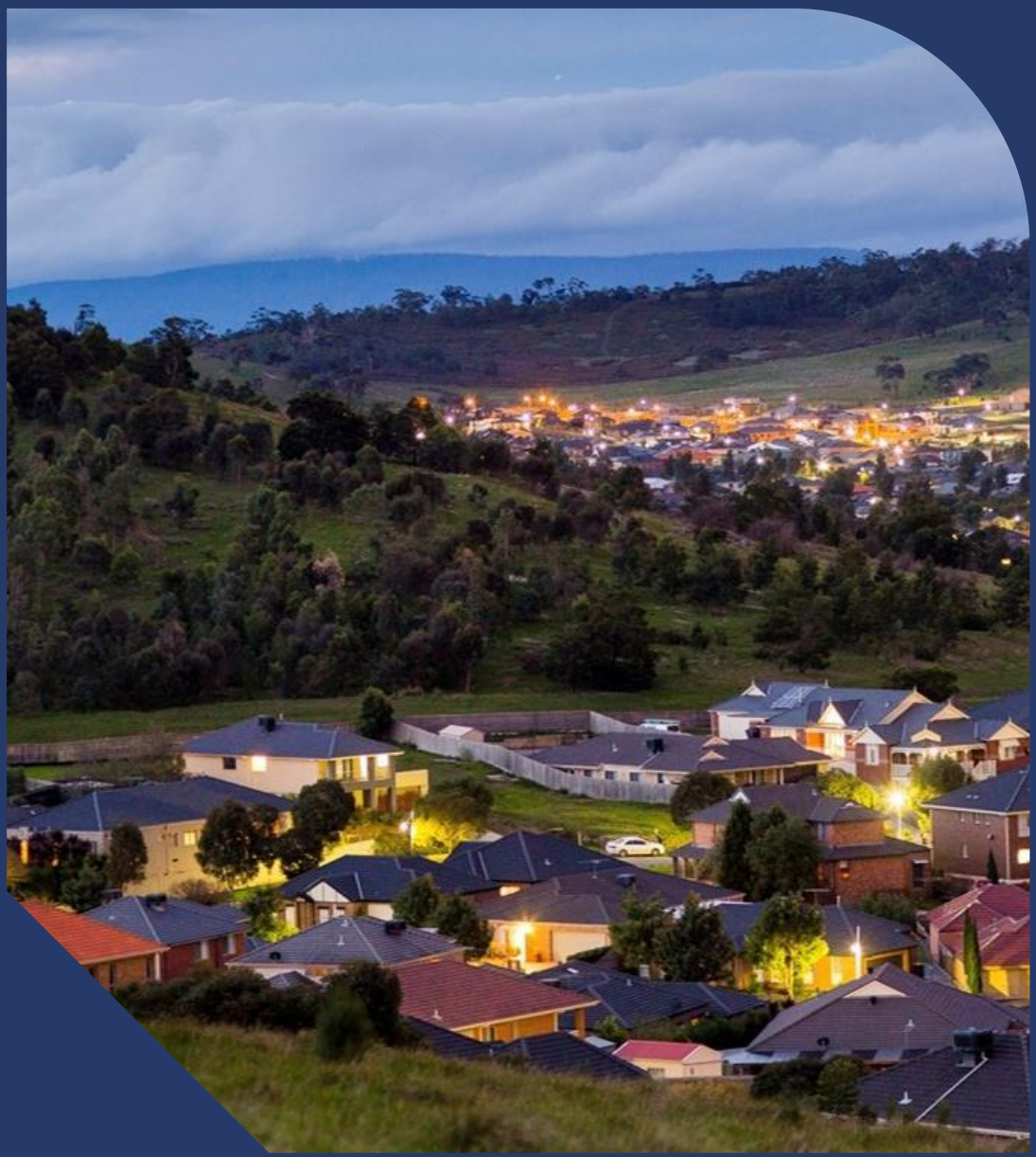
AusNet

Electricity Transmission Asset Management Strategy

Asset Management System



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AusNet

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1. Purpose

The Regulated Electricity Transmission Asset Management Strategy and its supporting documentation provide strategic direction for the responsible stewardship of electricity transmission assets which AusNet manages as a service to Victoria's energy users and more broadly, the National Electricity Market (NEM).

The Asset Management Strategy has the following key functions:

- It sets the framework for AusNet's holistic approach to management of the network assets, and in so doing establishes the linkages with and between the underpinning detailed strategies, processes and plans;
- It provides important context for management strategies, by taking into account 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.
- It sets out the key asset management drivers, objectives and associated management strategies.
- It provides guidance for the development of asset management works programs and network priorities.

The strategy is central to the achievement of AusNet's Asset Management Objectives in accordance with AusNet's Asset Management Policy.

2. Scope

This Asset Management Strategy covers AusNet's electricity transmission assets operating across Victoria[1], including:

- Transmission lines[2], power cables and associated easements and access tracks;
- Terminal stations, switching stations, communication stations and depots including associated electrical plant[3], 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 Supervisory Control and Data Acquisition (SCADA) and asset management information systems (including SAP).

More specifically, the Asset Management Strategy relates to electricity transmission sites and facilities:

- Listed in the Network Agreement between AusNet (then Power Net Victoria) and the Australian Energy Market Operator (AEMO) (then the Victorian Power Exchange) 1994; and
- Listed in 1994 Connection Agreements between AusNet and connected parties, largely consisting of generators, direct-connect customers and distributors.

Unregulated contracted transmission assets are not covered by this strategy and are specifically covered by AMS 40-01 Contestable, Contracted & Unregulated Electricity Asset Management Strategy. These are listed in various supplementary network and connection agreements.

This Asset Management Strategy excludes the assets and infrastructure owned by:

- Generators;
- Demand customers; and
- Other companies providing transmission services within Victoria.

This Asset Management Strategy 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] Plus interfacing assets owned and operated by AusNet Services outside Victoria
[2] 500 kV, 330 kV, 275 kV and 220 kV transmission lines and cables.
[3] 500 kV, 330 kV, 275 kV, 220 kV, 66 kV and 22 kV switchgear and transformers.

3. Transmission Network Overview

The transmission network interconnects generators, distributors, high voltage customers and the transmission networks of NSW, SA and TAS. It serves a population of over 7 million people across more than 3 million households and businesses in Victoria.

AusNet's network comprises more than 6,620 kilometres of transmission lines transporting electricity from generators to electricity distributors and large customers, with regulated and contestable assets operating at voltages of 500kV, 330kV, 275kV and 220kV, as well as sub-transmission assets at 66kV and contestable assets at 33kV and 132kV.

AusNet's electricity transmission network includes assets between the 'point of connection' with generators and distribution businesses and directly connected customers. The configuration of the electricity transmission network is shown in Figure 1, which also shows the interconnection between the other components of the overall electricity system, namely generation and distribution.

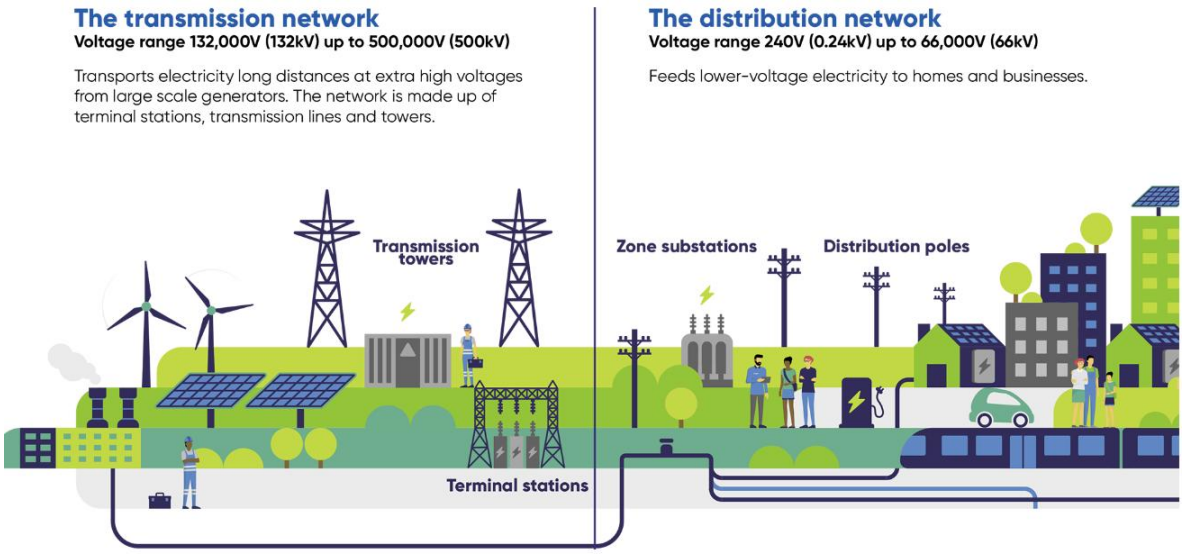

Figure 1: Illustration of Victorian Electricity Supply Arrangements

3.1. Locality and Geography

The Victorian electricity transmission network is depicted in Figure 2.

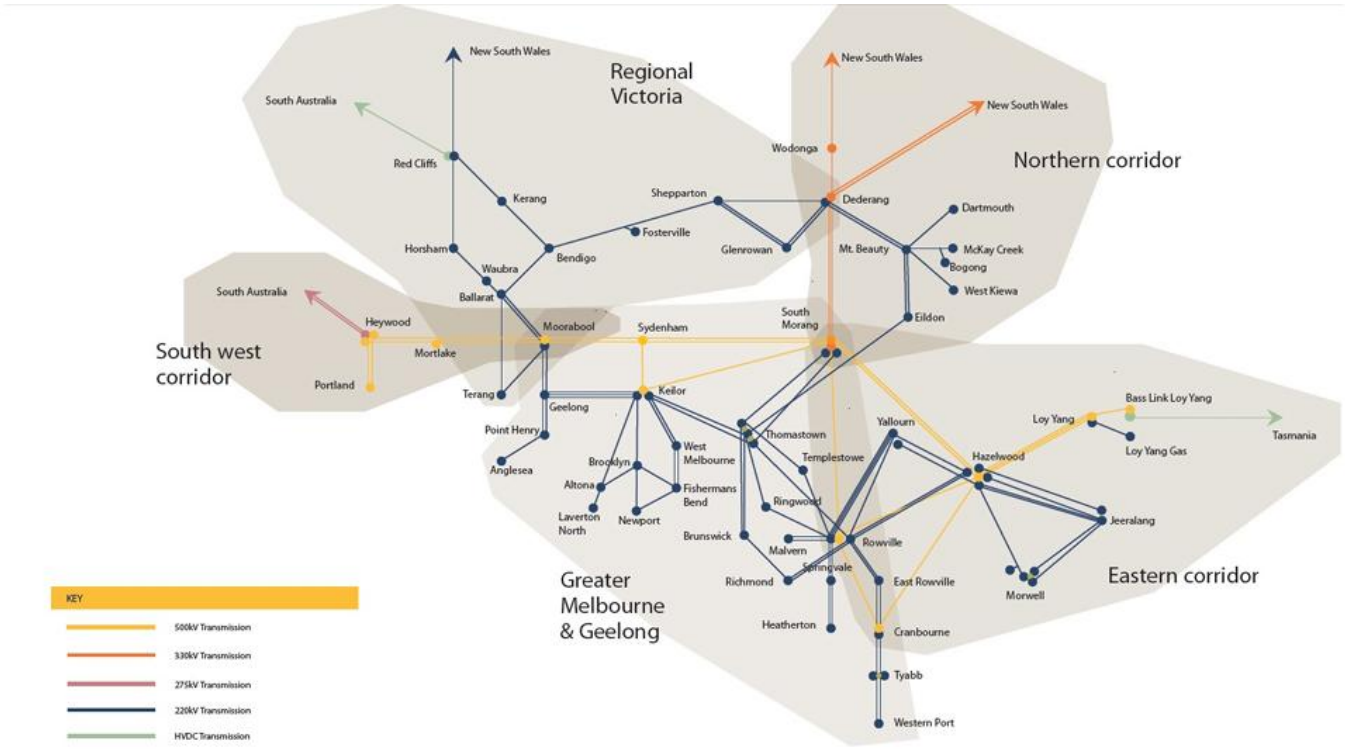

Figure 2: Victorian Electricity Transmission Network

The 500kV network backbone runs from the Latrobe Valley to Melbourne and across the south-western part of the state to Heywood. This 500kV network facilitates the transfer of power between the coal and gas-fired generators in Gippsland (i.e. Loy Yang, Yallourn) to the significant load centres around Melbourne and the Portland aluminium smelter.

The transmission network also includes a 220kV network around Melbourne, three 220kV rings in rural Victoria including connection to hydro electric generators in the Victorian Alps (i.e. West Kiewa and Dartmouth), and interconnections to neighbouring states.

The network is centrally located among Australia's five eastern states that form the NEM, providing key connections between South Australia, New South Wales and Tasmania's electricity transmission networks.

The NEM interconnections include:

- Two 330 kV lines from Dederang Terminal Station to the Murray Switching Station (NSW);
- One 330 kV line from Wodonga Terminal Station to Jindera Substation (NSW);
- One 220 kV line from Red Cliffs Terminal Station to Buronga Substation (NSW);
- Two 275 kV lines from Heywood Terminal Station to South-East Substation (SA);
- Murraylink, which is a 300 kV DC link from Red Cliffs Terminal Station to Berri (SA); and
- Basslink which is a 400 kV DC link to from Loy Yang to Bell Bay (TAS).

3.2. Asset Summary

Table 1 summarises the volumes of major assets in the network.

Table 1: Asset Categories and Quantities[4]

ASSET CATEGORY	TOTAL
Transmission Towers	13,180
Conductors (km)	13,941
Cables (km)	9
Switchbays (Circuit breakers, Isolators/Earth Switch, Instrument transformers and GIS modules)	8,738
Power Transformers	161
Reactive Plant	391
SCADA, Network Control and Protection Systems	26,476

[4] As at July 2024 RIN Response

4. Organisational Context

4.1. Industry and Operating Environment

4.1.1. Regulatory Framework

The overall National Regulatory Framework and key responsibilities of each regulator are detailed in AMS 01-12 Asset Management System Manual. The Victorian transmission network is subject to economic and technical regulation, which is the responsibility of the AER and Energy Safe Victoria respectively. Table 2 summarises the key regulators and their responsibilities specific to the transmission network.

Table 2: Key regulators and their responsibilities

Regulator	Description
Australian Energy Regulator	The AER is responsible for regulation of industry participants in accordance with the National Electricity Rules including regulating revenues of the transmission network service providers. Regulatory proposals (i.e. revenue applications) to the AER are assessed against, amongst other things, the operating expenditure objective and capital expenditure objective (clauses 6A.6.6 (a) and 6A.6.7 (a) of the Rules). Accordingly, network businesses are required to submit the total forecast operating expenditure and capital expenditure. The applicable criteria for the expenditure forecasts are to: • Meet or manage the expected demand for prescribed transmission services over that period; • Comply with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services; • Maintain the quality, reliability and security of supply of prescribed transmission services and the transmission system; and • Contribute to achieving emissions reduction targets through the supply of prescribed transmission services.
Australian Department of Home Affairs	Responsible for regulatory oversight of the implementation of the Security of Critical Infrastructure (SOCI) Act 2018.
Australian Energy Market Operator	AEMO is the national electricity market operator and its operational responsibilities are exercised in conjunction with AusNet's operations functions AEMO also has planning oversight of the NEM transmission system and is responsible for producing the Integrated System Plan (ISP) which sets out the development pathway for national transmission flows based various transition scenarios and Government policies. Practically, this focusses on interstate transmission upgrades such as WRL and VNI West.
Energy Safe Victoria	Technical and safety regulator responsible for the safe generation, supply and use of electricity, gas and pipelines in Victoria From time to time, Energy Safe Victoria may issue directives to give effect to the objectives of the Electricity Safety Act 1998

Regulator	Description
	The Electricity Safety Act also requires major electricity companies to submit to the Energy Safe Victoria 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 10-01 Electricity Safety Management Scheme.
Essential Services Commission	Responsible for Victorian electricity regulatory instruments including the power to modify them. It is responsible for administering and enforcing the Victorian energy licensing regime and the Landholder Access Code of Practice.
Environmental Protection Authority	Responsible for enforcing environmental protection laws and ensuring that AusNet complies with environmental standards
VicGrid	Uniquely in the NEM, VicGrid is responsible for planning and procuring bulk shared network services in Victoria including non-network and system security services. This procurement can be through contestable or non-contestable processes. VicGrid through the Victorian Transmission Investment Framework (VTIF) is also responsible for planning and development of Renewable Energy Zones (REZs), new connections to offshore wind resources and major infrastructure upgrades. These are outlined in the Victorian Transmission plan (VTP) and Victorian Annual Planning Report (VAPR).

