

Public



# AEMO Power System Modelling Strategy Consultation

September 2026



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We acknowledge the Traditional Custodians of the land, seas and waters across Australia. We honour the wisdom of Aboriginal and Torres Strait Islander Elders past and present and embrace future generations.

We acknowledge that, wherever we work, we do so on Aboriginal and Torres Strait Islander lands. We pay respect to the world's oldest continuing culture and First Nations peoples' deep and continuing connection to Country; and hope that our work can benefit both people and Country.

AEMO is proud to have launched its Innovate [Reconciliation Action Plan](#) (RAP) in June 2026. Pictured left and featuring on the cover of the Innovate RAP is Wiradjuri artist Lani Balzan's 'Journey of unity: AEMO's Reconciliation Path', a visual representation of our ongoing journey towards reconciliation – a collaborative endeavour that honours First Nations cultures, fosters mutual understanding, and paves the way for a brighter, more inclusive future.

## Important notice

### Purpose

The purpose of this document is to present AEMO's proposed consultation approach and seek stakeholder feedback to inform the development of the Power System Modelling Strategy (the Strategy) and supporting five-year roadmap.

### Disclaimer

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# 1 Power system modelling in the NEM and WEM

## 1.1 Importance of power system models

Power system modelling is fundamental to informed decision-making across the electricity system, with the quality and capability of modelling directly influencing the effectiveness of operational, planning and investment outcomes.

AEMO maintains a broad power system modelling ecosystem spanning steady-state, phasor-domain dynamic, electromagnetic transient (EMT) and small-signal modelling across operational, planning and connection applications. This includes pioneering the use of site-specific models and EMT analysis for system strength assessment, enabling detailed modelling and confidence in operation of the power system with high levels of inverter-based resources across transmission and distribution networks. It is crucial that this broader modelling ecosystem continues to evolve to support the secure and reliable operation of the power systems, both now and into the future, while meeting stakeholder needs and expectations.

AEMO uses modelling data and simulation models to assess technical performance standards and determine power system operational limits. Power system models are used for purposes ranging from assessing the security of the system in real-time operations to developing constraints, limits and designing power system requirements in planning and connection studies. Modelling also enables AEMO to assess the behaviour, system interactions and potential applications of emerging technologies, helping to identify their implications for the secure and reliable operation of the power system. AEMO relies on adequate, accurate and fit-for purpose power system models to fulfil its security and reliability functions.

AEMO recognises that many stakeholders experience modelling issues through practical processes such as connections, operational studies, planning studies, model provision, data requests and guideline compliance. Feedback on these practical issues will be used to inform both the Power System Modelling Strategy (the Strategy) and the forthcoming Power System Model Guidelines (PSMG) consultation.<sup>1</sup>

## 1.2 Relevant risks

**AEMO is currently considering a number of key power system modelling risks.<sup>2</sup>**

Maintaining adequate and accurate power system models requires continual maintenance of existing models, addition of new models or network augmentations, implementation of upgrades to improve efficiency, and the incorporation of new features. These are risks that AEMO is currently considering related to power system modelling:

- **Reliance on third party software packages, models and servers** – there are risks associated with dependence on third parties relating to simulation software, associated tools including compilers, models and adequacy of fit for purpose, high-performance, secure computational hardware.

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<sup>1</sup> See Modelling requirements, at [AEMO | Modelling requirements](#)

<sup>2</sup> See 2026 General Power System Risk Review Report, at <https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/system-operations/general-power-system-risk-review>

