

SUBMISSION TO SELECT COMMITTEE ON ENERGY AND PLANNING AND REGULATION IN AUSTRALIA

Introduction

AEMO welcomes the opportunity to make a submission to the Senate Select Committee on Energy Planning and Regulation in Australia.

As Australia's energy system and markets have evolved, so has the role of governments, industry, consumers, and the energy market bodies: the Australian Energy Market Operator (AEMO), the Australian Energy Market Commission (AEMC) and the Australian Energy Regulator (AER). Energy planning and regulation is one of Australia's most significant, and most complex, examples of co-operative federalism. No one government alone can deliver on energy outcomes for Australian consumers. Nor can one industry segment, or consumer group.

Collaboration by stakeholders within the frameworks and strategies established by National Cabinet, including the Energy and Climate Change Ministerial Council (ECCM), is key to running Australia's energy system and markets, while the market bodies exercise their respective statutory functions and powers.

The terms of reference for the inquiry are broad and address many aspects of Australia's energy systems and markets. The terms of reference most relevant to AEMO are:

- a) the three overarching laws within which energy markets are governed:
 - i) National Electricity Law,
 - ii) National Gas Law, and
 - iii) National Energy Retail Law.
- c) The role and function of AEMO, including its development of the Integrated System Plan in accordance with National Electricity Objectives.
- g) The statutory framework which supports consideration of stakeholder views and the public interest.

AEMO's submission is in three parts:

- Part one – AEMO's functions and governance
- Part two – Integrated System Plan
- Part three – Engaging our stakeholders

AEMO's submission draws on a number of publicly available documents and reports, including: AEMO's [FY25 Strategic Corporate Plan](#), the [2024 Integrated System Plan](#), the [2024 Integrated System Plan Overview](#), the [2024 ISP Factsheet](#) and [AEMO's Stakeholder Engagement Framework](#).



PART ONE: AEMO'S FUNCTIONS AND GOVERNANCE

About AEMO

AEMO is Australia's independent, not-for-profit energy system and market operator. AEMO has a national footprint and around 1,500 employees including engineers, scientists, economists, IT and digital specialists, in addition to corporate support capabilities.

AEMO operates alongside the Australian Energy Market Commission (AEMC), which makes the rules under the National Electricity Law and the National Gas Law, and the Australian Energy Regulator (AER), which oversees economic regulation, reporting and compliance.

AEMO's functions are prescribed in the laws, rules and regulations that govern Australia's energy sector. AEMO communicates its purpose as "to ensure the secure, reliable, and affordable energy and to enable the energy transition for the benefit of all Australians". AEMO's prescribed functions fall into three categories:

- Operating energy systems (electricity and gas),
- Operating energy markets (electricity and gas), and
- Planning and enabling the energy system of the future.

AEMO was established in its current form in 2009 by the Council of Australian Governments (COAG). AEMO is registered under the *Corporations Act 2001* as a member-based not-for-profit company limited by guarantee. AEMO's membership is shared between government, federal and state (60%), and industry (40%), as discussed below.

Evolving over time

AEMO's responsibilities have evolved alongside Australia's changing energy landscape. AEMO's predecessor, National Electricity Market Management Limited (NEMMCO), was established in 1996 to manage the National Electricity Market (NEM) in the eastern and south-eastern states and territories. In 2009, other state-based functions including the Victorian gas market and electricity planning functions of the Victorian Energy Networks Corporation (VENCorp) were brought together with the NEM operator functions and NEMMCO was renamed AEMO.

In the years following AEMO's establishment, governments have conferred additional functions on AEMO. This has included adding various gas market functions and becoming the market and independent power system operator for Western Australia from 2015.

The complexity of AEMO's operating environment has also increased due to changing market dynamics as a result of the retirement of coal-fired power stations and rapid uptake of renewable energy by homes, businesses, and investors across Australia. AEMO continues to integrate and manage increasingly high contributions of instantaneous renewable electricity in both the NEM (~74%) and Western Australia's Wholesale Electricity Market (WEM) (~84%), as well as record-breaking periods of maximum demand and minimum demand and managing incidents such as the loss of generation or transmission through storms and other events.

Currently, over 600 market participants are registered to take part in the electricity and gas markets operated by AEMO, which trade and dispatch energy 24 hours a day, 365 days a year. In the 2024 financial year 181,362



gigawatt hours (GWh) of energy was traded in the NEM at a total value of \$17.7 billion, 17,834 GWh of energy was traded in the WEM at a total value of \$2.7 billion, and 344 petajoules (PJ) of gas was traded in the east coast gas markets at a total value of \$4.7 billion.

AEMO's Functions

AEMO has a range of functions prescribed in energy market laws and rules in relation to electricity and gas system and market operations and planning.

Operating electricity and gas systems

Electricity systems

AEMO manages the real-time operations of the east coast NEM and the west coast WEM to meet prescribed standards of security and reliability. AEMO's responsibilities include maintaining system security and reliability for the NEM and WEM through effective operational planning and forecasting, congestion and grid modelling, management of power system conditions, and seasonal analysis and preparation.

Gas systems

AEMO manages real-time operations of the Victorian [Gas Declared Transmission System \(DTS\)](#) and the Victorian [Declared Wholesale Gas Market \(DWGM\)](#) to maintain gas supply in Victoria, including demand forecasting, system security, safety and emergency response, gas quality, wholesale metering and gas supply adequacy. AEMO also has reliability and supply adequacy powers and functions for the east coast gas systems.

Operating wholesale energy markets

Electricity markets

AEMO manages wholesale market operation functions for the NEM and the WEM, including settlement, billing, prudential, metering and retail market operations.