4.1.2. Victorian Planning Framework

Responsibility for planning of transmission network services in Victoria is shared by the following three parties:

- VicGrid is responsible for planning the shared network and procuring network support and shared network augmentations;
- The asset owners, AusNet and other transmission network owners; and
- The transmission customers (distribution companies, generation companies and directly connected customers) which are responsible for planning and directing the augmentation of their respective transmission connection facilities.

In Victoria, the transmission network planning functions are separated from the functions of ownership and operation. This section summarises the planning roles of the various parties in Victoria. These arrangements differ from other states in Australia, where planning and responsibility for augmentation is integrated with the incumbent transmission company (although independent planning oversight occurs in South Australia). The relationships between these parties and the Regulators are shown in Figure 3.

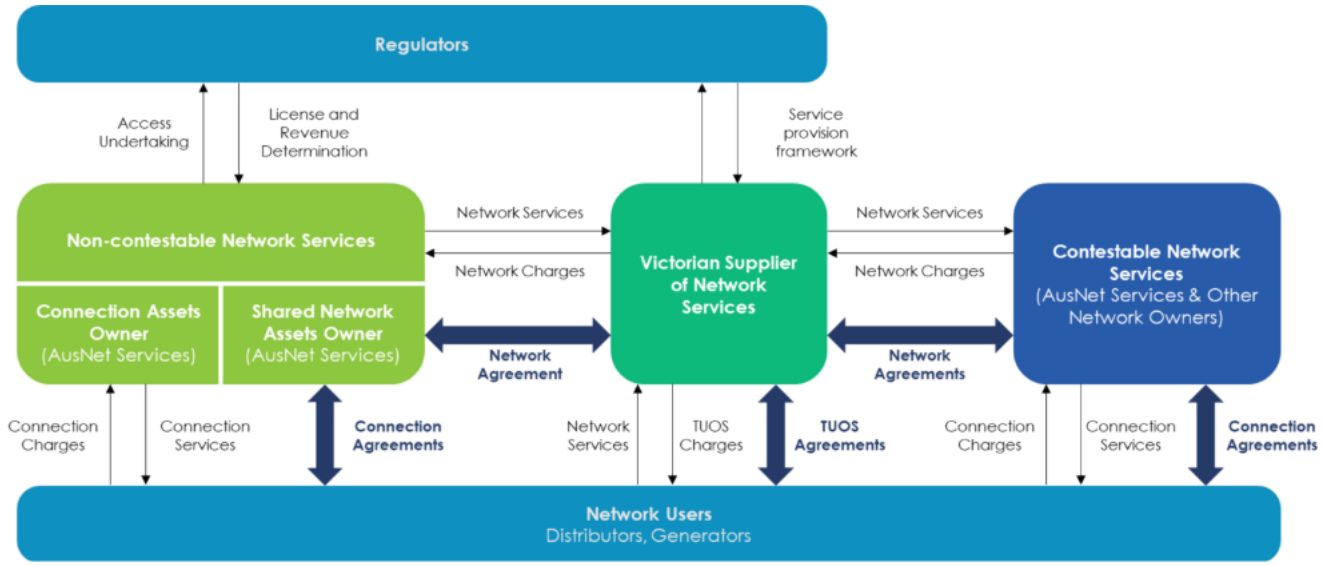

Figure 3: Regulatory and Commercial relationships

In early 2021, the Victorian Government announced the formation of a new entity, VicGrid, tasked with coordinating the overarching planning and development of Victorian REZ areas. Concurrently, the Victorian Government reformed the way transmission is planned and developed in Victoria through the Victorian Transmission Investment Framework (VTIF). The Legislative transfer of Victorian transmission planning powers to VicGrid occurred on 1 November 2025.

The responsibilities of the parties within the Victorian structure for electricity supply are set out in Victorian legislation, the licences, guidelines and codes administered by the Essential Services Commission and Victorian derogations in Chapter 9 of the National Electricity Rules (NER). Together these describe the Victorian model for procurement and provision of transmission services in Victoria.

4.1.2.1. VicGrid

VicGrid is responsible for transforming Victoria's energy grid, focusing on the integration of renewable energy sources to deliver reliable electricity to homes and businesses statewide. VicGrid's core responsibilities encompass comprehensive planning, development, and coordination of transmission infrastructure, with a clear commitment to ensuring safe, dependable, and affordable power for all Victorians. Importantly, VicGrid is actively engaging host communities, offering opportunities for participation and ensuring they share in the benefits of Victoria's energy transition.

- Coordinating the planning and development of Renewable Energy Zones (REZs) to support the growth of clean energy across the state.
- Investing in targeted projects designed to strengthen and modernise Victoria's electricity grid, making it fit for the future.
- Connecting developers of new load, storage and generation to the Victorian shared network, including managing new access control schemes to the new REZs.
- Adopting a new, inclusive approach to transmission planning and development through the Victorian Transmission Investment Framework, ensuring the benefits of upgrades are shared by all Victorians.
- Leading the delivery of transmission infrastructure needed to connect new offshore wind resources to the state's electricity network.
- Collaborating with the Australian Energy Market Operator (AEMO) to deliver major upgrades and enhancements to Victoria's energy infrastructure.
- Providing clear, accessible information to local communities, and creating pathways for community involvement in major energy projects.

Each year, VicGrid publishes the Victorian Annual Planning Report (VAPR) assessing the performance of the Victorian transmission network, identifying emerging limitations and investment opportunities.

4.1.2.2. Connected Parties

In Victoria, connected parties are responsible for the planning and augmentation of their connection assets. The five distribution businesses (DBs) have responsibility for planning and directing the augmentation of those facilities that

connect their distribution systems to the shared transmission network. DBs plan and direct augmentation in a way that minimises costs to customers, taking into account the consequence of an asset failure, the likelihood of it occurring and the cost to augment the connection station. Other connected parties (major consumers or generators) are responsible for their own connection planning. They can choose to delegate this task to a DB if they wish.

In the event that a new connection or augmentation of an existing connection is required the connected parties must joint plan with and meet the reasonable technical requirements of VicGrid, AusNet and other effected parties.

Each year, the DBs publish the Transmission Connection Planning Report (TCPR) that assesses network planning criteria, the risks of lost load and options for meeting forecast demand at connection points.

4.1.3. Integrated System Plan (ISP)

Australia's National Electricity Rules require AEMO to produce a plan every two years for essential infrastructure that will meet future energy needs. This is known as the Integrated System Plan (ISP) which is a whole-of-system plan that provides an integrated roadmap for the efficient development of the NEM over the next 20 years and beyond. It does so by drawing on extensive stakeholder engagement as well as internal and external industry and power system expertise.

The ISP's optimal development path (ODP) sets out the needed generation, storage and network investments in the NEM to transition to net zero by 2050 through current policy settings and deliver significant net market benefits for consumers. The key observations in the 2024 ISP are:

2024 ISP is an actionable roadmap for eastern Australia's power system to optimise consumer benefits through a transition period of great complexity and uncertainty. The Rule changes put the ISP in place to shift the responsibility for transmission network planning further towards AEMO for all jurisdictions to ensure that the least cost combination of projects will be delivered across the NEM rather than a state based piecemeal approach to planning that currently exists. The key observations in the 2024 ISP are:

- Renewable energy, connected by transmission and distribution, firmed with storage and backed up by gas-powered generation, is the lowest-cost way to supply electricity as Australia transitions to a net zero economy;
- The ODP, which is the lowest-cost path to meet emissions reductions, has an annualised capital cost of $122 billion to 2050;
- Seven additional transmission projects have been progressed to 'actionable' status since the 2022 ISP
- Investment in transmission projects will reduce costs for consumers
- Many households and businesses are shaping their own energy futures by investing in solar, batteries and electric vehicles.

Next steps to advance the ODP include advancing the 2026 ISP and advancing projects along the ODP. The 2026 ISP is expected to be published in June 2026.

4.1.4. Renewable Energy Zone Development Plan

In February 2021, the Victorian Government began consultation on a Renewable Energy Zone Development Plan (RDP) created to support the $1.6 billion energy fund announced in the November 2020 Budget. The initial consultation paper set out proposed generation and transmission network investments supporting the Victorian Government Climate Change Strategy commitment to reduce carbon emissions by 45-50% by 2030 and net zero by 2050.

Where necessary, network solutions identified in the RDP may extend beyond initiatives in current planning documents produced by AEMO such as the Integrated System Plan (ISP) and Victorian Annual Planning Report (VAPR). In particular, the RDP will improve system strength and alleviate immediate connection and curtailment constraints in the short term. It will also facilitate scale efficient and anticipatory investments to support the efficient development of renewables in the medium term forward.

Projects are divided into the following categories

- Immediate Priority Projects (Stage 1) – These projects have been identified based on key criteria (e.g. delivered by 2025, present or projected need, standalone benefits, no long-term dependencies, can meet planning req.)
    1. Cat 1: Immediate Network Investments via REZ Fund financing
    2. Cat 2: Larger Network Augmentations with alternative delivery options

Future projects to support REZs over the medium term (Stage 2) – Projects that require further technical, economic and delivery model analysis, and consultation. These will be reconsidered under Vic Grid's Victorian Transmission Plan.

The projects under the RDP Stage 1 are shown in **Error! Reference source not found.**.

Table 3: RDP Stage 1 Projects

PROJECT	EXPECTED COMPLETION DATE	STATUS
Ballarat Terminal Station – Terang Terminal Station – Moorabool Terminal Station thermal loading control scheme	14/02/2024	Completed
Heywood Terminal Station – Moorabool Terminal Station uprating (substation / auxiliary upgrade and dynamic line rating)	15/05/2025	Completed
Sydenham Terminal Station – Keilor Terminal Station line uprating (station upgrade)	14/12/2023	Completed
Moorabool Terminal Station 220 kV transformer (station upgrade)	06/12/2023	Completed
Red Cliffs Terminal Station – Kiamal Terminal Station – Murra Warra Terminal Station – Horsham Terminal Station – Bulgana Terminal Station thermal loading control scheme	31/10/2025	Completed
Red Cliffs Terminal Station – Kiamal Terminal Station – Murra Warra Terminal Station – Horsham Terminal Station – Bulgana Terminal Station MurrayLink runback control scheme for MurrayLink import	30/10/2024	Completed
Ararat Terminal Station, Waubra Terminal Station, Ballarat Terminal Station, Bulgana Terminal Station, Kiamal Terminal Station interplant upgrades	08/11/2025	Commissioning
Dederang Terminal Station 330 / 220 kV transformer (secondary cooling system)	04/09/2024	Completed
Dederang Terminal Station– Glenrowan Terminal Station – Shepparton Terminal Station – Bendigo Terminal Station line thermal loading control scheme. Axedale SF Runback Scheme.	N/A	On Hold by AEMO

4.1.5. Victorian Transmission Plan (VTP)

The 2025 VTP is the first Transmission Plan by VicGrid, released on 7 Aug 2025, that outlines the new Victorian REZs and transmission projects required over next 15 years, to transition Victoria to clean, affordable and reliable electricity.

It will be updated regularly, with next VTP in 2027, then every four years. The VTP and all regulated network plans, including AEMO's ISP, are required to consider impact of each other's project and planning decisions.

Post the final VTP, VicGrid will progress priority transmission projects required within first 10 years to detailed assessment and optioneering, delivery cases and then procurement. Subsequently, the Victorian Energy Minister will declare proposed REZs which will initiate public consultations on key features for each REZ (like boundaries, transmission corridors, access arrangements and proponent engagement requirements).

Key outcomes of the 2025 VTP are:

- By 2040, VTP will support new grid-scale Victorian generation of 17.0 GW (comprising of onshore wind 5.8, utility solar 2.2, offshore wind 9.0) and utility storage of 4.8 GW, under VTP's central scenario
- Six new REZs that supersede the existing REZs identified in AEMO's 2024 ISP, and has a total footprint of 7.9% of land in Victoria
- Seven Transmission Programs across Victoria (~$7.9B, real FY25), involving 20 new projects (two of which are already identified within AusNet Repex program). The Programs involve upgrade of 430km of existing lines; build of 380km of new lines; and assortment of transformer and in-station upgrades.

The VTP is an extremely ambitious plan to develop the Victorian transmission network, with four major line rebuilds; multiple metro station works; a new Truganina station, and four major new line builds. In addition to addressing coal

fully retiring in Victoria, the VTP secures necessary major investment in western Melbourne, and associated line capacity upgrades, that supports the known strong pipeline of Data Centre interest in that region. Lastly, the VTP has identified a further 9 additional projects under an alternative candidate path, that can be used to deploy more onshore REZ capacity (+11GW) – should transition uncertainties with offshore wind or increased large industrial load crystallise.