- **Challenges in managing model quality and access to a centralised model data base** – it takes significant business effort to maintain a centralised model data base with high quality models. The increasing number and complexity of models further increases the effort required, with potential to reduce business efficiency, and lead to sub-optimal study outcomes if model data quality is affected.
- **Increasing complexity of models resulting in significant, and disproportionate run time increases or potential for modelling errors for simulation of some phenomenon**– the increasing complexity of the power system is leading to increased modelling complexity such as the introduction of models for new generators, BESS, IBLs and DPV. As these models are integrated into the wide-area model, increases in complexity may lead to increased simulation run times. Increased run times degrade the efficiency of using the model and reduce the productivity of users. Increased complexity also introduces potential sources for error.
- **There is a risk that the way modelling requirements are applied, and whether current arrangements remain fit for purpose, may affect the quality, consistency and usability of modelling outcomes.** Stakeholders have raised concerns relating to small-signal modelling, large loads such as data centres, model transparency, software requirements, data quality, model sharing and the usability of modelling information. AEMO is seeking feedback on these issues through this consultation and will consider how they should be addressed through the Strategy, roadmap and future PSMG review.
- **Challenges in maintaining adequate and accurate models.** Models might not be updated in a timely manner and studies are undertaken in the absence of important updates or using superseded information. Revalidation following material plant, control or model revisions can be challenging to manage.

### 1.3 Actions underway

**Actions are currently underway to address power system modelling challenges.** Maintaining accurate power system models is critical to assessment of power system performance and risks in the NEM and WEM. As outlined in the 2026 GPSRR<sup>2</sup>, AEMO is currently progressing a range of actions to identify and resolve power system model issues, including:

- centralising models used for specialist studies to improve usability for a range of studies,
- improving integration of market modelling and engineering analysis tools to support planning for operability,
- evaluating power system analysis tools, analysis approaches and hardware capabilities to ensure that simulation times remain tenable,
- assessing ability to apply tools used in the offline environment in the real time environment, such as emerging use of EMT for online contingency analysis
- continuously reviewing model accuracy and tracking, logging and resolving model data issues in collaboration with network businesses, participants and OEMs,
- routine assessment of model performance against system disturbance events,
- migration to latest software versions to leverage capabilities, and
- provision of modelling information to participants through the data request process, as well as NSPs directly through the AEMO Modelling Platform and provision of Power System Computer Aided Design (PSCAD)<sup>TM</sup> models under 4.6.6.

*Section heading*

Stakeholder feedback on the Strategy consultation will help inform the relative benefits and priorities of the above activities.

As AEMO continues to uplift its modelling capabilities where possible to best support system security in the NEM and WEM, we are seeking input from stakeholders to help inform our short, medium and long-term actions.

## 2 Development of a modelling strategy

### 2.1 Rational

The Electric Power Research Institute (EPRI) is undertaking an independent assessment of AEMO's power system modelling capabilities. The assessment draws on internal AEMO documents, external publications, interviews with AEMO subject-matter experts and, through this consultation, feedback from external stakeholders. As part of the assessment, EPRI is identifying potential gaps in AEMO's current modelling capabilities, benchmarking those capabilities against relevant practices adopted by international system operators, and providing recommendations to inform AEMO's Power System Modelling Strategy and supporting roadmap.

This work responds to the increasing complexity of the power system, including higher levels of inverter-based and distributed energy resources, the emergence of new technologies, and the need for more detailed and computationally demanding studies across planning, connections and operations.

The development of the Strategy is a multi-phase program of work intended to position AEMO's modelling capabilities for a rapidly evolving operating environment across the NEM and WEM over the next five to 10 years. The Strategy will support AEMO's capability development, investment prioritisation and operational needs, while providing greater clarity to industry on the future direction of AEMO's modelling capabilities, governance arrangements and stakeholder engagement.

### 2.2 Scope

The Strategy intends to focus on the core software tools, processes and data requirements necessary to undertake credible simulations of the wide-area networks which make up the NEM and WEM across a range of time frames and power system phenomena.

In-scope are the simulation requirements needed to accurately study:

- Steady state behaviour of the network.
- Short circuit characteristics of the network.
- Dynamic behaviour of the network in the time domain.
- Dynamic behaviour of the network in the frequency domain.

Out of scope are simulation tools, specialised data sets and processes needed to study:

- Power system harmonics.
- Sub-synchronous torsional interactions (SSTI).
- Insulation coordination.
- Electromagnetic Compatibility and Interference (EMC/EMI)

## 2.3 Strategy framework

Drawing on the assessment and benchmarking undertaken to date, EPRI has proposed the following Vision to guide the development of AEMO's Power System Modelling. The draft Vision describes the intended future state for AEMO's power system modelling capabilities over the five-year roadmap horizon. It positions modelling as an enabler of AEMO's broader responsibilities to consumers and stakeholders across the NEM and WEM, rather than as a technical objective in isolation.

