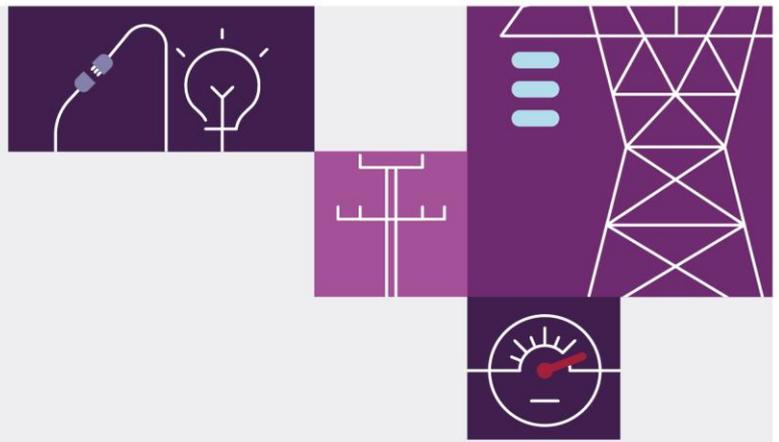


DECLARED NEM PROJECT – NEM 2025 REFORM PROGRAM

May 2022

Consultation Paper





Important notice

Purpose

AEMO is consulting on the determination of the National Electricity Market (NEM) 2025 Reform Program as a declared NEM project in accordance with clause 2.11 and clause 8.9 of the National Electricity Rules (Rules).

This document has effect only for the purposes set out in the Rules, and the Rules and the National Electricity (Law) prevail over this document to the extent of any inconsistency.

This publication has been prepared by AEMO using information available at 11 May 2022.

Disclaimer

This document or the information in it may be subsequently updated or amended. This document does not constitute legal or business advice, and should not be relied on as a substitute for obtaining detailed advice about the National Electricity Law or National Electricity Rules or any other applicable laws, procedures or policies. AEMO has made every effort to ensure the quality of the information in this document but cannot guarantee its accuracy or completeness.

Accordingly, to the maximum extent permitted by law, AEMO and its officers, employees and consultants involved in the preparation of this document:

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Version control

Version	Release date	Changes
#1	11/05/2022	

Executive summary

The publication of this Consultation Paper commences the first stage of the Rules consultation process conducted by AEMO to consider a determination of the National Electricity Market (NEM) 2025 Reform Program as a declared NEM project.

The NEM 2025 Reform Program has been established in order to coordinate delivery of a suite of reforms recommended by the Energy Security Board (ESB) and endorsed by the First Ministers in October 2021, to meet the needs of the energy transition.

Four major areas, or pathways, have been recognised by the ESB and have been designed to ensure immediate problems are addressed and the future direction of the NEM's investment and operation is clear:

1. Resource adequacy mechanisms and ageing thermal retirement.
2. Essential system services and scheduling and ahead mechanisms.
3. Integration of distributed energy resources (DER) and flexible demand.
4. Transmission and access.

To complement the above four pathways, a Data Strategy pathway for the NEM is also required to ensure delivery and implementation of the NEM 2025 Reform Program is seamless.

The reforms outlined above will enable the NEM to:

- Allow consumers to benefit from rapidly changing technologies in our power system;
- Unlock the value of flexible demand and distributed energy resources;
- Work alongside government schemes which are delivering on their policy commitments including emissions reduction; and
- Provide clear signals for timely and efficient investment to deliver reliable, secure, and affordable electricity for consumers.

In order to deliver the above, AEMO has undertaken a preliminary impact assessment and identified that multiple reform initiatives will require IT and business process changes. Initial indicative AEMO implementation costs for the NEM 2025 Reform Program are estimated to be approximately \$250 million-\$330 million with an additional \$9 million-\$18 million for the Data Strategy pathway. These indicative costs excluded a capacity mechanism, congestion mechanism and ongoing operating expenditure costs that may result from the reforms. AEMO is in the process of updating these estimates to reflect the work we have done in partnership with the Reform Delivery Committee.

AEMO has been working with industry through the Reform Delivery Committee to develop an integrated roadmap for NEM regulatory and IT systems implementation (the NEM2025 Implementation Roadmap) to ensure efficient deployment of the NEM 2025 Reform Program so that unnecessary or duplicative costs are avoided. Further information on the NEM2025 Implementation Roadmap can be found on AEMO's website: [AEMO | Regulatory Implementation Roadmap](#).