Further information on the seven Transmission Programs is provided in **Error! Reference source not found.**, Figure 4, Figure 5 and below:

- Eastern Vic: From 2028-2030, 5 projects to support offshore wind to Melbourne
- Western Vic: From 2028-2030, 5 projects to support flows from North and South-West REZs into Melbourne
- North-West: By 2035, 2 major rebuilds to unlock new REZs in region
- South-West: By 2033, 4 projects to unlock South-west REZ and new western power flows into Melbourne
- Gippsland: From 2033-2038, one new radial line/loop in two stages to support offshore wind, along with the new Gippsland line being developed
- Latrobe Valley: From 2034-35, 2 projects to accommodate new flows with coal retiring and incoming offshore wind
- Offshore Wind: By 2038, one minor line uprate at Portland to accommodate Southern Ocean offshore wind

Table 4: Final 2025 VTP Projects

Western Victoria Reinforcement Program (2028-2030)

- 1.1 Increase rating Moorabool to Geelong 220kV circuit (2028)
- 1.2 Replace H1 and H2 South Morang 330/220kV transformers (2030)
- 1.3 Rebuild Ballarat to Moorabool line into 220kV double circuit (2030)
- 1.4 Switch existing Geelong to Keilor circuits at Deer Park (2029)
- 1.5 1000MVA replacement of 500/220kV transformers at Keilor (2030)

Eastern Victoria Reinforcement Program (2028-2030)

- 2.1 Install second Hazelwood to Yallourn double circuit line (2028)
- 2.2 Install second 500/220kV transformer at Cranbourne; tie in existing Hazelwood-Rowville 500kV circuit at Cranbourne (2030)
- 2.3 Load mgmt. works on 220kV circuit from Rowville-Templestowe-Thomastown, and Rowville-Ringwood-Thomastown (2028)
- 2.4 Fault level mitigation at Keilor, Rowville, South Morang, Thomastown and Templestowe buses (2028)
- 2.5 Increase rating of existing Mount Beauty-Dederang and Mount Beauty-Eildon lines (2029)

North West Strengthening Program (2035)

- 3.1 Replace Murra Warra-Horsham-Ballarat line with double circuit (2035)
- 3.2 Rebuild Kerang-Bendigo as double circuit (2035)

South West Expansion Program (2033)

- 4.1 New 500/220kV terminal station at Truganina; two 220kV lines from Truganina to Deer Park (2033)
- 4.2 New 500kV Tarrone-Mortlake-Moorabool double circuit and Tarrone 500kV turn in (2033)
- 4.3 New 500kV Moorabool-Truganina double circuit; Truganina-Sydenham single circuit (2033)
- 4.4 Rebuild existing 3 Deer Park-Keilor lines as double circuits (2033)

Gippsland Offshore Wind Transmission Stage 2 Program (2033/2038)

- 5.1 Second Gippsland 500kV double circuit radial line and tie-in loop (Phase 1: 2033; Phase 2: 2038)

Latrobe Valley Strengthening Program (2034/2035)

- 6.1 Hazelwood power flow controllers (2034)
- 6.2 Additional transformer at Cranbourne/Rowville (2035)

Offshore Wind Upgrade (2038)

- 7.1 Uprate Portland-Heywood 500kV double circuit lines (2038)

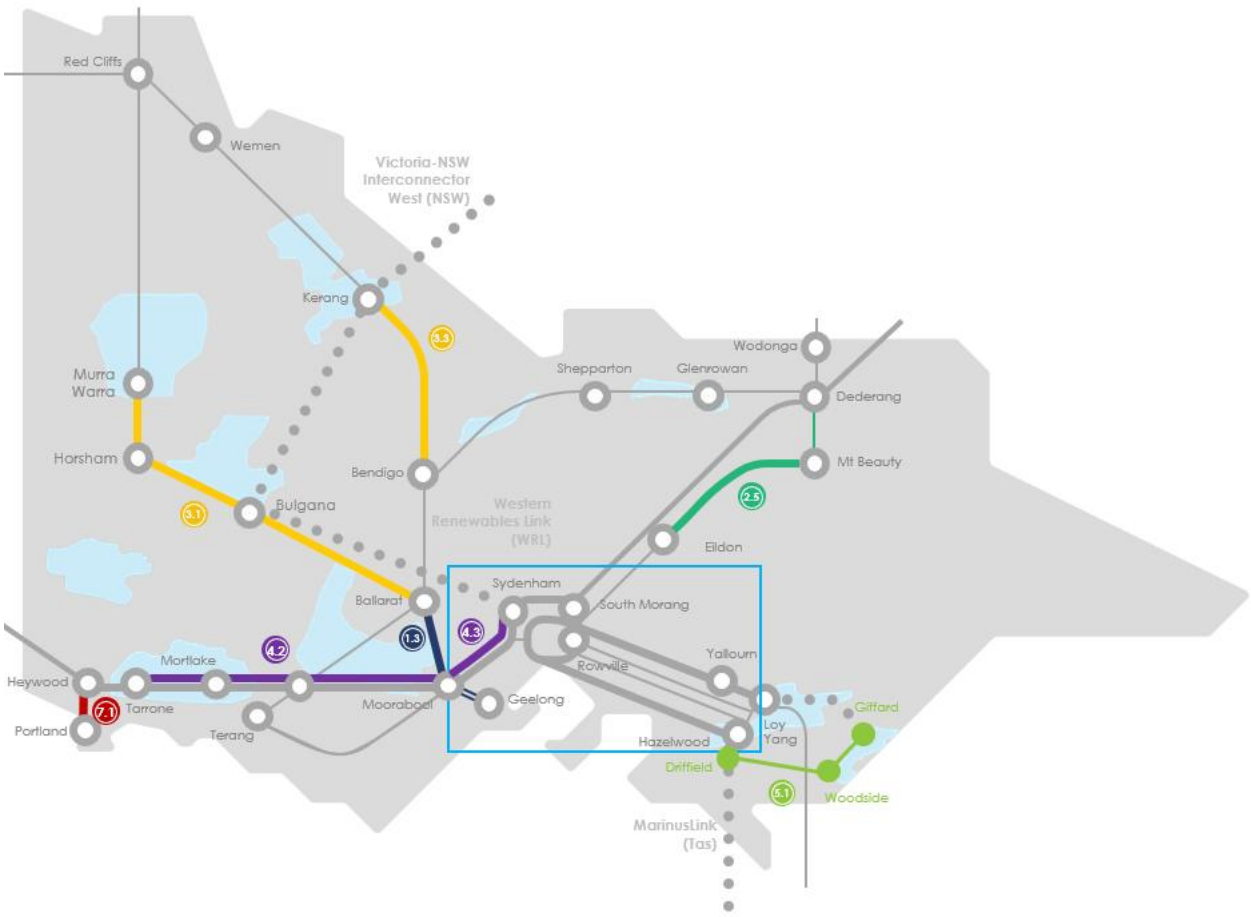

Figure 4: VTP Transmission network in Victoria

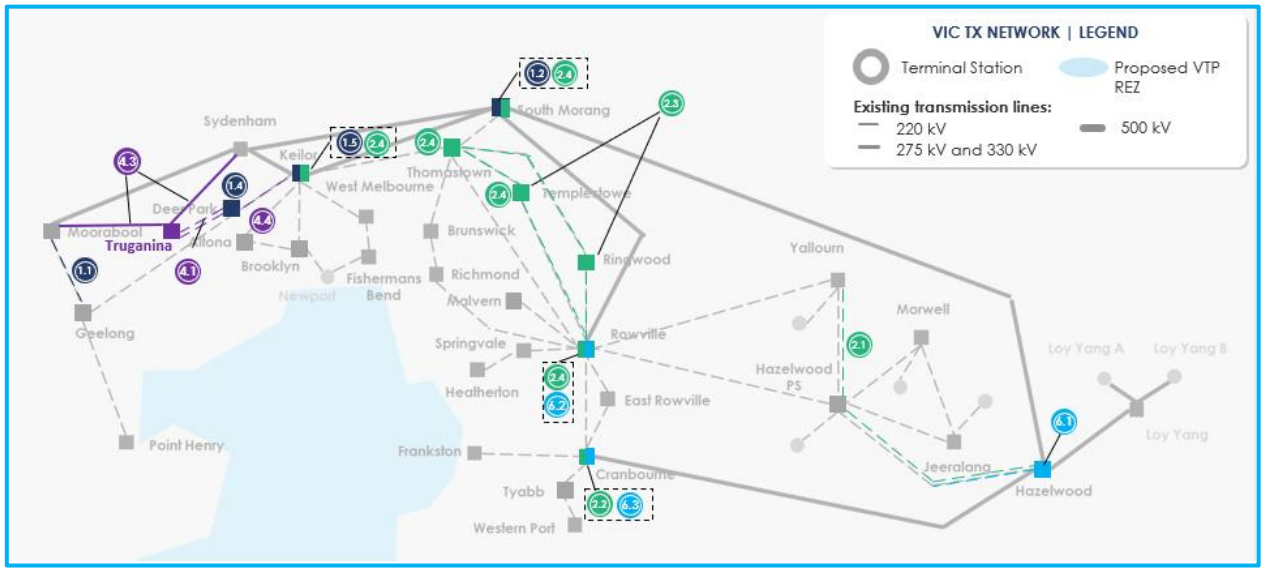

Figure 5: VTP transmission network around Melbourne

4.1.6. Changing Function of the Transmission Network

The role of the transmission network in Victoria is evolving rapidly, driven by the continued growth of renewables, distributed energy resources, and increased demand from emerging industries such as data centres. These changes have brought about a range of new complexities and challenges for AusNet, including:

- Greater complexity in protection, communications, and control systems: The integration of diverse energy sources and technologies has made it necessary to upgrade and adapt existing schemes to maintain network reliability and security.
- Rising load on certain transmission lines and stations: Specific network segments are experiencing higher usage, requiring targeted investment and management to prevent bottlenecks and ensure efficient power delivery.
- Fluctuating demand patterns: The network faces both decreasing minimum demand and increasing maximum demand, necessitating improved forecasting and flexible operational strategies.
- Power quality management: Maintaining voltage and frequency stability is increasingly challenging due to the variable nature of new generation sources and loads.
- Outage and maintenance impacts: The type and location of new connections affect how and when maintenance can be safely carried out, sometimes limiting accessibility and increasing operational risk.
- Changing criticality of network areas: As new generation sources and industrial loads emerge, the importance of certain network segments shifts, requiring ongoing reassessment of priorities and resources including system black start pathways and procedures.
- System strength challenges: Regions with high penetration of inverter-based resources such as wind, solar, and batteries face reduced fault current levels and potential grid instability, prompting the need for innovative approaches to maintain system strength.
- Network congestion and constrained conditions: Increased generation or demand in certain areas can create congestion, limiting the ability to efficiently transfer power and requiring advanced management strategies.
- Oscillatory and transient stability concerns: The integration of new technologies can introduce low-frequency power oscillations and make the system more vulnerable during disturbances, emphasising the need for robust stability management.
- Voltage stability and control: Evolving generation mixes and demand profiles call for enhanced voltage regulation and control measures.
- Coordination of distributed resources and demand response: To ensure reliable operation, there is a growing need to synchronise distributed energy resources and actively manage demand response initiatives.
- Integration of advanced technologies: The adoption of new digital solutions and automation requires the development of updated operational and planning methodologies.
- Cybersecurity risks: As the network incorporates more remotely controlled and digital assets, safeguarding against cyber threats becomes increasingly critical.

AusNet remains committed to deepening its understanding of the needs of both existing and prospective generators and loads. By fostering strong relationships and providing clear guidance, AusNet aims to support investment decisions and facilitate timely and efficient connections to the transmission network, helping to ensure a secure, reliable, and future-ready electricity supply for Victoria.

4.1.7. Growth in New Connections

There are four types of customer connections to the transmission network:

1. Generators and batteries;
2. Interstate connections;
3. Industrial customers and data centres; and
4. Distribution business connections.

AusNet charges customers for the use of connection assets. Connection assets are those assets that are dedicated to the connection of the generators, storage, interstate networks, industrial customers and distributors to the transmission network. In some cases, the connection assets are owned by the customer. Where this is the case, AusNet is not responsible for the management of the connection assets.

The number of generator connections continue to grow due to an increasing number of generation sources, mainly wind farms, solar and battery connections. Additionally, industrial customer and distribution business connection interest have grown as a result of increasing large data centre developments and interest. The volume of connection applications and enquiries has continued to increase and is expected to remain at elevated levels.

The new inverter-based (wind, solar, battery) generation along with the increasing interest in large inverter-based loads significantly change the dynamics of the power system. Additionally, moving from transporting coal fired baseload generation from the Latrobe Valley to generation spread across the State also comes with new challenges.

4.1.8. Emerging system strength challenges

System strength is described as the ability of the system to maintain and control the voltage waveform at any given location in the power system, both during steady state operation and following a disturbance. System strength is important to maintain normal power system operation, dynamically respond to disturbances and return the power system quickly to stable operating conditions after the disturbance.

System strength has historically been supplied as a by-product of synchronous generators (i.e. coal and gas fired generators). Increasingly, changes in generation mix towards non-synchronous generation (i.e. renewable energy sources) can reduce system strength.

Synchronous machines can be operated to provide system strength. However, deteriorating economics for these machines and the uncertainty on where future system strength will be located continues to create planning challenges. This is further exacerbated by changes in demand and consumption, with a forecasted decrease in minimum demand.

This results in emerging system strength challenges and issues affecting the security of the transmission network. Lower system strength increases the risk of network instability, system black and loss of supply of the network. Further closures of coal-fired power stations continue to concentrate the risk of network instability and will be a continuing trend as all Victorian brown coal is expected to retire by 2035.

Access to the system for maintenance and replacement in the form of planned outages is becoming increasingly difficult to obtain as well as the length of outage duration and emergency outage recall requirements due to system strength requirements in Victoria and South Australia.

AusNet's asset management and operations must continue to adapt to operate in this environment including through encouraging network augmentation, planning around market impacts and network constraints and planning for live line work capability.

4.1.9. Constraints to Planned Outages

Recent significant outages and generation shortfalls at certain times in the NEM have put electricity supply and reliability in the media spotlight, becoming a key political issue. This has led to increased scrutiny on AEMO's management of the network which has resulted in increased restrictions on our operational ability to switch the network for maintenance and project works. AEMO has published a summer guideline for planned outages on the transmission network that has significantly extended the period during which outages are restricted and has expanded the coverage to include all the 500 kV network and a significant proportion of the 220 kV network.

In addition, AusNet is subject to the Market Impact Component (MIC) incentive scheme, known internally as Market Impact Parameter (MIP), which imposes significant costs on the business if planned outages impact generation to the point that market price for electricity is impacted. This scheme will be removed from April 2027.

These restrictions can result in:

- Outages being cancelled at last minute
- Planned maintenance being postponed due to being unable to get an outage
- The need to plan maintenance years in advance and group activities to minimise the number and duration of outages

The tight balance between supply and demand in Victoria as well as the closure of the Hazelwood Power Station has changed the load flows and criticality of certain network elements resulting in changes to how the network is managed operationally and how assets are managed. One change is the renewed focus on incident response in the event of an asset failure or an outage event.

This focus has led to the development of risk themes for the network resilience activities under which controls are developed for individual risks and an action plan developed. Risk themes include:

- Supply, Demand and Planning
- Assets
- Stakeholder and Communications
- Incident Management
- Our People

4.1.10. Changes to energy consumption patterns

Although there has been significant growth driven by population increases, economic activity, new industrial loads such as data centres, and the electrification of heating and transport, AEMO's annual demand forecasts indicate considerable uncertainty regarding future changes in the load profile.

4.1.10.1. AEMO Maximum and Minimum Demand Forecast for Victoria

AEMO provides Electricity Forecasting Insights annually as independent electricity consumption and maximum and minimum demand forecasts over a 30-year outlook period for the NEM. These are published within the NEM Electricity Statement of Opportunities (ESOO).

The annual consumption in Victoria is forecasted to increase but at a slower pace. Factors resulting in the increase includes new industrial loads (data centres), greater electrification of homes, businesses and transport, alongside greater uptake of EVs. Figure 6shows the annual consumption in Victoria in TWh for the 2023, 2024 and 2025 ESOO forecasts.

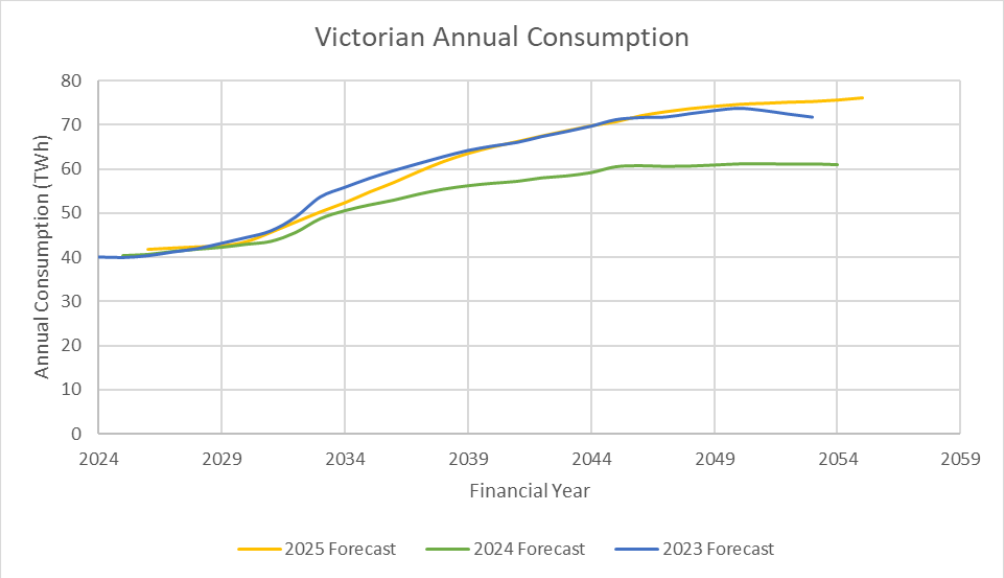

Figure 6: Victorian Annual Consumption[5]

The maximum demand in Victoria, similar to the annual consumption, is forecast to grow but at a slower pace than forecast previously. Figure 7 shows the maximum demand forecasts over the five years.