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*A future-proof, secure, and integrated power system modelling strategy that supports delivery of reliable, affordable, and sustainable energy system to customers in a changing environment by implementing focused automation, governance, usability and training.*

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Three characteristics of the Vision warrant emphasis. First, it is outcome-oriented: modelling capability is positioned as a means of delivering reliable, affordable, and sustainable service, rather than as a technical objective in isolation. Second, it is future-proof: it recognizes that the operating environment is changing as inverter-based resources, DER and CER, large new loads, and new participants continue to reshape system behavior. Third, it identifies the three principal levers through which the uplift will be achieved: automation, governance, and training.

A modelling strategy should support consistent application of validated and reliable data in a manner that supports end user needs enabling them to produce credible, repeatable outputs in an efficient manner across a range of simulation platforms which are fit for purpose to investigate the phenomena of concern.

EPRI has identified a number of issues, risks and opportunities, and is proposing seven focus areas for the Strategy as outlined below. The descriptions present the intended direction for each area and will be further tested and refined through consultation. The focus areas are not finalised and may be revised based upon stakeholder feedback.

- **Focus area 1: Modelling Tools**  
AEMO and industry have access to the right modelling tools at the right time and apply a consistent, risk-based approach to selecting the appropriate modelling domain, model and analytical method for each study question and intended decision. This enables NEM and WEM modelling teams to undertake the required range of studies efficiently and without compromising scale, speed or fidelity.
- **Focus area 2: Model Configuration Management**  
AEMO has consistent guidelines, procedures and systems for managing power system models throughout their lifecycle, from creation and validation to use, revision and retirement. A consistent source of truth makes models trusted, traceable and readily transferable across planning, connections and operations in the NEM and WEM.
- **Focus area 3: Computational Capability and Hardware**  
AEMO has access to the appropriate computational capability when and where it is needed, enabling modelling teams across the NEM and WEM to undertake required studies without unnecessary constraints on scale, speed or fidelity.
- **Focus area 4: Models and Data**  
AEMO maintains a coordinated, end-to-end model and data ecosystem covering generation, networks, distributed energy resources (DER), consumer energy resources (CER) and large loads across the NEM and WEM. Models and data

are supported by appropriate monitoring, validation and continuous improvement, with associated uplift, where needed.

- Focus area 5: Process Improvement, Automation and Efficiency

AEMO's modelling processes are efficient, repeatable and appropriately automated, enabling consistent practices across the NEM and WEM. Automation and emerging technologies, including artificial intelligence where appropriate, reduce repetitive manual effort and allow modelling specialists to focus on higher-value engineering analysis and decision-making.

- Focus area 6: Regulatory, Stakeholder and Vendor Engagement

AEMO undertakes coordinated and transparent engagement with regulators, NSPs, OEMs, proponents and other stakeholders. This engagement supports the continued development of regulatory arrangements, standards, guidelines and modelling practices needed to maintain the reliability, security and adaptability of the NEM and WEM.

- Focus area 7: Training and Development

AEMO and its broader modelling ecosystem are supported by skilled and future-ready people. This area may include structured technical training, clearly defined capability and career pathways, knowledge-transfer and succession arrangements, and opportunities for practical experience in emerging modelling methods.

Particular attention may be given to specialist capabilities such as electromagnetic transient modelling, automation, advanced analytical methods and the modelling of inverter-based resources. The focus area will also consider how AEMO can retain critical knowledge internally while supporting capability development across NSPs, OEMs, project proponents and other industry participants in the NEM and WEM. The specific initiatives will be developed further through consultation and the preparation of the final roadmap.

Taken together, the seven focus areas form a coherent operating model for AEMO's modelling capability. Areas 1 through 4 address the technical core, covering tools, configuration, compute, and models and data. Area 5 addresses how the work is executed. Areas 6 and 7 address the human and institutional dimensions on which sustained improvement depends.