Declared NEM project

AEMO recovers the costs of performing its functions from Registered Participants. Pursuant to clause 2.11.1(a) of the National Electricity Rules (NER), AEMO recovers costs from Registered Participants in accordance with the structure of Participant fees determined by AEMO. The current Participant fee structure determined by AEMO for electricity markets applies from 1 July 2021 to 30 June 2026. Subject to consultation, the NER allows for AEMO to determine an additional fee to recover the costs of specific projects during the term of a Participant fee structure determination (declared NEM project).

Pursuant to clause 2.11.1(ba) of the NER, AEMO may determine any of the following projects to be a declared NEM project:

- a major reform or development (including an anticipated reform or development) of the market; or
- a major change (including an anticipated change) to a function, responsibility, obligation or power of AEMO under the Rules; or
- a major change (including an anticipated change) to any of the computer software or systems that AEMO uses in the performance of any of its functions, responsibilities, obligations or powers under the Rules.

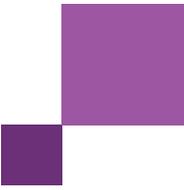
When AEMO determines a project to be a declared NEM project under clause 2.11.1(ba), it must also determine the start date for recovery and the period or periods over which recovery will occur for the declared NEM project.

AEMO must also determine the structure of an additional Participant fee to be used in the recovery of costs associated with a declared NEM project until the next general determination of all Participant fees is made under clause 2.11.1(a) of the NER.

AEMO has prepared this Consultation Paper to consult on whether to determine the NEM 2025 Reform Program as a declared NEM project.

Stakeholders should note that this consultation relates only to determining whether the NEM 2025 Reform Program should be a declared NEM project. The structure for an additional Participant fee for recovery of the costs of the project including the Registered Participants that will be charged the fee, as well as the start date for recovery and the period or periods over which recovery will occur, will be determined in a separate, subsequent consultation.

Stakeholders are invited to submit written responses on the issues and questions identified in this paper by email to kevin.ly@aemo.com.au by 5.00 pm (Australian Eastern Standard Time [AEST]) on 15 June 2022, in accordance with the Notice of First Stage of Consultation published with this paper.



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1 Stakeholder Consultation Process

As required by the NER, AEMO is consulting on whether to determine the NEM 2025 Reform Program as declared NEM project in accordance with the Rules consultation process in rule 8.9.

Note that there is a glossary of terms used in this Consultation Paper at Appendix A. References in this paper to 'clause x' is a reference to a clause in the NER.

AEMO's indicative timeline for this consultation is outlined below. Dates may be adjusted depending on the number and complexity of issues raised in submissions and any meetings with stakeholders.

Table 1 Consultation timeline

Deliverable	Indicative date
Consultation Paper published	Wednesday 11 May 2022
Submissions due on Consultation Paper	Wednesday 15 June 2022
Draft Report published	Wednesday 13 July 2022 ¹
Submissions due on Draft Report	Wednesday 27 July 2022
Final Report published	Wednesday 7 September 2022

Stakeholders should note that this consultation relates only to determining whether the NEM 2025 Reform Program should be a declared NEM project. The structure for an additional Participant fee for recovery of the costs of the project including the Registered Participants that will be charged the fee, as well as the start date for recovery and the period or periods over which recovery will occur, will be determined in a separate, subsequent consultation.

Therefore, stakeholders should not make submissions to this consultation that relate to the structure of the additional Participant fee for recovery of the costs of the project, the Registered Participants that should or should not be charged, or when that fee will be paid.

An indicative timetable on the separate consultation to determine the actual fee structure for recovery of the costs of the project including the Registered Participants that will be charged and the effective dates of that fee will be included in the consultation paper for that separate consultation. Based on the indicative timeline above, it is expected that the further separate consultation will not commence until September 2022 at the earliest.

¹ This assumes that AEMO concludes that it is not desirable or necessary to hold any meetings under clause 8.9(f) of the Rules (If meetings are held, meetings must be held within a further 25 business days after submissions close, and this will then impact the consultation dates following the meeting)

2 Background

2.1 NER requirements

AEMO recovers the costs of performing its functions from Registered Participants.

Pursuant to clause 2.11.1(a) of the NER, AEMO recovers costs from Registered Participants in accordance with the structure of Participant fees determined by AEMO.