Gas markets

AEMO manages and monitors wholesale, retail and secondary trading gas markets across the east coast, including the Wallumbilla [Gas Supply Hub \(GSH\)](#) that facilitates gas trading with Queensland liquefied natural gas (LNG) producers, [Short Term Trading Market \(STTM\)](#) hubs to balance gas supply in Sydney, Adelaide and Brisbane, gas pipeline capacity trading and auction systems, and gas retail markets, and operates the [Gas Bulletin Board \(GBB\)](#).

Planning and enabling the energy system of the future

National Transmission Planner for the National Electricity Market

AEMO produces the biennial [Integrated System Plan \(ISP\)](#) after extensive consultation with industry, government, and consumer advocates under national energy legislation. The ISP identifies an optimal development path of generation, storage and transmission investments needed to meet the energy needs of homes and businesses as Australia transitions to net zero by 2050, in line with governments' climate targets.



Statements of investment opportunity

AEMO is also tasked by national energy legislation to produce a range of other planning documents to assist industry, investors, consumers, and governments. This includes the annual publication of technical and market data over a 10-year period through the [Electricity Statement of Opportunities \(ESOO\)](#) and [Gas Statement of Opportunities \(GSOO\)](#) for both the east coast and Western Australia. It also includes the publication of the [Victorian Annual Planning Report \(VAPR\)](#) which assesses the adequacy of the Victorian electricity declared shared network (DSN), and the [Victorian Gas Planning Report \(VGPR\)](#), which forecasts gas supply, demand, network capability in the DTS for the next five years.

Reform delivery

AEMO delivers mandated and essential reforms to the NEM wholesale and retail markets, and the WEM and east coast gas markets. This includes the delivery of the [NEM Reform Program](#), an industry-wide program established by AEMO to deliver necessary market and technical reforms recommended in the Energy Security Board's (ESB's) [Post 2025 Electricity Market Design](#) and approved by the ECMC. An example initiative is the recently implemented [Integrating Energy Storage Systems \(IESS\)](#) reforms, a crucial reform to enable batteries to integrate into the NEM more easily and efficiently.

Connections

AEMO undertakes the participant registration and national grid [connection processes](#) to progress the connection of new generation assets to the NEM. As part of this function, AEMO works to deliver improvements to the connections process to accelerate the connections timeline for project proponents. This includes through the delivery of the [Connections Reform Initiative](#), jointly developed by AEMO and the Clean Energy Council.

Victorian transmission network functions

In Victoria, as part of its unique [declared shared network \(DSN\)](#) functions, AEMO undertakes annual planning reviews, considers augmentations to the transmission network via the Regulatory Investment Test for Transmission (RIT-T) process, procures transmission augmentations and system strength services, and progresses connections to the transmission network.

The Victorian Government is currently evolving the way transmission infrastructure is planned and developed in the state, including through the recent *National Electricity (Victoria) Amendment (VicGrid) Act 2024*. The reforms also propose that responsibility for AEMO's Victorian DSN functions will be transferred to VicGrid. Legislation to enable this transfer is expected to be introduced into the Victorian Parliament in 2025.

As part of delivering its DSN functions in Victoria, AEMO has established a subsidiary company, [Transmission Company Victoria Pty Ltd](#), to progress early works for the Victoria – New South Wales Interconnector West (VNI West) transmission project so as to support an accelerated delivery timeline for this project. It is envisaged that this entity will be ultimately transferred to a transmission network service provider (TNSP) to construct and operate the transmission line.

Supporting new investment

AEMO has historically supported investment in Australia's energy markets through our outlooks on required investments and planning reports.



Additionally, in 2021, [AEMO Services Limited](#) was appointed as the NSW Consumer Trustee under the *Electricity Infrastructure Investment Act 2020* with responsibilities for delivering the NSW Government's Electricity Infrastructure Roadmap.

AEMO Services Limited has two members – AEMO (70%) and the NSW Government (30%) – and an independent Board. Membership is open to all Australian jurisdictions. AEMO Services is also able to provide contracted services either under statutory roles or distinct service agreements to meet specific circumstances and requirements.

As Consumer Trustee, AEMO Services Limited conducts competitive tenders to incentivise new energy projects through Long-Term Energy Service Agreements. AEMO Services is also conducting the tender process for the allocation of Access Rights in the South West Renewable Energy Zone (REZ). Since the first NSW tender launched in October 2022, AEMO Services has supported 2,452 megawatts (MW) of renewable energy generation and 574 MW of long-duration storage, and 1,075 MW of firming infrastructure and demand response. Other functions include the authorisation of REZ infrastructure, which is an independent check on project recommendations made by the Infrastructure Planner, EnergyCo. AEMO Services Limited has so far authorised the network infrastructure for one REZ, being Central-West Orana.

In 2023, AEMO was appointed as tender delivery partner for the Commonwealth's [Capacity Investment Scheme \(CIS\)](#). In this role, AEMO supports the Federal Government in the roll-out of the scheme with AEMO Services Limited conducting scheme tenders. In 2023, the first tender for the CIS seeking 2,400 megawatt hours (MWh) of dispatchable capacity for South Australia-Victoria was launched. Final recommendations on projects to be awarded CIS contracts are made to the Federal Government by the CIS Investment Committee appointed by the AEMO board.

Cyber security

Cyber security has evolved rapidly as an energy security risk and is inextricably linked with the secure operation of electricity and gas systems and markets. AEMO:

- Has a role in co-ordinating system responses to cyber incidents that have a potential or actual impact on energy system security or reliability,
- Supports energy industry cyber security maturity and preparedness, and
- Provides advice to government and industry on energy sector specific cyber security vulnerabilities.