### 3 Consultation approach and delivery timelines

AEMO is committed to transparent engagement throughout the development of the Power System Modelling Strategy. Based on feedback received through consultation on this Consultation Paper, AEMO will continue to engage with a broad range of stakeholders to ensure the Strategy is well understood and informed by relevant industry perspectives. Stakeholders are invited to provide written submissions to [modelling@aemo.com.au](mailto:modelling@aemo.com.au) by **14 October 2026**, participate in the public webinar and contribute through targeted engagement activities. AEMO intends to publish a draft Strategy and supporting roadmap for further consultation in **November 2026**, followed by publication of the final Strategy and roadmap in December 2026.

During the consultation period, AEMO intends to supplement public consultation activities with targeted engagement involving stakeholder groups that are directly affected by modelling requirements or have specialist modelling expertise. These activities may include workshops, roundtables and focused discussions intended to test key assumptions, better understand stakeholder needs and challenges, explore potential options and priorities, and inform development of the draft Strategy and roadmap before preferred approaches are finalised.

Where appropriate, these activities will provide opportunities for stakeholders to provide feedback on future priorities, roadmap actions and implementation considerations. Feedback can also be provided outside the consultation period at any time.

#### Relationship between the Strategy and the PSMG

The Power System Modelling Strategy and the Power System Model Guidelines (PSMG) serve different but complementary purposes. The Strategy will establish AEMO's longer-term vision, priorities and roadmap for power system modelling capability, including consideration of tools, governance, data, processes, stakeholder engagement and workforce capability.

The PSMG provides the formal framework for power system model and information requirements under the National Electricity Rules. It establishes the technical and procedural requirements for the provision, management and use of modelling information.

Outcomes of the Strategy may identify areas where current modelling requirements, processes or governance arrangements should be reviewed. Where appropriate, these matters may subsequently be considered through the PSMG consultation process. Feedback received through this consultation will therefore help inform both the development of the Strategy and the scope of future PSMG consultations, which will be undertaken separately.

The Strategy is intended to provide a medium to long-term direction of travel and would be reviewed periodically, whereas the PSMG may be updated as required to reflect evolving modelling requirements, industry experience and regulatory obligations.

#### Relationship to other industry initiatives

AEMO notes that a number of related industry and regulatory initiatives (such as the NEM 'open model' Rule change consultation) may also consider issues relevant to power system modelling, transparency and information sharing.

Feedback received through this consultation will help inform AEMO's contribution to those discussions, while outcomes from relevant external processes will also be considered in the development of the final Strategy and future PSMG review.

### How will the modelling strategy be developed?

- EPRI has prepared a list of critical focus areas it believes need to be addressed as part of developing a Power System Modelling Strategy.
- AEMO's intent is to seek feedback on the focus areas presented in this document to ensure industry alignment.
- A questionnaire (see Table 1) has been developed to explore additional issues of relevance.
- EPRI will prepare a draft Strategy which it will seek feedback on through a consultation process.
- A final Strategy will be presented to the Power System Modelling Reference Group (PSMRG) which is convened under the National Electricity Market Operations Committee (NEMOC).
- Following consultation, AEMO intends to publish a summary of stakeholder feedback and how it informed development of the final Strategy and roadmap.

## 3.1 List of consultation questions

Table 1 outlines key areas of this paper on which AEMO is seeking industry feedback. AEMO also welcomes feedback on any other aspect of the proposed approach described in this paper.

**Table 1 Key consultation questions**

| Question                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Section                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 1. What is your perspective on the current strengths of power system modelling capability in the NEM and/ or WEM? What do you see as potential areas for improvement? Where possible, please relate your observations and experience to how it enables (or inhibits) your role and objectives in the industry.                                                                                                                                                                                                                              | 2.3                    |
| 2. In your view, do the presented focus areas appropriately capture and group relevant matters to be considered in the Strategy?                                                                                                                                                                                                                                                                                                                                                                                                            | 2.3                    |
| 3. As power system studies become increasingly complex and computationally heavy, are there any current or future issues, behaviours or phenomena that may not be adequately captured by existing suite of simulation tools, modelling approaches, model formats or data fidelity? Please also identify any limitations of AEMO's current modelling tool choices, including interoperability, accessibility, proprietary software requirements, usability, or model format constraints, and any changes needed to meet future requirements. | 2.3 (Focus area 1 & 4) |
| 4. If you use modelling information provided under NER 3.13.3 – does the accuracy, completeness and usability of these models meet your current and future needs?                                                                                                                                                                                                                                                                                                                                                                           | 2.3 (Focus area 2)     |