[5] AEMO 2025 ESOO

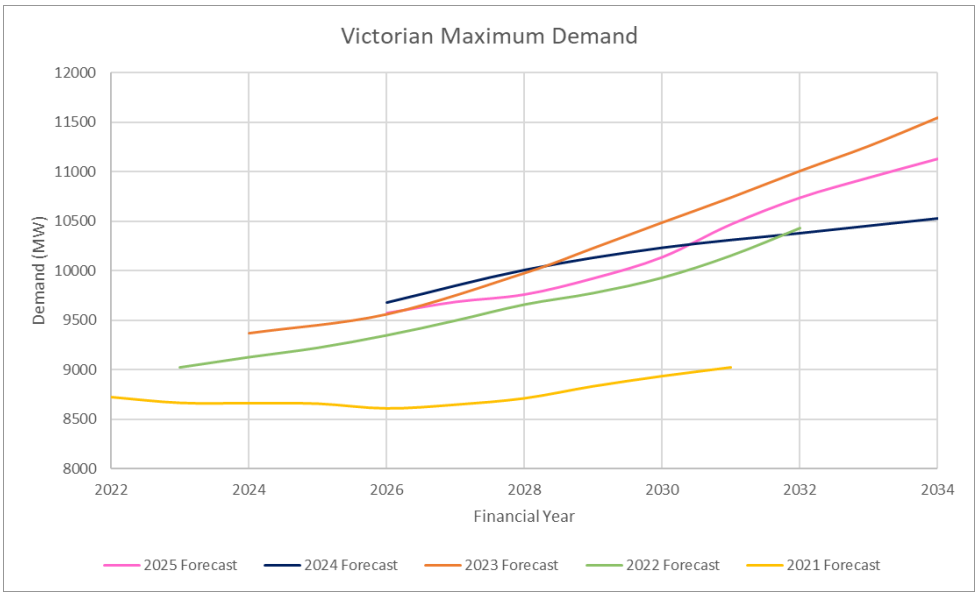

Figure 7: Victorian Maximum Demand Forecasts in MWError! Bookmark not defined.

Historically, the market has been focused on high operational demand but in recent times there is greater focus on minimum demand, shown in Figure 8, which is linked to the growth of distributed photovoltaic capacity with the period of minimum demand occurring during daytime hours with impacts especially occurring in autumn and spring low load periods.

The impact of lower minimum demand and excess generation presents new risks to the transmission network including overvoltage concerns on lightly loaded transmission lines, system strength challenges as base load generation is run down to a minimum number of units online, and operational limit challenges resulting from interstate export limits during minimum demand periods.

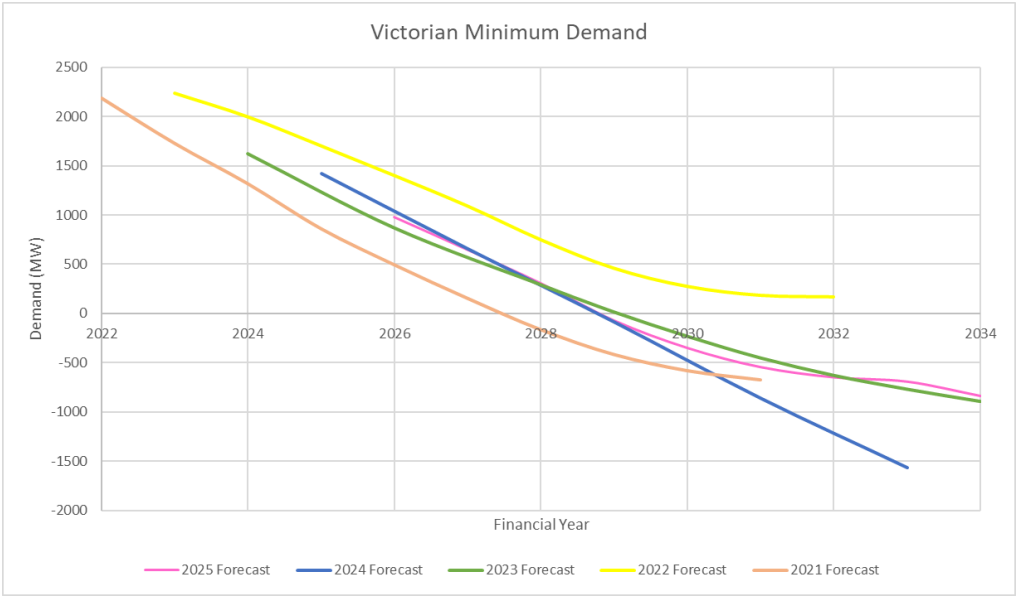

Figure 8: Victorian Minimum Demand in MWError! Bookmark not defined.

4.1.10.2. AEMO connection point forecasting

The demand forecast by AEMO varies significantly at different connection points, suggesting that whilst the overall network demand forecast is for gradual growth over the same period, individual stations will have different requirements for investment.

Population growth is seen as the key driver in consumer demand, which in most cases is offset by increased building and energy efficiency and installation of PV systems.

Network augmentation investments are driven by growth in electricity consumption and demand (including from electrification and Data Centres), new generation connections and rising fault levels. New drivers for augmentation will emerge in the future which may include reactive support, increased control, protection and communication infrastructure, and other measures to strengthen the 'robustness' of the network to accommodate new levels and locations for renewable generation. AEMO is responsible for the planning and justification of transmission network augmentation projects.

AusNet will bear the risk if planning decisions are not made in a timely and responsive manner, thus AusNet aims to build on our 'close' and 'partnering' relationship with AEMO and VicGrid to ensure that we actively influence and drive timely planning decisions, drive a more co-ordinated planning approach and assess the opportunity and risk of our role extending to full transmission planning.

4.1.11. Regulatory Investment Test Rule

From 1 August 2010, TNSPs must apply the Regulatory Investment Test – Transmission (RIT-T) in accordance with clause 5.16.4 of the Electricity Rules to assess the economic efficiency of proposed investment options. The RIT-T is intended to promote efficient transmission investment in the NEM and ensure greater consistency, transparency and predictability in transmission investment decision making.

- RIT submissions are required for all projects greater than a cost threshold of $8[6] million with the AusNet asset replacement end-to-end process ranging from 9 to 18 months. Most transmission projects and programs exceed this threshold. The RIT-T process generally requires the following three stages (with exceptions[7]): Stage one: Project specification consultation report (PSCR)
- Stage two: Project assessment draft report (PADR)
- Stage three: Project assessment conclusions report (PACR)

We expect projects over $54 million to take 12 to 18 months as the PADR document becomes mandatory. A project under $10 million is likely to be around 9 months as the PADR is less likely to be required.

To ensure that RIT-T submissions are undertaken in a timely and efficient manner AusNet has employed a Market Modeller and engages consultants as required to support our in-house Network Planners and Engineers. These teams perform the analysis that underpins the development of the RIT-T documentation (i.e. PSCR, PADR & PACR) that are published in accordance with the NER. These published documents are available for consultation by interested stakeholders (inclusive of customers) to comment on the proposed investment options and any non-network options.

[6] RIT-T thresholds are effective as at 1 Jan 2025

[7] The PADR is exempted if the estimated capital cost of preferred investment option is less than $54M; no material benefits beyond load curtailment or shedding; and no submissions received to PSCR identifying additional credible options delivering a material market benefit

4.2. AusNet Context

4.2.1. Corporate Strategy

AusNet's corporate strategy is depicted in Figure 9**Error! Reference source not found.**. Further information on the strategy can be found here.

Figure 9: AusNet's Corporate Strategy

4.2.2. Safety Vision

AusNet's safety vision is:

Safety is a key value and our way of life at AusNet. We work together safely and protect and respect our community and our people. At AusNet, our overarching priority is the safety and wellbeing of our people.

Our safety vision is symbolised by the simple expression:

Workplace injuries have a significant impact on our business, and more importantly impact on our lives. When it comes to the safety of our people, contractors and visitors, zero injury is the only acceptable target. We will not compromise on safety, and we will not tolerate unsafe acts and behaviours.

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

To achieve our safety vision, our mission must be to work together to implement a common strategy with unified purpose and consistency of attitude.

4.2.3. Customer Focus

To deliver on AusNet's Corporate strategy, one strategic priority is to generate trust and respect with customers and partners. Since 2015, the business has focussed on investing in customer service to minimise frontline customer effort and pain, recognising that this would provide a foundation for building trust. The development of the current Customer Service Index (CSI) reflected this need. Since its implementation, the CSI has been successful in driving a reduction in customer complaints and meeting current customer expectations of energy service delivery.

The next phase for AusNet involves examining approaches to develop a long-term relationship of trust. This entails providing effective customer service and creating a customer experience that is aligned with customer needs. To support this, the organisation will utilise an externally verifiable measure of Customer Satisfaction and incorporate it into Corporate KPIs. Recognising the role of organisational culture in fostering customer-focused thinking, there is ongoing work to further enhance customer experience capabilities. The intention is to design this experience for each of the three networks, taking into account that expectations regarding service offerings, service levels, and overall experience may differ between networks.

Our first step was to clearly define our customer as "the end consumer of our products and services". For Electricity and Gas Distribution, this is straightforward. In Transmission, although we focus on directly connected customers like Air Liquide and Alcoa, every Victorian ultimately relies on the Transmission network. Since services are mostly delivered via the Distribution network, being customer-centric in Transmission means also considering generators as key stakeholders. By ensuring a positive experience for generators, we support the whole energy supply chain and better serve our end customers. Thus, generators are central to our customer strategy.

4.2.4. Customer and Community Engagement

AusNet incorporates customer and stakeholder input into its business planning activities. AusNet's commitment to genuine and proactive stakeholder engagement and delivering for customers can be seen across all operations, including the approach to regulatory proposals, AusNet collaborates with stakeholders to ensure their perspectives are communicated to decision-makers and considered in business operations.

AusNet undertakes a range of business-as-usual engagement activities to maintain a current understanding of our customers' needs, attitudes and behaviours. These include:

- Quarterly meetings of the AusNet Transmission Stakeholder Advisory Panel (TSAP), comprising directly connected customers, customer advocates, distribution businesses, generators' advocates and landholder groups.
- Account management for many large commercial & industrial customers
- Extensive community engagement for commercial transmission projects, many learnings from which are useful for the regulated network
- Consultation with our Transmission Stakeholder Advisory Panel and Customer Consultative Committee (CCC) on key strategic issues

Like AusNet, the Australian Energy Regulator (AER) is putting an unprecedented focus on consumer engagement, ensuring the regulatory proposals they assess are based on a thorough understanding of stakeholder needs and preferences and deliver quality outcomes for customers. AusNet is currently completing the 2027-32 Transmission Revenue Reset (TRR) process, with the new regulatory period commencing on 1 April 2027. The planning for this involves extensive engagement with transmission customers, generation developers and stakeholders, including collaborative stakeholder workshops on a wide range of topics, stakeholder surveys, and one-on-one meetings with large customers, customer advocates (business and residential), relevant government agencies and the Australian Energy Market Operator (AEMO) and VicGrid.

The TRR engagement program will involve topics including resilience, Victorian Renewable Energy Zone (REZ) development, the Integrated System Plan (ISP) and Victorian Transmission Plan (VTP) and its impact on replacement programs, the impending closure of the Yallourn power station and its impact on the transmission network, incentive schemes, cyber security, insurance and many other topics. Some of these topics were suggested by AusNet for

discussion and some were suggested by stakeholders. AusNet strongly encouraged stakeholders to table relevant matters that they wanted to discuss or influence in the context of the TRR.

A key focus area is our ongoing engagement with landholders who host transmission infrastructure. This engagement is essential to the safe, reliable and sustainable operation of the network. As AusNet's project pipeline grows and we access properties more frequently to upgrade aging infrastructure and connect new renewable generation, we are strengthening our engagement efforts to deliver to the increasing volume and complexity of work. We are aware of the rising expectations from landholders and the broader community. The transition to renewable energy has increased public interest in energy infrastructure and we are continuously refining our engagement practices to reflect evolving expectations. Through our engagement we receive feedback from landholders and communities that help shape our approach that prioritises transparent, respectful and proactive communication.

4.2.5. Stakeholder expectations

AMS 10-05 Strategic Asset Management Plan details the key stakeholders and their expectations of AusNet. Table 5 summarises key stakeholders and their expectations of the service provided specifically by AusNet's transmission network.

Table 5: Energy network stakeholders and expectations

STAKEHOLDER	EXPECTATIONS
AEMO/VicGrid	• Joint planning • Compliance with Acts, Regulations and Codes • Transparent processes • Reliable information
Connected Parties **(energy consumers, electricity generators and gas producers, other network service providers)**	• Network access, including effective connection contracting • 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 and landholders	• Public safety • Reliable and secure energy supply • Environmental performance within Code • Minimal traffic disruptions • Protected infrastructure • Community consultation • Minimal disruption
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 • Security of critical infrastructure • 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 transmission network is reported to the AER in accordance with the specifications established in the Annual Information Orders (AIOs), Regulatory Accounts and Non-Financial Regulatory Accounts.

Weekly, monthly and annual reports are submitted to Energy Safe Victoria in accordance with the Electrical Safety Performance Reporting Guidelines.

5. Asset Management System

AusNet's Asset Management System is a set of complex processes and interactions to plan and control asset-related activities to realise value from our assets and satisfy the needs of the business and those of our customers and communities. The Asset Management Framework shown in **Error! Reference source not found.** provides a summary v iew of the key artefacts and processes that comprise the Asset Management System.