A rule change proposal to confirm and clarify these functions in the National Electricity Rules (NER) has been put forward by the Federal Minister for Climate Change and Energy and is being assessed by the AEMC. AEMO also has a range of cyber security obligations under the *Security of Critical Infrastructure Act 2018* (SOCI Act) in relation to our own critical infrastructure assets.

Comparisons with international peers

AEMO regularly collaborates with its peers globally. While the governance and regulatory arrangements for energy system and market operations vary internationally, AEMO's functions are comparable to other system operators that are similarly seeing rapid transformation of their power systems.

Other international system operators such as Great Britain's newly established National Energy System Operator (NEMO), the California Independent System Operator (CAISO) and the Electricity Reliability Council of Texas



(ERCOT) have similar functions as AEMO. These include electricity system and market operator functions, as well as providing market insights and actioning necessary reforms.

Many of AEMO's international peers also have a transmission planning function to ensure that transmission build is strategic and co-ordinated while meeting system and policy needs. This transmission planning function is usually required to support the achievement of their jurisdictions' legislated emissions reduction and/or clean energy targets. For example, CAISO produces an annual transmission plan which addresses the CAISO system transmission needs in line with Californian clean energy targets over a 10-year planning horizon. The NESO has similarly been tasked with developing a centralised strategic network plan, which will address transmission network development needs to 2050 to support the achievement of the UK Government's clean energy targets.

Governance and Legislative framework

AEMO's governance and accountability framework is underpinned by the National Energy Objective of acting in the long-term interests of consumers. This overarching principle guides AEMO's work across all our functions.

There are three key aspects to AEMO's governance framework:

- Corporate governance,
- Performance of statutory functions, and
- Ministerial Council oversight.

Corporate governance

As a not-for-profit company limited by guarantee, AEMO is required to comply with its Constitution and the relevant provisions of the *Corporations Act 2001*, including those relating to director duties and corporate reporting requirements.

AEMO's Board of Directors (except the Managing Director) are appointed by eligible members of the ECMC from a recommended shortlist put together by an independent selection panel. The CEO and Managing Director is appointed by the Board of Directors.

The roles, responsibilities, and powers of the AEMO Board are set out in [AEMO's Constitution](#) and the Board Charter. The Board of Directors oversees AEMO's work to ensure that the company meets its corporate objectives and responsibilities, while complying with relevant laws and regulatory regimes.

The AEMO Constitution provides that there can be between five and 10 directors, and that a majority of Directors (including the Chair) must be independent and that at least three but not more than six directors must have industry experience. The Constitution sets out a detailed test for assessing independence, which in summary requires that an independent director must be free of any business or other relationship that could be perceived as materially interfering with their unfettered and independent judgment as a director and not be a member of management.

AEMO's Board currently includes 10 Directors: the independent non-executive Chair, the Managing Director and CEO, and eight other non-executive directors (five who are independent and three who have current industry experience and are therefore regarded as non-independent).



As with any not-for-profit company limited by guarantee, AEMO has members of the company. AEMO's corporate membership is split between government (60%) and industry (40%). Industry members comprise registered participants in the energy markets AEMO operates who apply for membership, including generation and production, transmission, and retail businesses across Australia. Members have two key roles as part of AEMO's corporate governance:

- First, in appointing directors, members vote on the independent selection panel's report ahead of the report going to the Ministerial Council.
- Second, members are required to vote on proposed changes to AEMO's Constitution or structure, including a disposal of its business or merger with another company.

Members have no role in the exercise of AEMO's statutory functions.

As at October 2024, AEMO has 94 industry members. The eligibility criterion to be an industry member is an organisation that is registered as a participant in an energy market or information service that AEMO operates. This includes registered participants under the National Electricity Law or National Gas Law; a service provider under the National Gas Law; persons required to provide information to the Natural Gas Bulletin Board; and participants in the Western Australian WEM and gas services. A list of industry members is available on [AEMO's website](#). Many registered participants do not choose to become members of AEMO.

Performance of statutory functions

AEMO's functions are prescribed in legislation, including the National Electricity Law, the National Gas Law, and the National Energy Retail Law, as well as Western Australian legislation including the Electricity Industry (Wholesale Electricity Market) Regulations 2004 WA, the Wholesale Electricity Market Rules (WA) and the Gas Services Information Rules (WA).

As noted above, AEMO's Board of Directors is the only decision-making body that is responsible for the performance of AEMO's statutory functions. AEMO's members cannot override the Board in relation to decisions about the performance of AEMO's statutory functions, and this is detailed in AEMO's Constitution.

If the AEMO Board is considering an issue where a Director may have a conflict of interest, for example a non-independent director with regards to a market participant that they have a relationship with, they are excluded from all information and discussion for that topic and do not vote.

Ministerial Council oversight

The NEM and east coast gas markets are underpinned by a co-operative legislative scheme governed by the Australian Energy Markets Agreement (AEMA), entered into under the auspices of COAG. The AEMA establishes a Ministerial Council, consisting of the Energy Ministers of the Commonwealth and all of the States and Territories, as the national policy and governance body for the Australian energy market (including for electricity and gas). This is now known as the Energy and Climate Change Ministerial Council (ECCMC).

Eligible members of the ECCMC appoint directors to AEMO, except for the Managing Director and CEO. The ECCMC has also issued a [statement of role](#) for AEMO. AEMO is accountable to the ECCMC rather than to any one Minister and has an obligation to report on its performance, budget, key priorities, and emerging issues. AEMO regularly attends ECCMC meetings to report to Ministers.