The current Participant fee structure determined by AEMO for electricity markets applies from 1 July 2021 to 30 June 2026.

However, subject to consultation, the NER allows for AEMO to determine a separate fee to recover the costs of specific projects during the term of a Participant fee structure determination (declared NEM project).

Pursuant to clause 2.11.1(ba) of the NER, AEMO may determine any of the following projects to be a declared NEM project:

- a major reform or development (including an anticipated reform or development) of the market; or
- a major change (including an anticipated change) to a function, responsibility, obligation or power of AEMO under the Rules; or
- a major change (including an anticipated change) to any of the computer software or systems that AEMO uses in the performance of any of its functions, responsibilities, obligations or powers under the Rules.

When AEMO determines a project to be a declared NEM project under clause 2.11.1(ba), it must also determine the start date for recovery and the period or periods over which recovery will occur for the declared NEM project.

AEMO must also determine the structure of an additional Participant fee to be used in the recovery of costs associated with a declared NEM project until the next general determination of all Participant fees is made under clause 2.11.1(a) of the NER.

AEMO has prepared this Consultation Paper to consult on whether to determine the NEM 2025 Reform Program to be a declared NEM project.

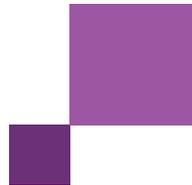
2.2 Context for this consultation

2.2.1 The ESB's Post 2025 Project

The ESB was tasked by the former Council of Australian Governments Energy Council (COAG EC), to advise on design changes required to transition the NEM into a modern energy system fit to meet consumers' evolving wants and needs.

The Post 2025 electricity market design work² has been developed to address the change of expanding consumer choices, new technologies, and large-scale capital replacement as old thermal power stations exit the market. The

² [Energy Security Board | Post 2025 electricity market design project \(aemc.gov.au\)](https://www.aemc.gov.au/post-2025-electricity-market-design-project)



speed of which the change is occurring requires immediate reform so that the benefits and opportunities from changes such as new technologies and other DER can be delivered to consumers.

In July 2021, the ESB recommended a range of reforms under four major pathways to ensure immediate problems are addressed and the future direction of the NEM's investment and operation is clear:

1. Resource adequacy mechanisms and ageing thermal retirement
2. Essential system services and scheduling and ahead mechanisms
3. Integration of distributed energy resources (DER) and flexible demand
4. Transmission and access

To complement the above four pathways, a Data Strategy pathway for the NEM is also required to ensure delivery and implementation of the NEM 2025 Reform Program is seamless.

The above reforms aim to enable the NEM to:

- Allow consumers to benefit from rapidly changing technologies in our power system;
- Unlock the value of flexible demand and distributed energy resources;
- Work alongside government schemes which are delivering on their policy commitments including emissions reduction; and
- Provide clear signals for timely and efficient investment to deliver reliable, secure, and affordable electricity for consumers.

In October 2021, National Cabinet agreed that the ESB proceed with implementation of the recommendations. National Cabinet however sought further advice on a capacity mechanism and congestion mechanism by the end of 2022.

2.2.2 The NEM 2025 Reform Program

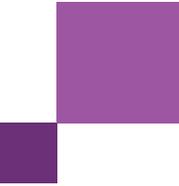
AEMO has identified various initiatives required to deliver the ESB's policy reforms. The majority of these initiatives will be subject to the AEMC's rule change process. To implement these initiatives efficiently and transparently, AEMO, with the support of the AEMC and the AER, established a strategic group of representatives from across the energy sector, the Reform Delivery Committee³. The role of the Committee is to facilitate deep and effective collaboration across the industry to develop a Regulatory and IT implementation Roadmap, the NEM2025 Implementation Roadmap⁴.

This Roadmap appropriately prioritises and sequences reform implementation considering interdependencies with a least-cost whole-of-system intent for the benefit of the consumer, and includes the initiatives that require a significant implementation effort across multiple industry participants.

Table 2 below provides a summary of the initiatives that make up the NEM 2025 reforms, and the scope of this consultation. Please note that the capacity mechanism and congestion management mechanism has not been captured as part of this consultation and will be picked up separately in the event a policy decision is made to proceed with these reforms. All initiatives listed in Table 2 form part of the NEM 2025 Reform Program declared NEM project determination.