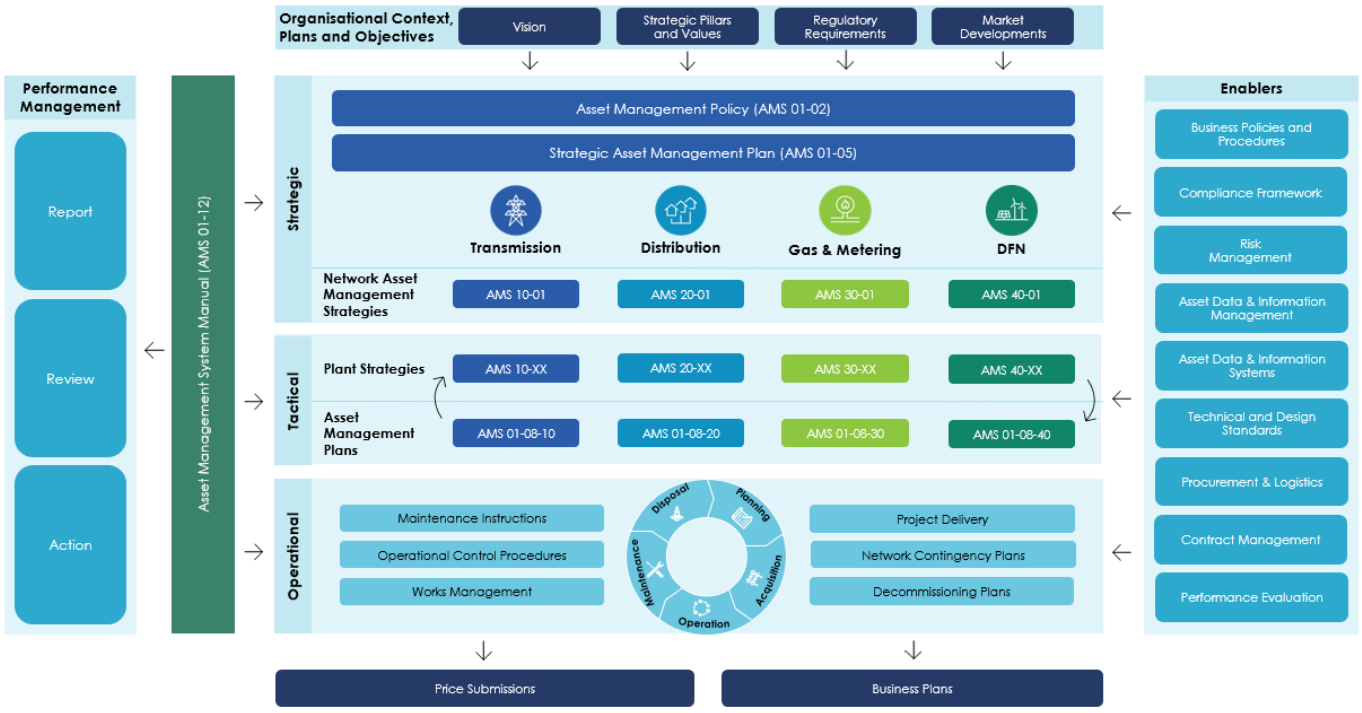

Figure 10: Asset Management Framework

AMS 01-12 Asset Management System Manual provides an overview of what AusNet's Asset Management System is and how it works.

5.1. Asset Management and Network Objectives

AMS 01-02 Asset Management Policy sets the foundation for all asset management decisions and has been formally endorsed by the CEO and communicated throughout the business. 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.

The Asset Management Objectives (AMOs) are detailed in AMS 01-05 Strategic Asset Management Plan. Transmission network objectives have been developed which translate the AMOs to the specific requirements of the Transmission network. The AMOs are shown in **Error! Reference source not found.**.

The CY25 performance measures for the transmission network objectives are detailed in Table 6**Error! Reference source not found.**.

Purpose: Connect communities with reliable, affordable and sustainable energy							
Vision: Trusted to bring the energy today and build a cleaner tomorrow							
Strategic Pillars						**Ambition**	
Safely deliver our customer's energy needs today				**Create the energy network of tomorrow**	**Enable the transition to a net zero future**	**Be a leader in asset management practice**	
Asset Management Objectives						**Enabling AMOs**	
Safety: Minimise risk to our people, contractors, customers and communities AFAP across our networks	**Reliability:** Meet the reliability expectations of our customers and communities, and meet our reliability targets	**Resilience:** Improve the resilience of our network to adapt to a changing climate and energy system environment	**Compliance:** Comply with all legislation, regulations, relevant standards and industry codes	**Planning and decision-making:** Deliver valued planning and network outcomes through optimising asset lifecycle management	**Sustainability:** Build stakeholder trust and deliver social value. Reduce our environmental impact. Operate efficiently to sustain financial value creation.	**Competency and capability:** Develop asset management capability and competency in the organisation	**Continuous improvement:** Continually improve asset management maturity for effective delivery of services

Figure 11: Asset Management Objectives

ASSET MANAGEMENT OBJECTIVES	TRANSMISSION NETWORK OBJECTIVES	PERFORMANCE MEASURES
Safety	Minimise risk across our network	• Acceptance of ESMS by Energy Safe Victoria • Formal safety assessments in ESMS reviewed annually • Effectiveness of ESMS confirmed by SAMC annual review • Asset management processes applied to security assets • Network equipment with a declared rating
Reliability	Meet reliability targets in a changing environment	• STPIS Service Component (unplanned) revenue
Resilience	Improve network resilience through appropriate planning	• Critical assets identified and failure response plans documented • Network Contingency Plan updated
Compliance	Monitor and meet our key compliance obligations	• Zero breaches of statutory asset and safety obligations • Information directions responded to on time • Clear visibility of compliance obligations status
Planning and decision-making	Advocate for Victoria's energy network of the future	• A right-sized transmission network to facilitate Victoria's energy transition to renewables
Sustainability	Enhance work practices and processes for delivery	• 3D design standards established • Project delivery model review completed
Competency and Capability	Uplift asset management capability	• Agreed design standards are published • Roadmap developed for reinstating key asset management documentation
Continuous Improvement	Improve maintenance effectiveness	• Clear visibility of asset condition and defect identification • Effective review of maintenance outcomes leading to timely interventions

Table 6: Transmission Network Objectives and Measures

6. 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.

6.1. Transmission Element Outage Risk

Table 7 is a summary of the key areas of the transmission network (in its current configuration) where an outage of a transmission element would have significant consequences. Workshops have been held by subject matter experts to determine ways in which to mitigate the identified risks.

Table 7: Critical Assets and Risks

Elements	Risk
1 Major Flow Paths Latrobe Valley to Melbourne Coal, gas, and Basslink connection to Melbourne	500 kV lines from Latrobe Valley to Melbourne and YPS-ROTS 220 kV lines supply the Melbourne metropolitan load. Loss of two HWTS-LYPS lines could lead to state-wide pre-contingent load shedding of up to 5700 MW. Latrobe Valley flow path provides power stability in Victoria.
2 VIC-South Australia Interconnector Sydenham to Moorabool to SA Alcoa Portland, Wind farms, and gas generation	Loss of any one line places SA and APD on single continency. Loss of next line may result in stability issues and significant impact on APD. New generation connections increase congestion and reduce stability.
3 VIC- New South Wales Interconnector South Morang to NSW Hydroelectricity and NSW support	Loss of two lines could lead to state-wide pre-contingency load shedding during peak times. Operational demands to be met require NSW imports to VIC during summer peaks and VIC exports to NSW during the minimum demands. Full operation of series capacitor banks for network support in the VIC-NSW flow path, system strength issues emerge when Snowy Hydro is not operating.
4 North Western 220 kV Ring Ballarat - Horsham - Mildura - Bendigo Solar and wind generation	System strength and voltage oscillation issues present, risk of over-voltage and voltage collapse. Constraints for generators and interconnectors to manage flows present in the ring. Loss of any one line places terminal station on single contingency. Loss of next line leads to loss of supply for large parts of rural Victoria.
5 Metro Connection Stations Supplying Melbourne	Asset failure may result in loss of supply for large parts of metropolitan Melbourne. Dependence on Newport and Laverton North generation for maintaining power system security.
6 Network Reactive Support Supporting Power System Security	Needed for voltage and reactive power control; affects import capability.
7 Generator Connections Ensuring network reliability will not limit supply	Critical for the availability of all power stations, particularly during high and low demands. Generator connection network outages constraining generation off may result in involuntary load shedding. Insufficient synchronous generators to support network during off-peak periods.
8 Black Start pathways Capability to restart after a major event	Ensure pathways are ready for service at all times. Black Start pathways need to be maintained as per AEMO System Restart Victoria operational procedures.

Error! Reference source not found. shows the critical elements of the Victorian transmission network.

To ensure visibility of the critical assets to staff a 'Network Importance' characteristic has been added to all functional locations and equipment within the EAM system (SAP) and an automated process to tag all work notifications, related to the critical assets, with a 'RESI' status. This facilitates better reporting and allows prioritisation rules that can be applied to the most important assets.

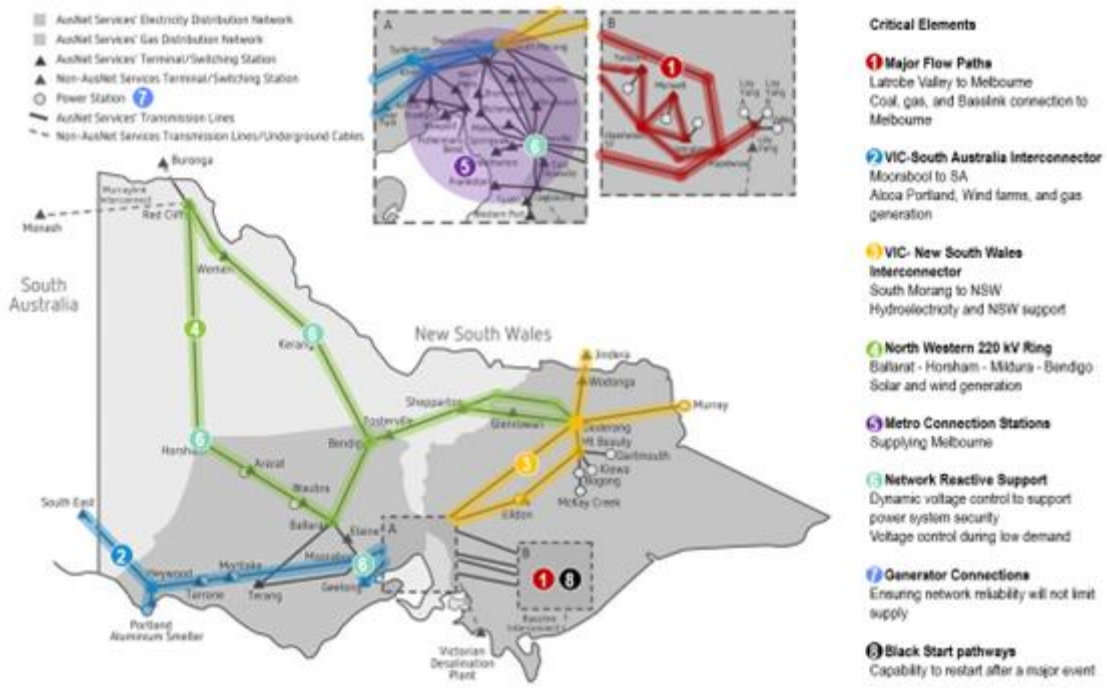

Figure 12: Critical elements of the Victorian transmission network

It is worth noting that the reasons for criticality are different in each case. For example:

1. The HWTS-LYPS lines are critical as they are part of the major flow path that connects generation from Loy Yang and Valley Power and the Basslink interconnector

1. The SA interconnector is critical to SA to meet demand and for network (voltage/frequency) support and supply to the large industrial load at Portland. Connection of new generation and associated protection and control schemes increase the complexity and operational risk on this network element.

2. The North-Western 220 kV ring is becoming more critical due to the expected large increase in renewable generation connections.

6.2. Connection Station Supply Risk

Connection station supply risk is a driver for asset management investment in the Transmission Network.

This risk in Victoria is documented in the Transmission Connection Planning Report (TCPR), which is a joint report on transmission connection planning, prepared by the five Victorian electricity distribution businesses. The report examines emerging limitations at each terminal station and proposes preferred network solutions, which are used as inputs to investment decision-making at terminal stations.

Based on the analysis of each terminal station, South Morang (SMTS), Cranbourne (CBTS), Terang (TGTS), Morwell (MWTS) and Altona West (ATS West) terminal stations were forecasted to have the highest annual supply risk in terms of weighted unserved energy value in MWh. The risk to reliability is quantified using the value of customer reliability (VCR) which is published by the AER.

6.3. Transmission Risks

AusNet operates a corporate Risk Management Framework based on ISO 31000 *Risk management – Guidelines* to assess a range of business, operational and asset related risks. Key risks are registered using AusNet's risk management

information system, Enablon. Enablon provides the monitoring and reporting capability to ensure these risks are managed in accordance with their priority level.

These risks are regularly reviewed and the actions required to manage them are implemented in specified timeframes. The registered risks that relate to the transmission network are summarised in Table 8.

Safety risks are also evaluated during ESMS development and updates, as detailed in ESMS 10-01.

Further information can be found in *RM 10-01 Risk Management Framework*.

Table 8: Transmission Network Related Risks

RISK REF #	RISK TITLE	ORGANISATIONAL UNIT	RESIDUAL RISK RATING	TARGET RISK RATING
RSK.58	Significant injury or fatality	HSEQ & Compliance	B	C
RSK.1047	Electrocution	HSEQ & Compliance	B	C
RSK.1050	Transport Incident	HSEQ & Compliance	B	C
RSK.1049	Explosive Asset Failure	HSEQ & Compliance	C	C
RSK.1789	Incorrect protection and control settings	Transmission	C	D
RSK.1790	Failure of ground wire in terminal stations	Transmission	C	D
RSK.1791	Hazards with aerial inspection of lines	Transmission	C	D
RSK.1792	Failure of conductors and insulators	Transmission	C	C
RSK.1793	Failure and/or structure collapse	Transmission	C	C

Bushfire risk primarily affects the distribution network, however it is also included in AusNet's risk assessments for the Transmission network, particularly in relation to vegetation management. Additional information can be found in section 8.4 on Environmental Management.

6.4. Security risks of Critical Infrastructure

As an owner and operator of Vital Critical Infrastructure, AusNet has a responsibility to ensure the physical protection of our assets to comply with the requirements of state and federal legislation such as the *Security of Critical Infrastructure Act 2018 (SOCI)* which is a driver if asset management investment decisions.

As per the requirements of the Act, AusNet has established and maintained a Critical Infrastructure Risk Management Program (CI-RMP) which identifies hazards that post material risks to the availability, integrity, reliability or confidentiality of the asset. The CI-RMP outlines mitigation measures where there is a material risk that could have a relevant impact on the asset, and as far as it is reasonably practicable to do so, minimise or eliminate any material risk.

The SOCI steering committee provides oversight, guidance and strategic direction in the development, implementation and maintenance of the CI-RMP, with the primary objective to ensure compliance with the SOCI Act. Additionally, AusNet's physical security standard (PRS10-18) outlines the minimum physical security control measures based on the criticality of AusNet's assets.

6.5. AER Benchmarking

Each year the AER conducts benchmarking of Australian Transmission Network Service Providers (TNSPs) using Regulatory Information Order (RIO) data supplied by each business.

This benchmarking attempts to give a comparison of productivity of each business by comparing Inputs (opex and capex) to outputs (line length, energy throughput, maximum demand, voltage-weighted sum of entry and exit points and reliability)

The 2024 report largely uses the same methods set out in previous reports with minor methodological changes to underlying basis for how the capital inputs are weighted. This has not presented any impacts on AusNet's performance.

All graphs in this section are taken from the AER's *Annual Benchmarking Report: Electricity transmission network service providers* November 2024.

Figure 13 is the multilateral total factor productivity (MTFP) which is the primary indicator used by the AER to measure and compare the efficiency of TNSPs. TNSPs represented in the chart are ElectraNet (ENT), Powerlink (PLK), AusNet (ANT), TasNetworks (TNT) and Transgrid (TRG).