| Question                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Section            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 5. Can stakeholders identify instances where computational requirements created a material constraint or challenge, and where an alternative approach could have delivered the same study objective with lower computational effort or shorter execution times? ? With the influx of connections into the NEM, do you foresee a stage where the computational requirements are too heavy to be practical? Please provide specific details regarding the software, simulations and models used when providing feedback. | 2.3 (Focus area 3) |
| 6. What do you see as the potential benefits, limitations and practical implications of specifying the provision of vendor-agnostic models by proponent (or other types of participants). Please also comment on any confidentiality, intellectual property, validation or implementation considerations associated with vendor-agnostic models.                                                                                                                                                                       | 2.3 (Focus area 4) |
| 7. What opportunities do you see for process improvement and automation across the power system study lifecycle, including model configuration, case building, study execution, quality assurance, results processing, and engineering interpretation, and what are the expected benefits, key implementation barriers, assurance and governance requirements, and appropriate levels of human oversight associated with automation in each of these areas?                                                            | 2.3 (Focus area 5) |
| 8. Do current regulatory arrangements, guidelines, forums and engagement channels effectively support the industry's modelling capability? Are there stakeholder groups, including OEMs, consultants, NSPs, proponents or large-load developers, that AEMO should engage differently?                                                                                                                                                                                                                                  | 2.3 (Focus area 6) |
| 9. Do you have any feedback regarding training and development required to enable power system studies in the NEM and WEM?                                                                                                                                                                                                                                                                                                                                                                                             | 2.3 (Focus area 7) |
| 10. Are there any material risks or ongoing challenges associated with the current power system modelling software ecosystem, including software licensing, version management, and the availability of alternative software solutions?                                                                                                                                                                                                                                                                                | 2.3 (Focus area 4) |
| 11. Are current model management processes fit for purpose, including roles and responsibilities, model update processes, consistency across modelling platforms, and confidence in model quality and accuracy?                                                                                                                                                                                                                                                                                                        | 2.3 (Focus area 2) |
| 12. What role do you see artificial intelligence (AI) and machine learning (ML) playing in future power system modelling workflows, including case preparation, anomaly detection in simulation outputs, and enhancement of screening and assessment processes?                                                                                                                                                                                                                                                        | 2.3 (Focus area 5) |

## What stakeholders can influence

| Open for feedback      | Not the purpose of this consultation |
|------------------------|--------------------------------------|
| Strategic priorities   | Immediate PSMG amendments            |
| Modelling challenges   | Individual connection disputes       |
| Future roadmap actions | Specific compliance decisions        |
| Emerging issues        | Site-specific modelling outcomes     |

## How feedback will be used

Feedback received through this consultation will be reviewed alongside EPRI's assessment findings and AEMO's operational experience. AEMO and EPRI will consider stakeholder feedback in developing the modelling Strategy, roadmap and future consultation priorities. In assessing feedback, AEMO may consider factors such as impacts on power system security and reliability, stakeholder benefits, alignment with the objectives of the Strategy, implementation feasibility, regulatory considerations and dependencies on other initiatives.

