchboards
AMS 20-57	Crossarms

AMS 20-58	Distribution Transformers
AMS 20-59	Electrical Earths
AMS 20-60	MV Switches and ACRs
AMS 20-61	MV Switches, Disconnectors and Earth Switches
AMS 20-62	HV Switches, Disconnectors and Earth Switches
AMS 20-63	Instrument Transformers
AMS 20-64	Sub Transmission Towers and Insulators
AMS 20-65	Insulated Cable Systems
AMS 20-66	Insulators – High and Medium Voltage
AMS 20-67	Line Surge Arresters
AMS 20-68	Line Voltage Regulators
AMS 20-69	Pole Top Capacitors
AMS 20-70	Poles
AMS 20-71	Power Transformers and Station Voltage Regulators
AMS 20-72	Protection and Control Systems
AMS 20-73	Public Lighting
AMS 20-76	Service Cables
AMS 20-77	Surge Arresters in Zone Substations
AMS 20-79	Neutral Earthing Devices
AMS 20-80	Auxiliary Power Supplies
AMS 20-81	Communication Sites

14. Appendices

None

15. Schedule of revisions

ISSUE	DATE	AUTHOR	DETAILS OF CHANGE
1			Creation
2			2006 Update and editorial
3			2007 Update and editorial
4			2008 Update and editorial
5			2009 Editorial and addition of detailed plant strategy summary
6	Oct 2009	D Postlethwaite	Update following review by Harding Katz
7	27/11/2009	P. Bryant K Gebert	Updates and editorial
8	30/11/2009	P Bryant	Section 7 editorial
9	06/07/2010	C Goff	Update pole expected lives
10	23/08/2010	D Postlethwaite	New AM Policy and formal approval by GGM NSD
11	23/02/2011	P Bryant	Incorporate 'STEM'. Update reliability targets
12	29/10/2012	D Meade	Revision and editorial
13	21/08/2013	D Meade	Restructure, review and update
14	12/08/2014	D Meade	Align network strategies, review and update
15	03/04/2015	D Meade	Review strategies, reliability quality and demand. Align network objectives
16	03/02/2017	J Dyer	2016 Update and editorial
17	17/08/2017	J Lai	2017 Update and edits
17.1	12/04/2018	J Lai	Minor edits, Objectives updated
18	14/12/2018	A Dickinson	2018 update.
19	21/11/2019	A Dickinson	Minor spelling and grammatical changes. General formatting changes and re-ordering for consistency Section 2.7 Updated with Energising Futures Section 2.8 new business plan Section 3.1 demand figures updated Section 3.3 volume figures updated Section 4 revised and policy moved to appendix Figure 7 updated Section 6 reworded with no change to objectives Figure 8 updated Section 7 performance charts updated Section 7.2 revised Section 8.1 updated to include maintenance. Section 8.3 updated with HSEQ Plan FY20

			Section 8.10 details of planning standards removed Section 8.14 updated to align with AMS20-35 Appendix Schedule of Revisions added
20	01/12/2020	J Lai	2020 Update
21	21/09/2021	M Durox	Section 2.1.2 Added paragraph about the ESCV Section 2.3 Updated Community expectations paragraph to include AER expectations Section 2.5 Network Vision changed and updated to Network Transformation section Section 2.7 Updated Corporate purpose, strategy & objectives Section 2.8 Replaced the outdated Asset Management Objectives figure with link to AMS 01-01 Section 2.9 Removed outdated electricity distribution strategic objectives Section 3.3 Updated Asset Summary table Section 5.3.2 Updated Guaranteed Service Level Section 5.12 Updated section with new Environmental Protection Act action plans Section 5.15.2 Added section about Community Resilience Trials Section 6 Updated the Distribution AM objectives to align with AMS 01-08 Section 7.1 Updated all charts Section 7.2 Updated all charts Section 7.2.2 Added note explaining the increase in load at risk since 2017/2018 Section 7.3 Updated all charts Section 8 Added note regarding ISO 55001 certification Section 8.9 Updated data regarding IM & ARM and removed outdated figure about ARM Section 8.10 Added paragraph about the DER guidance note Section 8.12 Added Corporate objective on reliability Appendix C Added AMS 20-80 about auxiliary power supplies
22		M Durox	Updated template Changed “AusNet Services” to “AusNet” Section 2.3 & Section 2.4 Updated by Comms team Section 3.3 Updated by Metering team Section 4.5 Updated by Network Planning Section 5.2 charts updated Section 5.3 charts updated Section 7.1 Safety data updated Section 7.3 Updated section on reliability Section 9.21 Updated charts & comments Section 9.22 Updated charts
23	23/12/2023	G. Hannan	Update for 2026-31 regulatory proposal, including context and relevant strategies.

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