AEMO's annual budget

AEMO operates on a not-for-profit cost-recovery basis. As part of our commitment to transparency, AEMO annually drafts, consults on and publishes an [annual budget](#), which reflects the anticipated costs of our legislated work to operate today's energy markets and prepare for the energy future. It includes the costs of delivering the priorities set out in AEMO's annual strategic corporate plan.

Finances are managed across a number of business segments, which incorporate the activities of AEMO's subsidiaries. AEMO's business segments are aligned with sources of funding in accordance with AEMO's financial principles. While the majority of AEMO's business segments are funded by fees and charges paid by relevant registered market participants, AEMO's cost recovery also includes grants, fee-for-service activities, and contracts with state and federal governments.

In FY25, AEMO's segments are NEM Core, NEM Functions, NEM Connections, East Coast Gas, WA Electricity and Gas, Victoria Transmission Network Service Provider, Commonwealth Investment Scheme and NSW Roadmap.

For those activities funded by participant fees, AEMO determines fee structures in consultation with stakeholders, including which participants are charged each fee and the method of calculating costs allocated to participants. The fee structures for Western Australia's WEM and Gas Services Information (GSI) functions are set in accordance with the relevant rules governing the Western Australian market.

AEMO's budgeted operating costs for FY25 are \$739 million, with budgeted revenue requirements of \$755m. Revenue requirements are determined in the annual budget, based on prior agreed fee pathways, and reflect recovery of operating costs adjusted for any accumulated surplus/deficit carried forward. This accounts for the variation between the budgeted operating costs and revenue requirement in FY25.

FY25 Strategic Corporate Priorities

AEMO's strategy is set out in its [FY25 Strategic Corporate Plan](#), which represents AEMO's statement of corporate intent. The FY25 Strategic Corporate Plan identifies four key strategic priorities:

- Operating today's systems and markets,
- Navigating the energy future,
- Engaging our stakeholders, and
- Evolving the way we work.

For FY25, within that framework, four prominent streams of work include: cyber, digital and IT; the ISP; technical steps to run the grid with 100% renewables by 2025; and improving our operational capabilities.

The Strategic Corporate Plan outlines specific initiatives against each of the strategic priorities and identifies performance measures. Each year AEMO's [Annual Report](#) records progress delivered against the initiatives and performance measures. AEMO hosts an annual results presentation following publication of the Annual Report to engage stakeholders on our performance for the year. A video recording of the presentation, and a results slide pack, are published on the [AEMO website](#).



SECTION TWO: INTEGRATED SYSTEM PLAN

Origin of the ISP

The market operator has always had system planning responsibilities in the NEM. Initially, AEMO's predecessor undertook annual interconnector reviews and assessed proposed regulated interconnectors. In 2009, new national transmission planning functions were conferred on AEMO, which involved preparing and publishing regular National Transmission Network Development Plans.

The 2017 Finkel Review recommended AEMO develop an integrated system plan. Energy Ministers adopted new rules which set out the basis on which the ISP would be prepared every two years. The first ISP was published in 2018 and AEMO has prepared and published an ISP every two years since then.

Legislative framework

AEMO's functions as the National Transmission Planner (NTP) are set out in the National Electricity Law and the NER.

The legislative framework to prepare the ISP is highly prescriptive. The provisions set out the ISP's purpose, power system needs that must be achieved by the ISP, AER guidelines that AEMO must apply in preparing the ISP, and a range of requirements in relation to stakeholder engagement, communications, and the content of the plan. Following development of the initial ISP Rules, the [AER developed guidelines](#) for forecasting and the cost benefit analysis in the ISP, which AEMO must also follow in consulting on and preparing the ISP.

Government policy

The ISP is a plan for the development of the NEM power system to meet reliability and security needs and to support the achievement of the National Electricity Objective (NEO). It sets out the required generation, firming, and transmission infrastructure to transition the NEM in a manner that reflects current government policy settings. In accordance with the NER, AEMO must model the policies in the AEMC's Emissions Targets Statement (governments' emissions reduction targets) and may also model additional policy that meets certain criteria.

The ISP development process

AEMO develops the ISP over a two-year process through a rigorous integrated modelling process and extensive consultation with industry, government, and consumer advocates. The development of the ISP is a complex, multi-stage process, which is set out at a high level in Figure 1 below (the content in Figure 1 is illustrative and not exhaustive).

AEMO undertakes a number of preparatory steps under the rules in developing the ISP. This includes publishing an ISP Methodology and an Inputs, Assumptions and Scenarios Report (IASR), which is prepared in accordance with the AER's Forecasting Best Practice Guidelines.