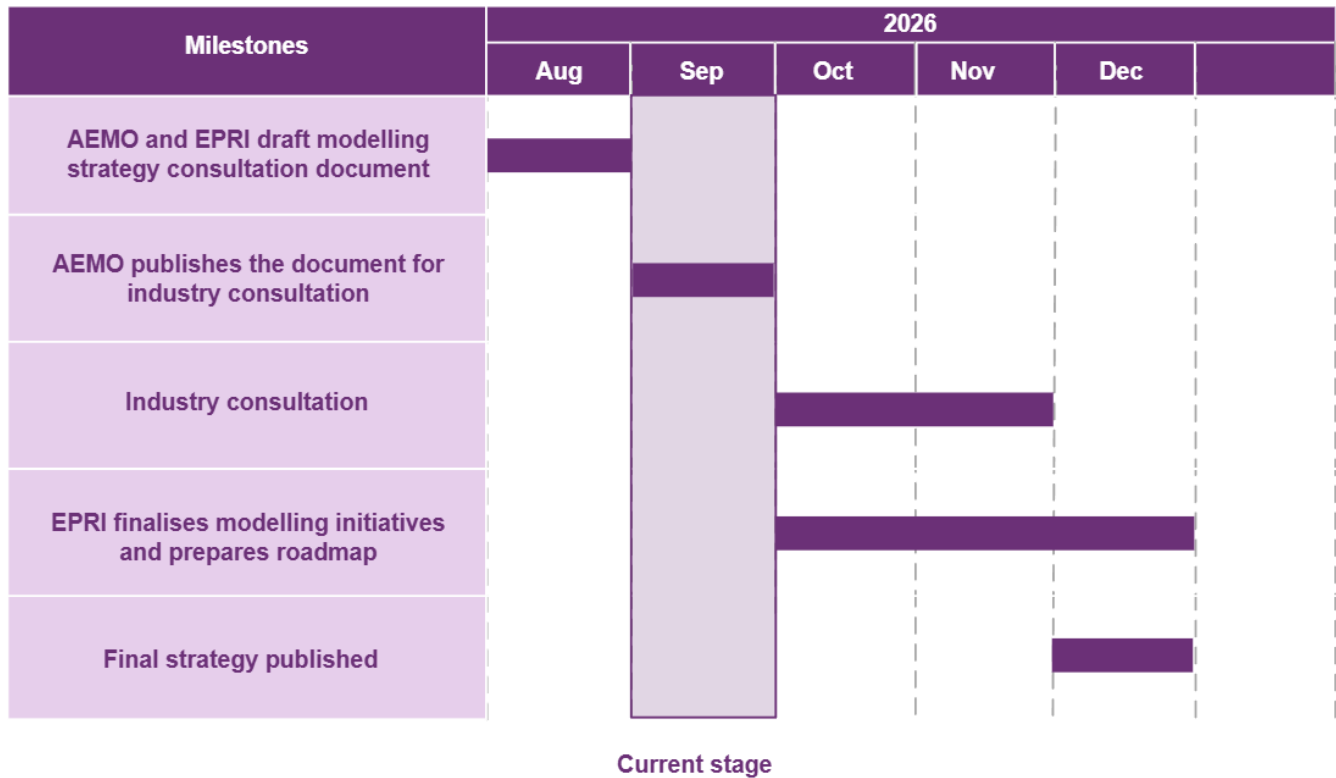
Before making a submission, please read and take note of [AEMO's consultation submission guidelines](#). Unless identified as confidential, submissions may be published on AEMO's website. If a submission contains confidential or commercially sensitive information, please clearly identify the relevant information and the basis for the confidentiality claim at the time of submission. AEMO may publish summaries of stakeholder feedback and how that feedback has informed development of the Strategy.

## Timeline

Figure 1 shows a high-level project schedule for key activities, including the approach paper development and consultation.

At this stage of the project, AEMO has published the strategy approach paper and is accepting written stakeholder submissions in PDF format to [modelling@aemo.com.au](mailto:modelling@aemo.com.au) until 14 October 2026.

**Figure 1 High-level indicative project schedule**



AEMO also intends to undertake a subsequent PSMG consultation in early 2027. The timing and scope of that consultation will be informed by feedback received on this Approach Paper, relevant regulatory requirements and the development of the modelling Strategy roadmap.

This consultation relates to development of the Power System Modelling Strategy and supporting roadmap. Any subsequent consultation on amendments to the PSMG will be undertaken separately and in accordance with the applicable consultation requirements. The timing, scope and consultation approach for any future PSMG consultation will be confirmed at a later date.