AusNet's score is broadly consistent between 2021 to 2023, reflecting an improvement in productivity since 2019, going from ranking last on the list, to second. Between 2022 and 2023, there was a slightly decrease of 1.3%

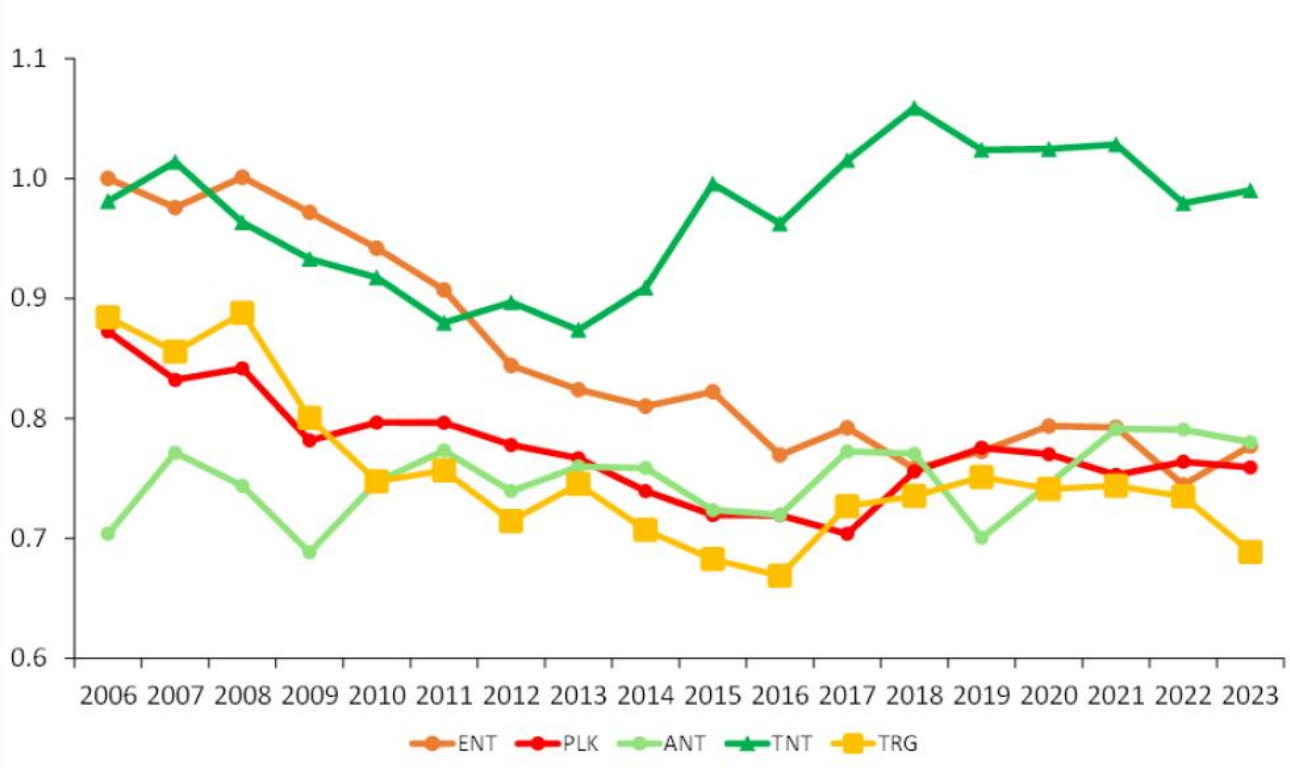

Figure 13: Multilateral Total Factor Productivity (MTFP) index by TNSP, 2006 to 2023

The AER also uses Multilateral Partial Factor Productivity (MPFP) indices to examine the contribution of capital and operating expenditure to overall productivity in isolation.

Figure 14 shows the Capital MPFP of the TNSPs use of overhead lines, underground cables and transformers. AusNet is the only TNSP that has seen an improvement in capital productivity since 2006 and have been improving since 2019 and is no longer ranked last on this measure.

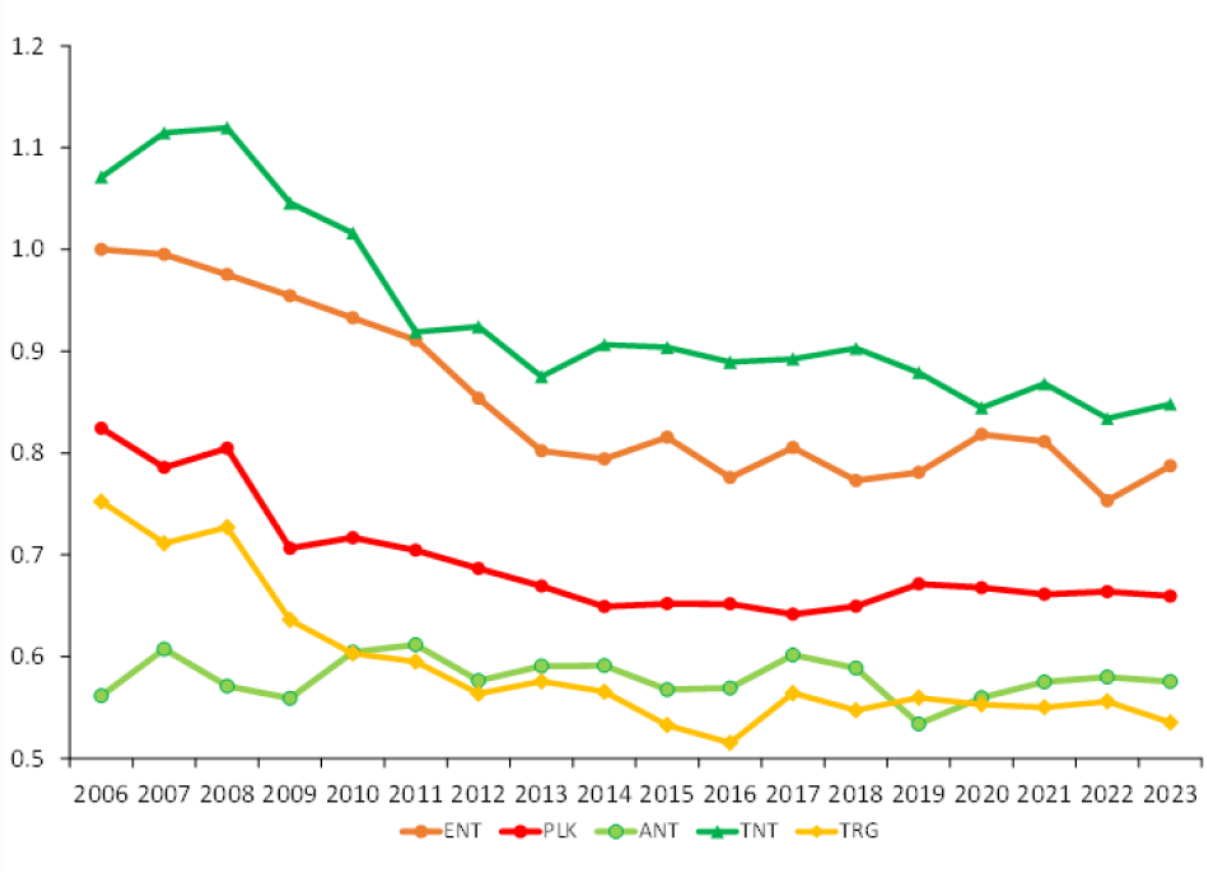

Figure 14: Capital MPFP Index, 2006-2023

Figure 15 shows the operational expenditure MPFP of the TNSPs. AusNet has seen a growth in opex MPFP over 2023 (1.8%) and remains relatively higher performers in this measure.

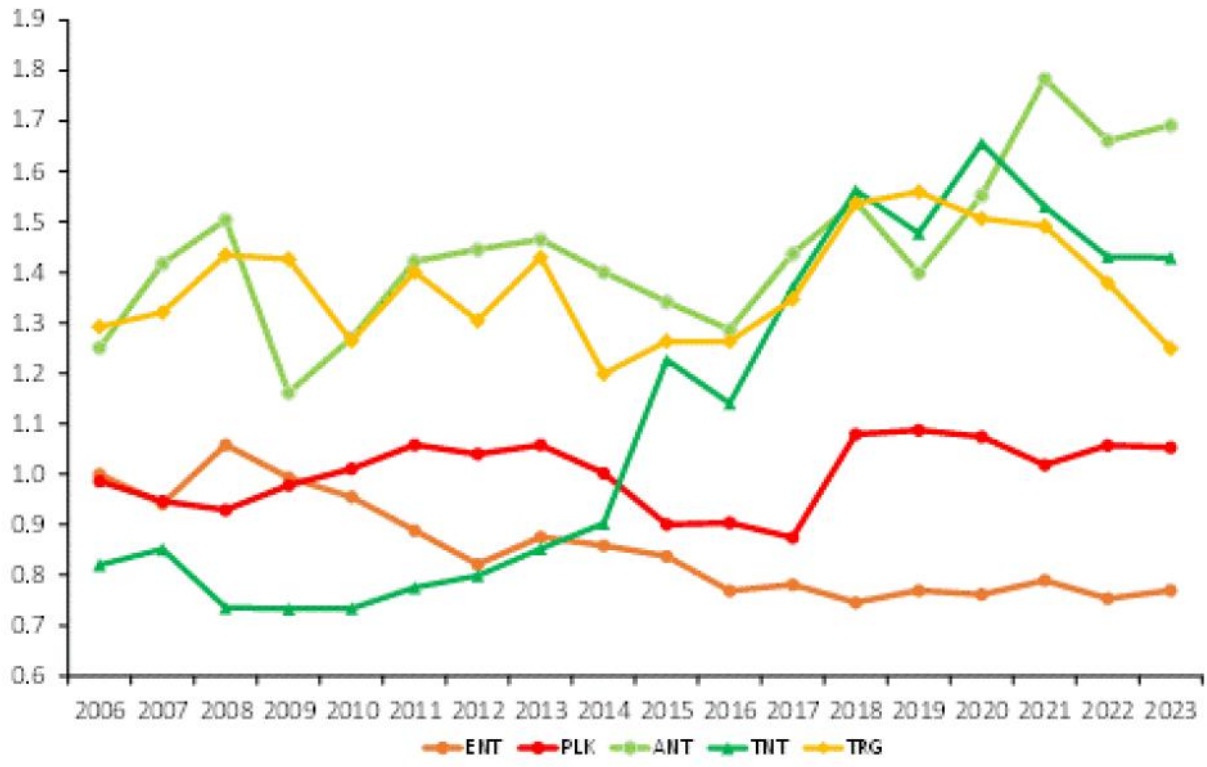

Figure 15: Opex MPFP Index, 2006-2023

6.6. 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, 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.

6.7. Sustainability

6.7.1. Carbon Footprint

Line losses represent almost the entire carbon footprint of the transmission network. These losses are indirect emissions.

The largest component of AusNet's in-house direct emissions is SF_6 gas emissions. Electrical and environmental (i.e. SF_6) costs are included in economic analysis of project options to ensure efficient network augmentation and asset renewal projects are proposed with consideration to AusNet's carbon footprint and sustainability targets.

6.7.2. Emissions Management

Climate change (both in terms of the physical effects and government policies) and funding pressures are likely to continue to influence energy sector direction over the next five years. The precise impacts remain uncertain, with ongoing global research and debate about near-term climate effects and evolving national and international climate policy.

The Government have retained the Clean Energy Regulator and the NGERS as part of the administration of the Emissions Reduction Fund. Through the Safeguard Mechanism, the Clean Energy Regulator requires Australia's highest greenhouse gas emitting facilities to reduce emissions in line with Australia's emission reduction targets of 43% below 2005 level by 2030 and net zero by 2050. AusNet has committed to reducing its in-house emissions by 50% by 2030, with a long-term goal of net zero emissions by 2045.

6.8. People and Culture

The nature of the energy sector will change fundamentally over the next decade, responding to community expectations of safety and reliability, climate change and emerging technologies. The systems, processes, tools and the appropriate employee skills set used to deliver transmission 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. Network Performance

Network performance measures are set annually for a range of key performance indicators and monitored throughout the year to assess the performance of the transmission network. Performance measures cover a range of aspects of the network, in particular reliability and safety.

7.1. Service Target Performance Incentive Scheme (STPIS)

The STPIS is administered by the AER. The STPIS currently consists of the following components:

1. Service Component (SC);
2. Market Impact Component (MIC); and
3. Network Capability Component (NCC).

7.1.1. Service Component (SC)

The Service Component (SC) provides incentives to reduce the occurrence of unplanned outages.

Table 9 shows the revenue at risk associated with each component of the Service Component in the current and subsequent regulatory periods.

Table 9: Service Component revenue at risk

PARAMETER	SUB-PARAMETER	REVENUE AT RISK (% OF MAR)	
		2017-22	2022-27
Unplanned outage circuit event rate	Lines event rate – fault	0.20	0.20
	Transformer event rate – fault	0.20	0.20
	Reactive plant event rate – fault	0.10	0.10
	Lines event rate – forced	0.10	0.10
	Transformer event rate – forced	0.10	0.10
	Reactive plant event rate – forced	0.05	0.05
Loss of supply event frequency	Number of events greater than 0.05 system minutes per annum	0.15	0.15
	Number of events greater than 0.30 system minutes per annum	0.15	0.15
Average outage duration	Average outage duration	0.20	0.20
Proper operation of equipment	Failure of protection system	0.00	0.00
	Material failure of SCADA	0.00	0.00
	Incorrect operational isolation of primary or secondary equipment	0.00	0.00
Total		**1.25**	**1.25**

Table 10 shows the system minute and service component reward for the period 2012 to 2024.

Table 10: System Minutes and Service Component reward for the period 2012-2024

YEAR	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
System Minutes	2.73	1.18	0.585	6.588	9.16	0.022	0.091	8.09	1.026	0.051	0.012	0.1	0.192
STPIS Service Component	80.9%	67.4%	42.0%	11.0%	31.5%	81.7%	84.2%	69.3%	49.6%	59.3%	75.7%	116.5 %	70.0%

7.1.2. Market Impact Component (MIC)

The Market Impact Component (MIC), referred to internally as the Market Impact Parameter (MIP), provides an incentive to minimise the impact of transmission outages at times and on parts of the network that are most important in influencing the spot price in the wholesale market.

Performance is measured based on the number of five-minute dispatch intervals (DIs) when an outage of a TNSP's network results in a network outage constraint binding with a marginal value greater than $10/MWh.

For the calendar year 2024, AusNet reported 2779 Dispatch Intervals (DIs) resulting in a net penalty of $5.1 million. A breakdown of the results is shown in Table 11.

Table 11: Breakdown of Results for 2024

TARGET (DI)	**1245**
Business Target (DI)	1525
Submitted (DI)	2779
Maximum Bonus	$6.41m
Maximum Penalty	-$6.41m
Submitted Bonus/Penalty	-$5.1m

Calendar year 2024 was another year for high binding constraints (255,221). AusNet had submitted a position in the current TRR for the performance results to rely heavily on a pragmatic application of exclusions. To be consistent with this TRR position and recent submissions this pragmatic approach was applied to CY24 with 98.9% of counts being excluded. This still resulted in a significant number of Dispatch intervals included, 2779, which is capped at 1525.

The AER's final decision on AusNet's TRR approved pragmatic standard exclusions for the next TRR period. The AER suspended the MIC in its latest STPIS Guidelines, released April this year, and this will be made effective from 1 April 2027, the next TRR period. AER will be requiring additional reporting on planned outages decisions, and will consult on alternative scheme arrangements.

See Table 12 for a historical comparison of final counts using version 5 of the STPIS.

Table 12: Market Impact Component Historical Data

YEAR	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Dispatch intervals	1,417	2,134	2,687	909	745	858	906	6,200	2,158	318	1,510	967	3,756	746	1,478	2,279

7.1.3. Network Capability Component (NCC)

The Network Capability Component (NCC) provides incentives to deliver low cost, one-off projects that increase network capability and deliver value for money to customers.