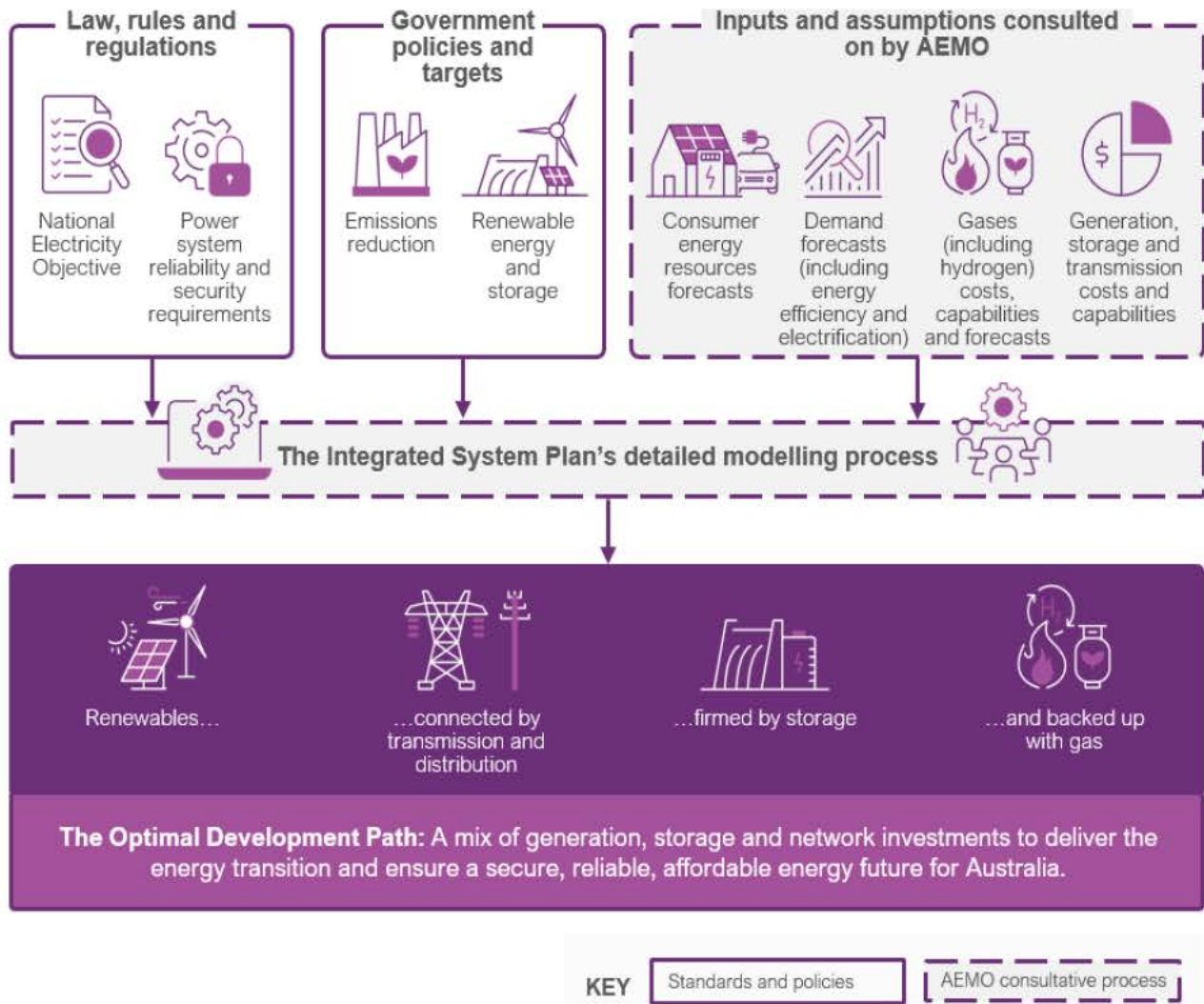
The IASR provides a range of inputs including consumer investment in their own energy systems, energy efficiency, electrification of transport, heating, cooling, and cooking, hydrogen industry development, costs for new transmission, generation and storage technologies, and inclusion of projects already underway for delivery.

When developing the draft and final ISP, AEMO applies the ISP Methodology in accordance with the AER's Cost Benefit Analysis Guidelines. The ISP explores a broad range of future scenarios to determine an Optimal Development Path (ODP) for the NEM, which is the product of AEMO's integrated modelling process, and

represents the optimal mix of generation, storage, and transmission to meet the NEM power system's reliability and security needs, in alignment with the policies, and at the lowest system cost. The ODP sets out the optimal size, place, and timing for the NEM's future assets based on the inputs.

Throughout the process, extensive consultation is undertaken as is required under the rules, including on the Draft ISP Methodology, Draft IASR and the Draft ISP itself.

Figure 1 The ISP development process



The 2024 ISP

AEMO published its [2024 ISP](#) on 26 June 2024. In recognition of the widespread interest in the ISP, AEMO also published a 2024 ISP Overview and a 2024 ISP Fact Sheet to make a summary of the key findings of the ISP accessible to a broad audience.

The 2024 ISP sets out the new grid-scale and consumer owned generation, firming storage and transmission needed in the NEM and has an annualised capital cost of \$122 billion to 2050.



The 2024 ISP includes several updates to transmission projects from the 2022 ISP. Seven additional transmission projects were identified as ‘actionable’ since the 2022 ISP, either triggering the RIT-T process for ‘actionable ISP projects’ progressing under the NER or highlighting that these projects are positioned to progress under jurisdictional frameworks. Identifying these projects now will allow time for coordinated and effective community consultation to commence.

Without the transmission projects identified in the 2024 ISP, consumers would pay more for electricity. Over the period to 2050, the transmission projects are expected to recoup their \$16 billion investment costs, save consumers a further \$18.5 billion in avoided costs, and deliver emissions reductions valued at \$3.3 billion.

Next steps

Under the NER, the ISP also serves a specific regulatory purpose in triggering statutory requirements for proposed transmission projects identified in the ODP in the ISP as “actionable ISP projects”. The relevant TNSP for an actionable ISP project must apply the AER’s Regulatory Investment Test for Transmission (RIT-T) to the project in accordance with relevant NER provisions and AER guidelines.

The main purpose of the RIT-T is to require the TNSP to identify the “preferred option”, which the NER defines as the credible option that maximises the present value of net economic benefit for consumers. Following completion of the RIT-T, the TNSP must obtain AEMO’s confirmation that the preferred option remains aligned with the ODP in the most recent ISP before applying to the AER for a revenue determination.

Investment in other aspects of the ODP are subject to the decisions of developers or other market participants.

Engagement on the ISP and role of the ISP Consumer Panel

AEMO conducts extensive consultation to put together the ISP in accordance with requirements under the NER and the [AER’s Forecasting Best Practice Guidelines](#).