³ Representatives of the Reform Delivery Committee can be viewed on AEMO's website: [AEMO | Reform Delivery Committee](#)

⁴ Further information on the consultation of the Roadmap can be viewed on AEMO's website: [AEMO | Regulatory Implementation Roadmap](#)



AEMO has also identified a subset of initiatives that are prerequisites to implementation of the NEM 2025 Reform Program initiatives (see Table 3). These initiatives have been categorised as either AEMO Foundational or AEMO Strategic pathways, and form part of the NEM 2025 Reform Program declared NEM project determination.

Table 2 Reform pathways and their NEM program scope

Pathway	Objective	This means	NEM Program Scope ⁵
Resource Adequacy Mechanism⁶	<ul style="list-style-type: none"> Establish new market-based arrangements to explicitly value capacity to provide an ‘investable’ and enduring long-term signal Establish market arrangements that support efficient allocation of investment risk between participants, jurisdictions, and consumers Establish tools that provide jurisdictions sufficient confidence that reliability will be maintained in a way that preserves market signals 	We have investment in the right mix of resources (generation, storage and demand response) in place prior to anticipated plant closures, and that plant exit does not cause significant price or reliability shocks to consumers through the transition	<ul style="list-style-type: none"> MT PASA Enhancements (Note other reforms are being considered through ESB policy considerations)
Essential System Services	<ul style="list-style-type: none"> Establish new market-based arrangements to value the services needed to support the changing mix of resources in the NEM (frequency, inertia, system strength, and operating reserves) Establish new market mechanisms to support efficient scheduling and dispatch by AEMO Deliver a range of supply and demand-based technologies and resources with capabilities to deliver these essential services 	We have the resources and services when needed to manage the complexity of dispatch and to deliver a secure supply to customers	<ul style="list-style-type: none"> Fast Frequency Response Mandatory Primary Frequency Response Operating Reserve Market System Strength (Planning) Operational Security Mechanism
Integration of DER & Flexible Demand	<ul style="list-style-type: none"> Establish frameworks that enable consumers to be rewarded for their flexible demand and generation, facilitate options for how they want to engage and remain protected by a fit-for-purpose consumer protections framework Establish wholesale market arrangements that support innovation, the integration of new business models and a more efficient supply and demand balance Establish networks with the ability to accommodate the continued update of DER, two-way energy flows, and manage the security of the network in a cost-effective way Provide AEMO with the visibility and tools it needs to continue to operate a safe, secure, and reliable system, including maintaining system security associated with low minimum system load conditions 	We create new opportunities for consumers about how they receive and use energy and are rewarded for doing so flexibly	<ul style="list-style-type: none"> Integrating Energy Storage Flexible Trading Arrangements Scheduled Lite Dynamic Operating Envelops Distribution Local Network Services Turn-up Services DER Data Hub and Registry Services DER Market and System Operator integration

⁵ Further detail on the scope of the reform initiatives have been published on AEMO’s website: [AEMO | Reform Delivery Committee](#)

⁶ The Capacity Mechanism (CM) initiative is not included as part of this NEM 2025 Reform Program declared NEM project determination. If National Cabinet Energy Ministers approve a CM, a separate declared NEM project consultation may be undertaken.

Transmission & Access

- Establish better signals for generators to locate in areas where there is available generation capacity - namely in the REZs
- Reduced uncertainty for investors, through measures that give rise to more predictable future patterns of congestion, and a more orderly and predictable connections process
- Establish better use of the network, resulting in more efficient dispatch outcomes and lower costs for consumers
- Ensure batteries are locating where they are needed most and being paid to operate in ways that benefit the broader system

We have a network to meet future needs, renewable energy zones, and a targeted set of investments that can deliver the energy transition at lower cost

- N/A at this time
(Note other reforms are being considered through ESB/AEMC policy/review considerations)

Data Strategy

- A framework is established with new guiding policy principles, build capability, forward planning and adaptability and address priority data gaps

Varied actors in the market have access to timely data to perform their functions

- Data Services
- EV Charging Standing Data Register
- Bill transparency
- Network Transparency

Table 3 Prerequisite reform pathways and their associated initiatives

Pathway	Description	Initiatives
AEMO Foundational	Foundational dependency work to deliver an uplift to base capability on which reforms are dependent	<ul style="list-style-type: none"> • Identity Access Management • Industry Data Exchange • Operational Data Store • Business Rules Engine • Forecasting Platform Uplift • SCADA Lite
AEMO Strategic	Strategic dependency work to effectively futureproof capabilities and scalability of systems thereby avoiding investment in systems that will become end-of-life shortly after the reforms take effect	<ul style="list-style-type: none"> • Portal Consolidation • CoMaStR • Dispatch Target State • Bids / Offers Target State • Constraints Target State • FRC Target State