Under new AER STPIS Guidelines (Version 6, April 2025), NSPs are no longer required to submit a Network Capability Incentive Parameter Action Plan (NCIPAP) as part of its revenue proposal. Instead, TNSPs can choose to propose 'priority projects' as part of the annual Transmission Planning report, subject to limit that proposed expenditure of all 'priority projects' in one regulatory year do not exceed 1% of the TNSP's maximum allowed revenue. This Guideline begins from 1 April 2027, and previous NCIPAP arrangements continue until then. Guideline begins from 1 April 2027, and previous NCIPAP arrangements continue until then.

In Victoria, the involvement of AEMO (now VicGrid) is more substantive – given their role as planner of the Victorian transmission network, and they are responsible to assist AusNet to quantify and assure project benefits.

The parameter facilitates improvements in the capability of the transmission assets through operational expenditure and minor capital expenditure on the network which results in material benefit. Capital expenditure for a project will be considered to be minor capital expenditure if the estimated capital cost is less than the threshold requiring a regulatory investment test ($8m as at 1 Jan 2025).

Some projects approved by the AER and completed by 2022 are shown in Table 13.

Table 13: Network capability priority projects for 2017 to 2022

PROJECT	EXPECTED COMPLETION DATE	VALUE	NOTES
SmartWires Research Project – Install 30 SmartValve devices at WOTS on the JIND-WOTS 330 kV transmission line to deliver approximately 7Ω of controllable series reactance to increase the interstate power transfer capability.	31/08/2021	$5.87 million	Completed 31 August 2021
Install a 100 MVAr 220 kV reactor at Keilor Terminal Station (KTS)	31/03/2021	$5.992 million	Completed 30 April 2021
Increase 15 min short term rating of BETS–KGTS–WETS – RCTS 220 kV transmission line	30/11/2021	$4.3 million	Completed 30 August 2021
Increase 15 min short term rating of BATS–TGTS–MLTS 220 kV transmission line	30/11/2020	$1.5 million	Completed

The project approved by the AER for the 2023/27 regulatory period is shown in Table 14.

Table 14: Network capability priority projects for 2023 to 2027

PROJECT	EXPECTED COMPLETION DATE	VALUE	NOTES
Realtime System & Restoration Manager (RTSRM)	2023/27 TRR period	$0.85 million	Completed 28 November 2024

7.2. Safety

Table 15 lists the safety performance indicators reported within the network safety report.

Table 15: Safety Performance Metrics

INDICATOR	DESCRIPTION
BFM Transmission Index	Measure of the level of asset replacement and maintenance work outstanding with the objective to maintain 'zero' indices in HBRA for the duration of the declared fire season.
Explosive plant failures	Key transmission network safety risk as identified in the latest ESMS, and required to be reported to Energy Safe Victoria
Line Drops	Key transmission network safety risk as identified in the latest ESMS, and required to be reported to Energy Safe Victoria

8. Process and Systems

This section covers the major processes and systems required to manage the transmission network for the achievement of the desired outcomes. AusNet got recertified to ISO 55001 in August 2025 after the certification lapsed in 2020. The Asset Management System is maintained and refreshed to ensure ongoing effectiveness of the Asset Management System.

8.1. Risk Management

Risk management within the transmission network is consistent with the Enterprise Risk Management Framework (RM 10-01) and adopts common risk matrices and categories.

AusNet uses a range of techniques to identify, analyse and evaluate risks to determine the most appropriate control or treatment for each risk. The technique used to determine risk depends on the asset type and the asset data available. Risk assessments and replacement forecasts are compared, contrasted and assessed using engineering judgement to inform the management of risk and the development of maintenance programs and replacement forecasts.

Key strategies for the management of risks within transmission 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)8;
- 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 criticality and/or risk scores for key equipment;
- Develop and implement risk-based maintenance plans for key equipment; and
- Enhance risk-based replacement and refurbishment programs.

The enterprise risk management process and methodology are detailed in RM 10-01 Enterprise Risk Management Framework and the methodology for assessing risk is detailed in AMS 01-09 Asset Risk Assessment Overview

8 30-4006 AusNet Services' Integrated Response and Contingency System

8.2. Electricity Safety Management Scheme (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 2019* and *AS 5577 Electricity Network Safety Management Systems*.

The ESMS forms an outcome based regulatory framework against which Energy Safe 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 transmission network. This management philosophy supports a continuous improvement approach toward the development and maintenance of preventative strategies designed to network safety risk.

Formal Safety Assessments (FSAs) are conducted as part of the development of the ESMS to identify, analyse, evaluate and identify options to treat risks. As per the Energy Safe Safety Guidelines published in December 2024, energy infrastructure companies are required to

- identify all foreseeable hazards and risks arising from their infrastructure
- identify the risk controls available to eliminate, prevent or reduce the safety risks and;
- implement the most effective control or combination of controls to eliminate each safety risk where that is practicable, or
- where it is not practicable to eliminate a safety risk, implement all practicable controls that contribute to the minimisation of the safety risk.

Key elements of the scheme include:

- A formal safety assessment including methodology, hazards identified and measures to reduce those hazards as far as practicable (AFAP);
- A description of the management scheme including content, responsibilities, formal policy, technical standards applied and an asset management plan detailing the change management process;
- Other processes and procedures that support the scheme including incident reporting and investigation, emergency preparedness, reporting for serious incidents, competence and training and record keeping.
- Key Performance Indicators;

Further details can be found in *ESMS 10-01 Safety Management System (Electricity Transmission)*.

8.3. Health and Safety Management

AusNet's health and safety management system complies with the Occupational Health and Safety Act 2004 and is certified to ISO 45001:2018 Occupational Health and Safety Management Systems, enabling a framework to manage health and safety across our business.

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.

8.4. 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 HESQ 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 stations;
- Minimise release greenhouse gases to the atmosphere; 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 are detailed in Table 16**Error! Reference source not found.**.

Table 16: Environmental strategies

CATEGORY	STRATEGIES
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 station augmentation • Removal of friable asbestos containing materials • Maintenance of asbestos handling procedures and training
Management of noise abatement	• Monitor noise levels of 'noisy' stations • Selection of plant with low noise characteristics • Maintain existing land buffers around stations
Greenhouse gas reduction	• Monitor and implement where practicable, alternatives to and minimisation of atmospheric release of SF_6

CATEGORY	STRATEGIES
Vegetation Management	• Compliance with regulations, codes and guidelines, including annual submission of a Vegetation Management Plan to Energy Safe Victoria 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.

Further details can be found in *AMS 01-10 Environmental Management*.

8.5. Condition Monitoring

The asset condition information is critical for the optimisation of maintenance plans and prioritisation of asset replacement programs. AusNet utilises online and off-line condition monitoring (CM) techniques to continuously improve levels of network reliability and safety.

Existing CM programs for the Victorian electricity transmission network comprise visual inspections, photographic and video inspection records, off-line diagnostic tests, on-line or real time monitoring and routine non-invasive scanning. AusNet continues to monitor developments in condition monitoring techniques and inspection technologies that could be effectively applied to network assets. Adoption of any new technologies is dependent on and does need to consider effectiveness and efficiency compared to traditional methods, costs of monitoring equipment, resource upskilling requirements, maintenance of systems and data platforms, and change impact on current organisation operations.

8.6. Plant and Equipment Maintenance

AusNet's asset maintenance strategies ensure the safe and reliable operation of the transmission network assets. The asset maintenance strategies are developed using engineering best practice, incorporating manufacturer recommendations, and are in accordance with Energy Safe regulations.

AusNet's maintenance programs are primarily managed via SAP, a computerised maintenance management system (CMMS). Predominantly, the asset maintenance plan is enacted based on a recurrent nature, and is categorised into scheduled maintenance, corrective unscheduled maintenance and emergency maintenance tasks.

The highest volume of tasks completed as part of asset maintenance plan are scheduled maintenance tasks which involve time-based inspection, or overhauls of network assets. During these tasks condition-based data is collected to allow for predictive corrective maintenance to be carried out. Issues or defects identified through asset inspection, or overhaul process are rectified as corrective maintenance tasks within predefined timeframes, depending on the level of risk associated with the defect. Corrective maintenance can also involve investigation and resolution of equipment monitoring alarms received via the SCADA system. Emergency maintenance tasks require urgent attention and are usually triggered by fault events which adversely affect the overall availability of the transmission network.

The strategies for plant and equipment maintenance are currently being reviewed detailed in AMS 10-19 *Plant and Equipment Maintenance*.

8.7. Asset Replacement and Refurbishment

In deciding between the replacement and refurbishment of assets, a range of asset management options are identified and evaluated, utility practices analysed and supporting arguments developed. Primary requirements for any replacement or refurbishment decision are a well-defined asset management strategy, a sound knowledge of asset condition and related factors affecting performance and expected technical life. AusNet's plant maintenance strategies and their supporting asset risk models provide guidance on optimal asset management approaches for different asset classes operating on the transmission network.

Where relevant, AusNet quantifies electricity-sector emissions impacts of credible options and applies a transparent Value of Emissions Reduction (VER) consistent with the AER's Expenditure Forecast Assessment Guideline (Oct-2024). Assumptions, emissions factors and calculation methods are documented in a standing VER methodology note and referenced in business cases and RIT-T publications.

Negative energy demand growth, closures of large industrial customers, potential generator retirements and targeted carbon emission reductions present risks that network assets may become unused or underutilised in the future. Changes have been made to the economic planning criteria used to assess asset replacement and refurbishment projects to minimise the risk of new assets becoming stranded in future. The economic planning criteria now incorporate assessments of a broader range of options including asset retirement, capacity downsizing, non-network solutions and distribution network alternatives. The option selection process now considers the maximum loss which could result from selecting a particular option by means of a regret function and investment breakeven analysis has been introduced to consider irreversibility and uncertainty in investment decisions. Further development is needed to refine the assessment of safety risk during option selection.

In addition to the internal assessment processes, AusNet also engages in joint planning activities with the Victorian system planners, including AEMO, VicGrid and the DBs, to ensure any proposed asset replacement or refurbishment aligns with broader network needs and remains justified over the long term. These collaborative planning processes help confirm that the asset in question is required to support future network reliability, security, and anticipated demand, thereby reducing the risk of stranded or underutilised assets as system requirements evolve.

For further information please refer to AMS 10-24 *Asset Renewal Planning Guideline*.

8.8. Asset Management Information Systems

AusNet's main asset management information systems are:

- SAP for asset and work management;
- Protection and Control Setting Information System (PACSIS) for relay settings;
- Ratings Database Repository (RADAR) for plant and equipment normal ratings;
- Spatial Data Management Electricity (SDME) for spatial display and network modelling and
- Upvise Field Mobility Solution
- DNA information management platform
- Objective Drawing Management system
- Enterprise Document Management System

Other existing operational transmission critical systems include such as:

- Teleprotection (Comms+)
- SCADA (Supervisory control and data acquisition)
- SCIMS (Substation Communication Information Management System)

- Contingency management applications – i.e. load shedding, asset overload schemes
- Engineering WAN – remote access to IEDs
- Asset condition alarms, e.g. CAMS
- Brave (Mondo) – Meter data management

Ongoing investment is required to enhance capabilities in areas such as:

- Near real time Asset and Network Risk Modelling
- Asset Performance Monitor (APM) system
- Asset Data governance tools and synchronisation of systems
- Increased sensing (distributed) and non-network data sets that enable appropriate asset risk management
- AI based Condition Assessment of the Transmission Lines network, e.g. SAIP
- Cyber and physical security systems
- Extension of IEC 61850 Standards to enable station to station operational and configuration management
- Increased visibility of sub-transmission load flows and contingency impact on transmission assets
- Increase comms fibre network (data) for new generators, DBs and AEMO
- Phasor Measurement Unit (PMU) applications for the purposes of real time network stability monitoring with a view to unlocking renewable connection capacity.
- Meter network performance and meter data reliability and analytics.

The key drivers of improvement in the asset management information systems are:

- Move to collect all asset and maintenance data in digitised formats
- Improving data quality for informed operation and strategic decision making;
- Move to automate operational inspection and maintenance activity
- Increasing costs of supporting disparate, customised, non-interfaced systems;
- High risks associated with reliance on the 'local knowledge' and SME workforce;
- Repeatable, transparent and auditable processes to assure compliance to regulatory and safety obligations; and
- Replacement of obsolete legacy systems.

8.9. Economic Assessment of Projects and Programs

AusNet is focused on delivering optimal transmission network performance at efficient cost. Except in the case where outputs are mandated, this requires an explicit cost benefit analysis to be undertaken to determine the most efficient allocation of capital expenditure.

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 16. 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.

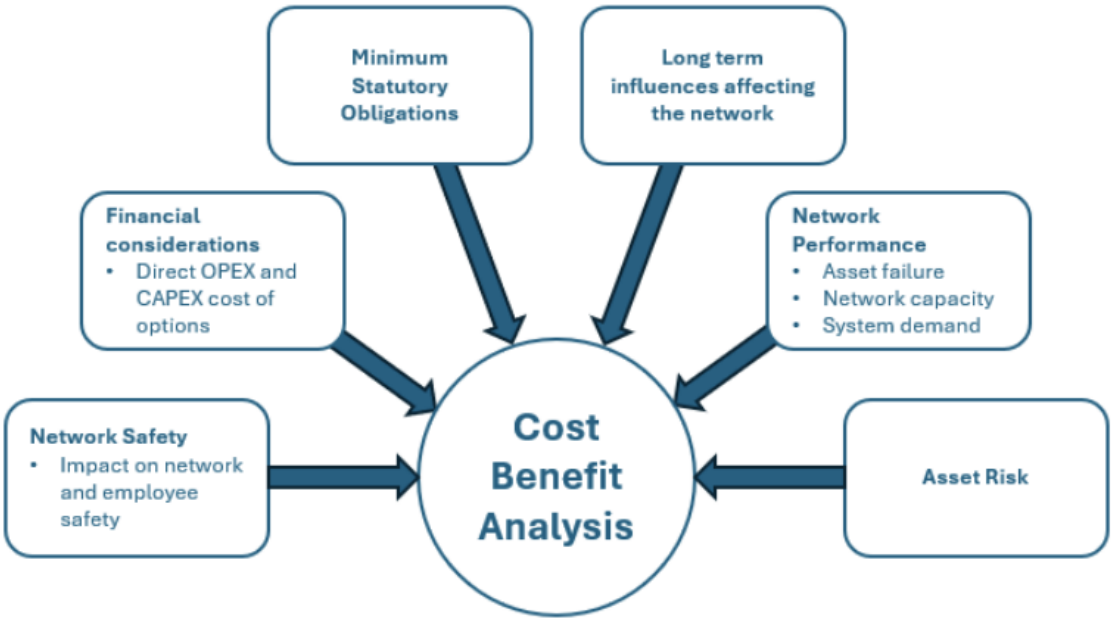

Figure 16: Cost Benefit Analysis Drivers

AusNet also quantifies the benefits of emissions reduction through the VER, these benefits support, rather than drive investment outcomes.

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

8.10. Program Delivery

AusNet has a Project Management Framework that is designed to guide projects from concept to completion through six critical gates. Each gate ensure alignment with our corporate strategic goals and foster successful project outcomes. This framework is shown in Figure 17.

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.

AusNet manages deliverability risks through the following measures:

• Strategic long-lead procurement, including category strategies for transformers and reactors, establishment of framework agreements, and securing early factory production slots.

• Outage access management, utilising an integrated outage plan in collaboration with AEMO and VicGrid during constrained periods, and implementing selective live-work practices where deemed safe and justified.

• Portfolio governance, applying capacity-based stage gates, risk sequencing, and earned-value tracking at the portfolio level.