To develop the 2024 ISP, AEMO engaged stakeholders regularly over two years from July 2022 to June 2024, with multiple opportunities for stakeholder input. Over that period AEMO engaged over 2,100 stakeholders, gave 85 presentations to stakeholders through five consultation stages, and considered 220 written submissions.

The focus of our engagement commenced with consulting on inputs, assumptions, and scenarios, and how they are applied in ISP modelling. This was followed by engagement on the findings of the Draft 2024 ISP and AEMO’s reasoning, considerations and analysis supporting the selection of the ODP. Feedback from stakeholders was carefully considered and adopted where appropriate, as detailed in the [2024 ISP Consultation Summary Report](#).

Under the NER, AEMO is required to establish a dedicated ISP Consumer Panel that must consist of at least three members appointed by AEMO who are suitably qualified to assess the ISP and have experience representing consumer interests. The 2024 ISP Consumer Panel supported AEMO to bring a consumer-focused perspective to the development of the 2024 ISP and collaborated with AEMO throughout the consultation process.

The ISP Consumer Panel made a range of recommendations in relation to the preparation of the ISP and has suggested improvement opportunities for the 2026 ISP process. AEMO has evaluated the feedback from both the ISP Consumer Panel and the broader stakeholders engaged in development of the 2024 ISP, which included increasing the amount of notice for engagement, improving our communication of complex material, and improving our engagement listening. This feedback is detailed and has been implemented in our [engagement strategy for the 2026 ISP](#).



The ISP and the National Electricity Objective

AEMO set out in the 2024 ISP how it has regard to the NEO as follows.¹

The ISP supports the National Electricity Objective

The ISP must achieve power system needs and contribute to achieving the National Electricity Objective, which is:

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

- price, quality, safety, reliability and security of supply of electricity; and
- the reliability, safety and security of the national electricity system; and
- the achievement of targets set by a participating jurisdiction for reducing... or that are likely to contribute to reducing Australia’s greenhouse gas emissions.”

This section considers each of these objectives. AEMO uses the term ‘affordability’ to refer to the ‘price and quality’ elements of the National Electricity Objective, and to align with the ‘affordability’ objective featured in Australian and state energy policies.

Reliability and security as ‘power system needs’

The NEM power system needs to be reliable and secure, operating within engineering limits and operating standards, as shown in Table 2.

Table 2 Power system needs considered in the ISP

Need	Operational requirements considered when developing the ISP	
Reliability	Resource adequacy and capability	Continuous real-time balancing of supply and demand. In addition, energy resources provide sufficient supply to match demand from consumers at least 99.998% of the time under the NEM Reliability Standard.
		Reserves exist to provide ‘a buffer’ – available to assist in meeting electricity demand in challenging conditions.
		Network capability is sufficient to transport energy to consumers.
Security	Frequency and inertia	Frequency control, minimum and secure levels of system inertia, and transient and oscillatory stability are maintained within operating and planning standards.
	Voltage management and system strength	Voltage control and fault levels are maintained within operating and planning standards and below equipment ratings.
	System restoration and flexibility	The right mix of flexible resources are available to maintain and restore the supply-demand balance across different timescales.

To be reliable, the NEM must match supply with demand from consumers while keeping power system equipment within its operating requirements. In addition, the NEM must be operated over the year so that there is enough supply to make sure demand is met at least 99.998% of the time. To meet both of these

¹ This is Section 3.2 of the 2024 ISP – refer AEMO’s website

needs, reserves may be required to respond to demand peaks during periods of extreme heat or cold or to cover potentially long periods of dark and still ‘renewable droughts’ across the NEM.

To be secure, the system must continue to operate within defined technical limits despite highly variable demand and renewable supply, even if a major power system element (such as a generator or interconnector) is unexpectedly disconnected. If such an element fails, the system must be returned to secure operations as soon as practical, within 30 minutes.

Appendix 4 and Appendix 7 discuss more completely how system reliability and security are being provided through to 2050, although the issues are touched on throughout the ISP.

Affordability as ‘long-term interests and net market benefits’

‘Affordability’ is considered in the ISP’s purpose to serve ‘the long-term interests of electricity consumers’, taking into account the ‘price, quality, safety, reliability and security’ of supply¹. This is measured by the ‘net market benefits’ that a development path may bring, which are in turn driven by ‘low long-term system costs’. The lower those long-term costs are, all else being equal in an efficient market, the lower energy prices will be.

The benefits and costs considered in the ISP are set out in the *2023 ISP Methodology*. Unless otherwise indicated, they are assessed for all utility-scale generation, firming and transmission infrastructure in the NEM, and include the value of greenhouse gas emissions reductions (VER): see Section 3.3 below.

AEMO notes, however, that lowering long-term system costs generally means investing in new assets, generally up front. This means short-term affordability is only protected if investments are repaid over long-term schedules that do not penalise current consumers. The ISP assumes that these payment schedules are adopted by investors and reflected in wholesale energy markets.

Table 3 Classes of market benefits considered in the ISP cost-benefit analysis

Benefit	Realised by	Identified by
Operational costs	Low operating costs	Calculating plant maintenance, plant start-up and other operating costs.
	Reduced fuel costs	Co-optimising future generation, storage, and transmission build (and retirement) timings and calculating the fuel costs associated with this generation mix and future dispatch patterns.
	Reduced operational curtailment	Calculating the value to the customer of either voluntary curtailment or involuntary load shedding.
	Reduced network losses	Assessing additional generation costs effectively wasted due to network losses under each alternate development path across interconnectors.
Capital cost	Efficient investment timing	Investments being delivered in time for when they are needed and deferred if they are not yet required.
	Optimal investment size	Total generation, storage, and transmission costs, compared to the case of no new transmission.
Reduced emissions	Valuation of reductions	Value of greenhouse gas emission reduction (VER) for years 2023 to 2050 as agreed by Australia’s Energy Ministers and set out in the AER Guidance May 2024.

Note: AEMO does not consider ancillary service costs or competition benefits as part of the cost benefit analysis for the ISP because they are not generally material compared to other projects costs, as set out in the *2023 ISP Methodology*. Where material, changes in ancillary service costs may be considered by transmission network service providers (TNSPs) as part of subsequent regulatory investment test for transmission (RIT-T) analysis on any actionable projects.

Balancing affordability and reliability

The ISP is a plan to optimise investment, considering various futures and risks, in a way that achieves system security and reliability at the least long-term cost.

In preparing the ISP, AEMO may apply its professional judgement to reflect consumers' risk preferences. Consumers may seek lower costs, but not at any level of risk. A major challenge for planners is to balance the risks of investment that is 'too early' or 'too late' in an uncertain future. Too early may mean over-investing in things that in the end are not needed. Too late, after waiting for certainty, may mean the system is less able to maintain reliable, secure and affordable power if unpredictable events occur.

In 2023, AEMO surveyed and met in person with residential consumers across the NEM, seeking to understand consumer risk preferences on infrastructure investment. The research suggests that these consumers generally prefer some level of early investment if it will reduce the risk of later volatility in their bills, so long as it is not too much. However, some consumers were willing to pay more, and some were not willing or able to pay anything additional now.

Emissions reduction as an element in the National Electricity Objective

A recent addition of an emissions reduction element to the National Electricity Objective (NEO) in Australia's electricity law requires that AEMO plan the power system in a way that helps governments achieve targets that reduce greenhouse gas emissions, as well as being secure, reliable and cost-effective. AEMO has applied the amended NEO in its preparation of the 2024 ISP as follows:

- Only scenarios that comply with Australian governments' emissions reduction policies have been applied (which meant removing the previous *Slow Change* scenario from the 2022 ISP).
- Policies and targets included in the Australian Energy Market Commission's (AEMC's) *Emissions Targets Statement* have been incorporated, including those which meet the National Electricity Rules (NER) requirements for public policies' inclusion in the ISP. Examples of policies and targets which are on their way to meeting rules requirements are Victoria's offshore wind targets, the Victorian Energy Storage Target, and New South Wales' updated emission reduction targets.
- AEMO has adopted the value of greenhouse gas emissions reduction (VER), agreed by the Australia's Energy Ministers, which rises from \$70 per tonne of carbon dioxide equivalent (CO₂-e) abated in 2024. These reductions are included as a class of market benefits under the NER.

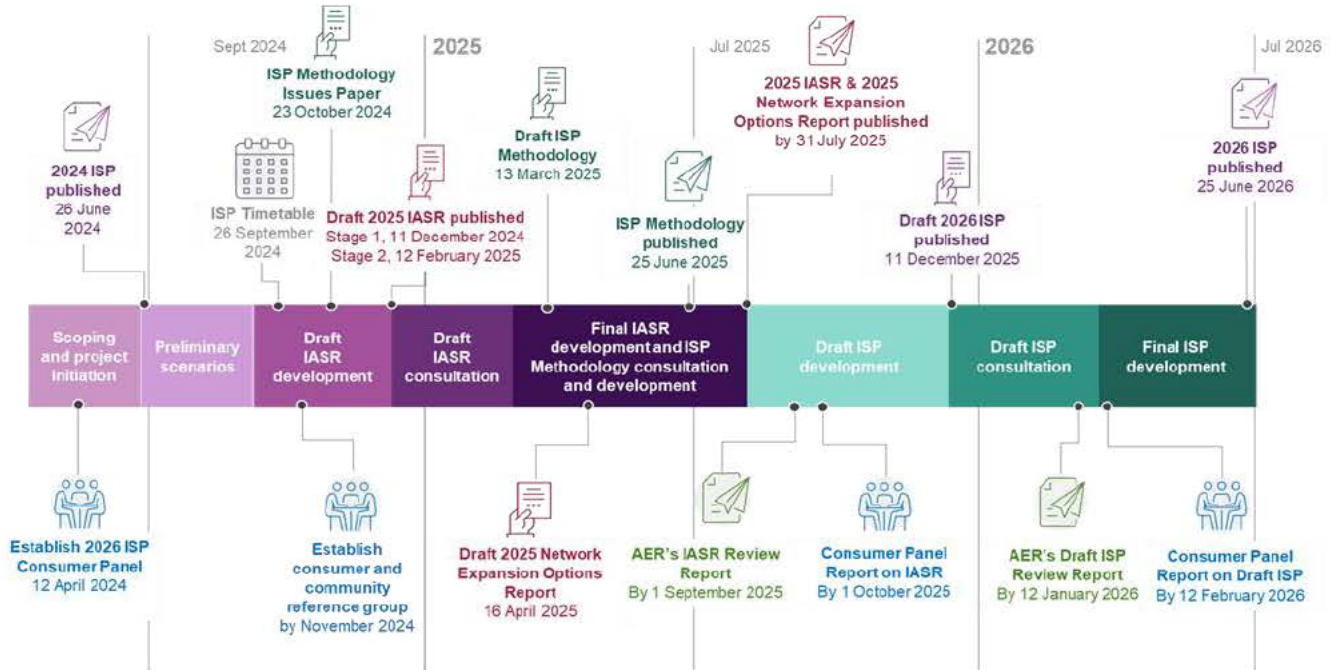
Preparing the 2026 ISP

AEMO has now begun the two-year process to develop the [2026 ISP](#) with publication of the [2026 ISP Timetable](#), [Stakeholder Engagement Plan](#), and will soon commence consultation on the IASR and the ISP Methodology.