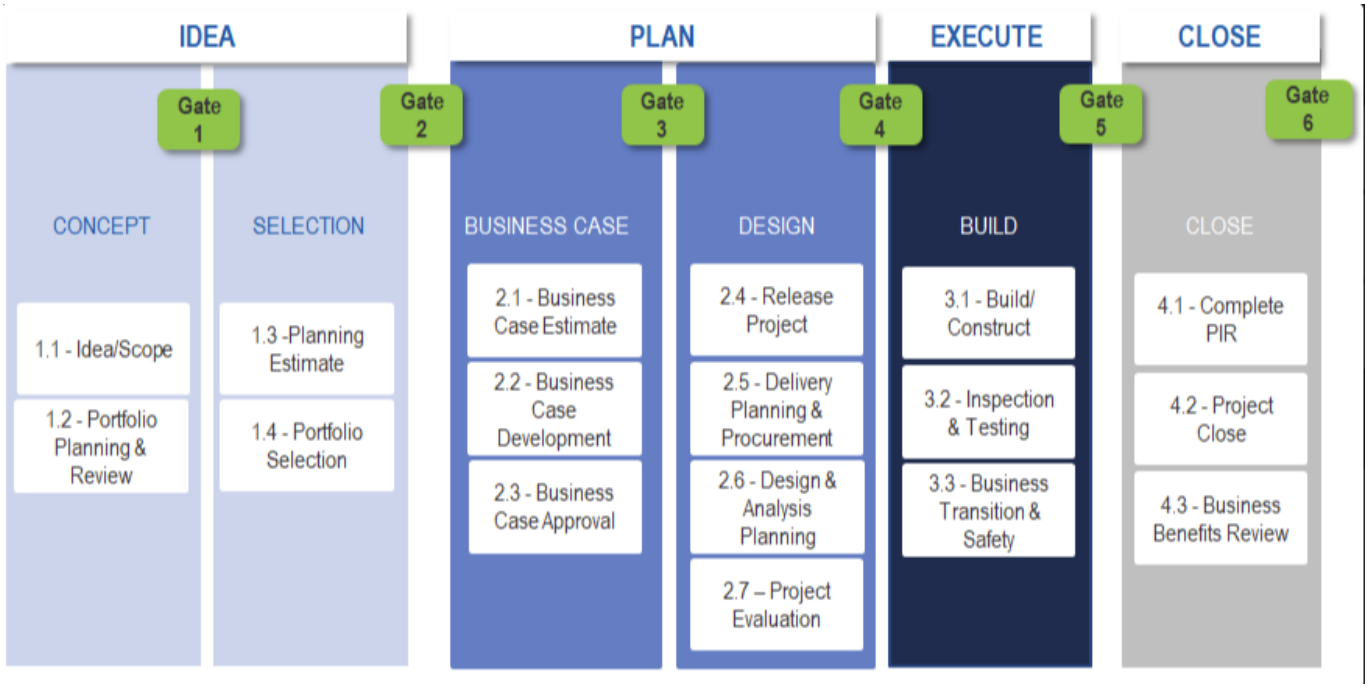

Figure 17: Project Governance Framework – Stage Gate Process

Projects and programs are delivered in accordance with the approved business case and project management plan. The project lifecycle is supported by the SAP system and work instructions.

The resource model includes the use of internal and external resources in the delivery of maintenance and capital works programs.

AusNet has formed Strategic Alliances with companies that provide design services, installation services and maintenance services. Contract arrangements are performance-based with benchmarking of costs and standards to ensure that quality and value is maintained throughout the contract.

Strategies for program delivery and optimisation are:

- Maintain key internal resources within the Delivery area to ensure that strategic works and program control services can be sustained;
- Plan maintenance and capital works to ensure the efficient use of resources, the maximisation of network availability and the reduction of risks to supply security;
- Provide program management resources on a functional basis, covering project control, estimation, engineering standards and field technical services;
- Use unified systems which link the core project activities of planning, estimation and costing.
- Use the Constructability, Operability and Maintainability review process to test and confirm the appropriateness of technical decision making at key stages in the development and execution of major network augmentation, refurbishment and replacement projects;
- Conduct internal Post Implementation Reviews or lessons learned of all projects, with key projects undergoing these reviews by independent teams such as CPG and where necessary, external consultants;
- Use the Terminal Station design guide and the pre-qualified design service providers to ensure that engineering and quality standards are maintained;
- Maintain construction resources within AusNet to ensure that key strategic projects can be delivered to the required schedule; and
- Control and supervise all site works through the field service areas to ensure safety, network security and quality of workmanship.

8.11. Network Performance Monitoring

The effectiveness of AusNet's asset management practices is measured directly by the performance of extra high voltage network elements and their impact on the availability and reliability of the Victorian electricity transmission network in which they operate.

The development of these practices requires the reliable capture of accurate information and data, effective analysis and trending and robust decision support tools. Additional comparisons with the Key Performance Indicators (KPIs) set by the Australian Energy Regulator (AER), Australian Energy Market Operator (AEMO), Energy Safe Victoria and comparisons with externally benchmarked performance standards guide the adjustment of practices.

For further information please refer to AMS 10-17 *Network Performance Monitoring*.

9. Abbreviations and definitions

TERM	DEFINITION
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AFAP	As far as practicable
AMO	Asset Management Objective
AMS	Asset Management System
ANT	AusNet
APM	Asset Performance Monitor
ATS West	Altona West Terminal Station
BATS	Ballarat Terminal Station
CBD	Central Business District
CBTS	Cranbourne Terminal Station
CCC	Customer Consultative Committee
CI-RMP	Critical Infrastructure Risk Management Plan
CM	Condition Monitoring
CMMS	Computerised Maintenance Management System
C-SAT	Customer Satisfaction
CSI	Customer Service Index
DB	Distribution Business
DER	Distributed Energy Resources
DI	Dispatch Interval
DNSP	Distribution Network Service Providers
EAM	Enterprise Asset Management
EDPR	Electricity Distribution Price Review
ENT	ElectraNet
ESMS	Electricity Safety Management Scheme
FBTS	Fisherman's Bend Terminal Station
FSA	Formal Safety Assessments
HOTS	Horsham Terminal Station
HSE	Health, Safety, Environment
HSEQ	Health, Safety, Environment and Quality
HTS	Heatherton Terminal Station
HWPS	Hazelwood Power Station

HYTS	Heywood Terminal Station
IED	Intelligent Electronic Device
ISP	Integrated System Plan
JIND	Jindera
KPI	Key Performance Indicator
LYPS	Loy Yang Power Station
MIC	Market Impact Component (of STPIS)
MWTS	Morwell Terminal Station
MIP	Market Impact Parameter
MTFP	Multilateral Total Factor Productivity
MPFP	Multilateral Partial Factor Productivity
NCC	Network Capability Component (of STPIS)
NCIPAP	Network Capability Incentive Parameter Action Plan
NEL	National Electricity Law
NEM	National Electricity Market
NER	National Electricity Rules
NGERS	National Greenhouse and Energy Reporting Scheme
NPV	Net Present Value
NSW	New South Wales
ODP	Optimal development path
PACSIS	Protection and Control Setting Information System
PCB	Poly Chlorinated Biphenyls
PSCR	Project specification consultation report
PADR	Project assessment draft report
PACR	Project assessment conclusions report
PLK	Powerlink
PMU	Phasor Measurement Unit
PV	Photovoltaic
RADAR	Ratings Database Repository
RBM	Risk Based Maintenance
RCM	Reliability Centred Maintenance
RDP	Renewable (Energy Zone) Development Plan
RCTS	Redcliffs Terminal Station
RIN	Regulatory Information Notice
RIT-T	Regulatory Investment Test – Transmission

RTS	Richmond Terminal Station
RWTS	Ringwood Terminal Station
SA	South Australia
SAIP	Smart Aerial Image Processing
SC	Service Component (of STPIS)
SCADA	Supervisory Control and Data Acquisition
SCIMS	Substation Communication Information Management System
SDME	Spatial Data Management - Electricity
SMTS	South Morang Terminal Station
SOCI	Security of Critical Infrastructure
SPIRACS	AusNet's Integrated Response and Contingency System
STPIS	Service Target Performance Incentive Scheme
TAS	Tasmania
TGTS	Terang Terminal Station
TCPR	Transmission Connection Planning Report
TRG	Transgrid
TSAP	Transmission Stakeholder Advisory Panel
TNSP	Transmission Network Service Provider
TNT	TasNetworks
VAPR	Victorian Annual Planning Report
VCR	Value of customer reliability
WMTS	West Melbourne Terminal Station
WOTS	Wodonga Terminal Station

10. Legislative references

STATE	REGULATOR	REFERENCE
All		National Electricity Law
All		National Electricity Rules
All		Electricity Safety Act 1998
All		Electricity Safety (Management) Regulations 2009
All		Renewable Energy Zone Development Plan (RDP)
All		National Greenhouse and Energy Reporting Scheme (NGERS)
All		AS/NZS ISO 31000 Risk management – Guidelines
All		AS 5577 Electricity Network Safety Management Systems
All		Occupational Health and Safety Act 2004
All		AS/NZS 4801 Occupational Health and Safety Management Systems

11. Resource references

DOCUMENT ID	DOCUMENT TITLE
10-1016	Delegation of Authority Policy
AMS 01-02	Asset Management Policy
AMS 01-05	Strategic Asset Management Plan
AMS 01-09	Asset Risk Assessment Overview
AMS 01-10	Environmental Management
AMS 01-12	Asset Management System Manual
AMS 10-17	Network Performance Monitoring
AMS 10-19	Plant and Equipment Maintenance
AMS 10-24	Asset Renewal Planning Guideline
AMS 10-25	RIT-T Asset Replacement Process
AMS 10-52	Auxiliary Power Supplies
AMS 10-53	Capacitor Banks
AMS 10-54	Circuit Breakers
AMS 10-55	Civil Infrastructure
AMS 10-56	Communication Systems
AMS 10-58	Diesel Generators
AMS 10-59	Disconnectors and Earth Switches
AMS 10-60	Earth Grids
AMS 10-61	Fire Detection and Suppression
AMS 10-62	Gas Insulated Switchgear
AMS 10-63	Infrastructure Security
AMS 10-64	Instrument Transformers
AMS 10-65	Line Easements
AMS 10-66	Power Cables
AMS 10-67	Power Transformers and Oil-Filled Reactors
AMS 10-68	Secondary Systems
AMS 10-71	Static VAR Compensators
AMS 10-73	Surge Arresters
AMS 10-75	Transmission Line Insulators
AMS 10-77	Transmission Lines Structures
AMS 10-78	Transmission Lines Structure Foundations
AMS 10-79	Transmission Lines Conductors
AMS 40-01	Contestable, Contracted & Unregulated Electricity Asset Management Strategy
CI-RMP	Critical Infrastructure Risk Management Plan
ESMS 10-01	Electricity Safety Management Scheme – Electricity Transmission Network

PRS 10-18	Physical Security Standard
RM 10-01	Risk Management Framework

12. Appendices

None

13. Schedule of revisions

ISSUE	DATE	AUTHOR	DETAILS OF CHANGE
10	08/02/2013	C Rabbitt J Dyer D Meade	Major review and update
11	19/08/2013	J Dyer	Annual review and update
12	11/08/2014	D Meade	Align network strategies, review and update
13	21/10/2015	P Seneviratne	Review and update
14	28/10/2016	C Rabbitt	Review and update
15	17/08/2017	S Owens	Review, update and structure change
16	09/11/2018	J Dyer	Review and update
17	21/11/2019	A Dickinson	Restructured to align with AMS 20-01 Minor spelling and grammatical changes Section 2.3 updated to add AEMO as stakeholder Section 2.5 updated with TRR engagement Section 2.6 updated with connection numbers for 2019 Section 2.7 created to highlight changing requirements on transmission Section 2.9 updated market modelling requirements Section 2.10 updated to align with Energising Futures strategy Section 2.11 updated to align with business plan Section 2.13 Reference to ENTR deleted and ISP added Section 2.15 Network demand forecasts updated Section 3.1 diagram added to highlight changing requirements on transmission Section 3.2 diagram updated Section 3.3 Asset summary updated Section 4 revised and policy moved to appendix Section 5.1 diagram updated Section 5.3, Table 4 updated Section 5.4 diagrams update from 2019 benchmarking report Section 6 Asset management objectives updated Section 7.1.3 updated with new projects and to reference reaching limit of scheme Section 8.1 reference to maintenance added Section 8.3 updated to align with current plan Appendix Schedule of Revisions added
18	27/11/2020	N Boteju	Minor grammatical changes Section 2.2 Fig 2 updated Section 2.6 updated last para regarding new generator connection Section 2.9 updated to align with current plan Section 2.10 updated wording Section 2.13 updated the section entirely Section 2.15.1 Figures 3 and 4 updated Section 3 updated Gas, Electricity Distribution and Electricity Transmission customer and Network Data

			Section 3.2 Figure 9 updated Section 4 updated wording Section 5.1 Table 3, added 'Network Importance para, and Figure 10 updated Section 5.2 Figure 11 and the commentary updated Section 5.3 reference to AMS 10-22 deleted, Table 4 updated Section 5.4 updated figures 12,13 and 14 including the associated commentaries. Section 5.5 reference to AMS 10-13 deleted Section 6 Figure 15 alignment of Objectives updated Section 7.1.1 Table 6 updated Section 7.1.2 Table 7 and Table 8 updated including the associated commentaries Section 7.1.3 Table 9 updated Section 8.5 reference to AMS 10-13 deleted Section 8.7 reference to AMS 10-11 deleted Section 8.8 updated statement on PMU units for real time network stability monitoring renewable connections Appendix C.C1 reference to AMS 10-22 & AMS 10-13 deleted
19	25/08/2021	M Durox	Approver changed to Strategic AMC Section 2.2 Added paragraph about REZ Section 2.4 Updated Corporate Strategy on 1st line Section 2.5 Updated Customer and Community Engagement (Lucy Holder) Section 2.10 Updated Corporate Business Plan Ex-Section 2.11 Removed section about "Electricity Transmission Business Plan" and replaced it with "Asset Management Objectives" Section 2.13 Added comments about ISP Section 2.14 Replaced section with information about RDP Section 2.15.2 Updated charts Section 3.3 Updated Asset summary based on 2021 Transmission RIN report Section 5.2 Updated chart Section 5.3 Updated Corporate Risks Section 6 Removed data related to previous Objectives Section 7.1.2 Updated Market Impact Component Section 7.1.3 Updated project status in table 9 & added Table 10 with proposed projects Section 8.4 Updated reference to AMS 01-10 Environmental Management Section 8.8 Added mention to DnA Platform Appendix C Updated list of relevant documents Updated acronyms list
20	28/10/2022	M Durox	Template updated AusNet's name rebranded Section 2.5 Comms team updated Section 5.2 Updated by Network Planning Section 5.3 updated by Risk team Section 7.1.3 Updated by Network Planning Sections 9.1.3 Table 10 updated with latest projects Sections 9.1, 9.2, 9.3 & 9.4 updated
21	15/10/2025	S Ling, C Hughes	Order of sections updated Section 3.2 Updated asset summary based on July 2024 RIN report

	Section 4.1 Updated corporate strategy, simplified safety vision and stakeholder expectations, VicGrid role change Section 4.2.3, 4.2.5, 4.2.7, 4.2.8 Updated by Network Planning Section 4.2.6 Updated by Network Operations Section 4.2.4, 4.2.9, 4.2.10 updated Section 4.2.10 Updated using latest ISP Section 5 Updated by Group Operations Asset Management Section 6 Updated by Group Operations Asset Management Section 6.4 Updated based on information from Security team Section 7.1.1 Updated by Network Management Section 7.1.2 Updated by Network Operations Section 7.1.3 Updated by Network Planning Section 8 Updated Updated acronyms list Updated resource references list

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