The 2026 ISP (and subsequent ISPs) will have an increased scope as a result of the outcomes of the Commonwealth's [ISP Review](#). In April 2024, Energy Ministers agreed to a set of recommendations that expands the approach AEMO is required to adopt in the ISP, including demand forecasting for consumer energy resources such as rooftop solar and electric vehicles, as well as the interactions between electricity and gas.

AEMO is aiming to publish the Draft 2026 ISP for feedback from stakeholders in December 2025, and the final 2026 ISP will be published by 30 June 2026.

Figure 2 The 2026 ISP timeline





SECTION 3: ENGAGING OUR STAKEHOLDERS

Legislative framework

AEMO is subject to a range of statutory requirements in relation to when and how it must consult with stakeholders. For example, in preparing and publishing many AEMO documents under the NER (such as registration guidelines, operational procedures, and methodologies), the rules specify whether AEMO must conduct a consultation process under the Rules consultation procedures.

There are also specific consultation and engagement requirements in relation to several of AEMO's functions under the NER, including the ISP consultation requirements outlined above.

AEMO's approach to stakeholder engagement

In addition to obligations in the rules to consult, AEMO proactively engages with stakeholders on a range of other programs and initiatives that may impact them.

[AEMO's Stakeholder Engagement Framework and Principles](#) sets out the ways in which AEMO seeks to build, maintain, and enhance trust with our stakeholders, and represents AEMO's commitment around what stakeholders can expect when engaging with us.

Engagement with stakeholders occurs through a range of methods, including workshops, industry webinars, briefings, forums, and committees. Our engagement is wide-reaching across the NEM and WEM, with over 50 forums, webinars, and briefings with a combined attendance of over 2,000 stakeholders in FY25 so far. This does not include the many individual interactions that happen throughout AEMO with our stakeholders on a day-to-day basis.

Engaging with consumers

AEMO runs a dedicated consumer forum to provide regular updates and exchange information on key AEMO initiatives for consumer and community advocates, in addition to engaging through other channels. The forum's terms of reference are available on [AEMO's website](#). A meeting summary along with presentation slides are also published after each meeting.

In 2022, AEMO established the [Advisory Council on Social Licence \(ACSL\)](#) to serve as a strategic advisory body to AEMO on social licence related to business planning, policy, reform and advocacy matters. Its 12 members, each well regarded in their respective fields and communities, met quarterly and helped build AEMO's understanding and application of consumer and community perspectives in our thinking and decision-making. Examples include shaping development of a new Social Licence Appendix for the 2024 ISP, and input to various regulatory submissions exploring community acceptance and experiences around new energy infrastructure.

In 2024, ACSL members and AEMO mutually agreed to evolve the ACSL into a new format that allows for more targeted consultation and aligns advocate expertise to specific topics for greater impact on AEMO decision-making and outcomes. AEMO's new [Consumer and Community Reference Group \(CCRG\)](#), established in October 2024, seeks to further bring the views and voices of everyday Australians, businesses, and communities into AEMO. Members will also complement work being led by other key AEMO consultation groups (such as the ISP Consumer Panel) in providing additional, broader voices and context to specific issues. AEMO is currently planning the first set of engagement activities for the CCRG to commence in the second quarter of FY25.



Building greater awareness and understanding of the energy transition

AEMO recognises that increasingly our reports, such as the ISP, are being read by a much broader audience. To ensure AEMO's technical and engineering expertise can be more readily understood by both a technical and non-technical audience, for key reports we also publish an overview or easy explainer document, summarising key findings.

AEMO plays a role in energy education, through the various energy courses we deliver on the NEM, WEM and east coast gas systems. The courses include both introductory overview courses as well as specialised technical courses on specific subjects.

AEMO continues to look for new ways to engage stakeholders, and in March 2024 we launched a new podcast series, AEMO on Air, to provide another way to share the findings of our reports and provide updates on our operations.

Tracking stakeholder engagement performance

We undertake research and benchmarking to monitor and evaluate our impact and reputation with our stakeholders on a yearly basis. For FY24, the overall result for stakeholder trust and confidence was 69.1%, up 5.6% from FY23.



CONCLUSION

AEMO thanks the Committee for the opportunity to make a submission in response to the inquiry's terms of reference. AEMO looks forward to supporting the Committee.



Appendix A: Glossary

Term	Definition
ACSL	Advisory Council on Social Licence
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CAISO	California Independent System Operator
CIS	Capacity Investment Scheme
CCRG	Consumer and Community Reference Group
DTS	Declared Transmission System
DWGM	Declared Wholesale Gas Market
ESOO	Electricity Statement of Opportunities
ERCOT	Electricity Reliability Council Of Texas
GBB	Gas Bulletin Board
GSH	Gas Supply Hub
GSOO	Gas Statement Of Opportunities
GWh	Gigawatt hours
IASR	Inputs, Assumptions, and Scenarios Report
IESS	Integrating Energy Storage Systems
ISP	Integrated System Plan
MW	Megawatts
NER	National Electricity Rules
NEM	National Electricity Market
NEO	National Electricity Objective
NESO	National Energy System Operator
NSW	New South Wales
NTP	National Transmission Planner
ODP	Optimal Development Path
PJ	Petajoules
RIT-T	Regulatory Investment Test for Transmission
REZ	Renewable energy zone
SOCI	Security of Critical Infrastructure
STTM	Short Term Trading Market
TNSP	Transmission network service provider
VAPR	Victorian Annual Planning Report
VGPR	Victorian Gas Planning Report
WA	Western Australia
WEM	Wholesale Electricity Market