3 Discussion

3.1 Declared NEM project

Pursuant to clause 2.11.1(ba) of the NER, AEMO may determine any of the following projects to be a declared NEM project:

- a major reform or development (including an anticipated reform or development) of the market; or
- a major change (including an anticipated change) to a function, responsibility, obligation or power of AEMO under the Rules; or
- a major change (including an anticipated change) to any of the computer software or systems that AEMO uses in the performance of any of its functions, responsibilities, obligations or powers under the Rules.

AEMO may determine a project to be a declared NEM project if the project meets any of these requirements.

The NER does not define ‘major reform or development’ or a ‘major change’ for the purpose of clause 2.11.1(ba) of the NER.

This paper considers whether the NEM 2025 Reform Program would meet any of these requirements to be a declared NEM project, including consideration of the cost of the NEM 2025 Reform Program, the extent of the NEM 2025 Reform Program changes to the Rules, procedures, processes and systems and the impact on AEMO and participants.

As noted above, this consultation does not consider the actual fee structure for recovery of the costs of the project, the Registered Participants that will be charged the fee or when that fee will be paid and therefore, AEMO has not considered matters that are relevant to determining those issues in this paper such as the participants that benefit from the NEM 2025 Reform Program.

If the NEM 2025 Reform Program is not determined to be a declared NEM project, the costs of the NEM 2025 Reform Program will not be recovered by an additional fee structure specifically for the NEM 2025 Reform Program but will be recovered by AEMO in accordance with the current general Participant fee structure determined by AEMO for electricity markets from 1 July 2021 to 30 June 2026 and further general Participant fee structures determined by AEMO.

3.1.1 A major reform or development (including an anticipated reform or development) of the market

The ESB reforms propose to change a number of technical, market and regulatory frameworks to better support and enable the energy transition. The reforms look to address:

- A system once dominated by centralised coal- and gas-fired thermal generation to a system comprised of a diverse portfolio of behind-the-meter and grid-scale inverter-based energy resources as well as a more flexible demand side.
 - This is leading to a reduction in inertia which presents operational challenges associated with maintaining a secure power system and controlling system frequency following contingency events.

- Current system security and operational experience is also being tested as historically synchronous generators supplied essential system services as a by-product of energy, while new non-synchronous generators do not automatically provide these services.
- Higher proportion of loads, aggregated DER and small generators that are active and respond to wholesale market prices are not visible to the system operator and therefore reduce operational oversight and market efficiency.
- Plant operating regimes whereby owners of legacy thermal generation seek to reduce their overheads if low wholesale prices are expected.
 - This can include mothballing of units for prolonged periods of time and/or seasonal shutdowns or cyclical running regimes, for example, weekday/weekend, day/night.
- The need for a high aggregate level of frequency responsiveness (for optimal frequency control outcomes) as there is an increase in price-driven movement in both generation and load, and as the supply mix continues to become increasingly decentralised, inverter-based, and variable.
- Growing forecast uncertainty and variability in net demand over timescales of minutes to hours which results in an increase in lack-of-reserve occurrences as participant behaviour is not always responding to reduce system risk, thereby requiring AEMO intervention.
- Increased demand for system strength as coal- or gas-fired generators retire from the market or operate less frequently, combined with an increase in inverter-based resources such as wind, solar and batteries into the NEM.
 - The current frameworks have been reactive and slow to provide the necessary levels of system strength, leading to deficiencies in this essential service. This has required AEMO to intervene and displace inverter-based resources (IBR) by directing more expensive thermal generation which results in increased costs for consumers.
- An increasing role of energy storage as the shift to a net zero system with very high proportions of variable renewable energy occurs in order to firm up the expanding volume of renewable energy and deliver the growing need for critical system security services as thermal generators retire.
 - The current regulatory framework does not facilitate this shift.
- Increasing need for customers to access competitive products and services for DER, and for DER to be more able to actively participate in the market.
 - Barriers that prevent customers obtaining additional retail arrangements for DER, enabling competition and active management of DER need to be removed or reduced so that customers can be rewarded for providing flexible demand and generation.
- Minimum system load and increased local congestion is driving the need for dynamic limits (rather than static limits) to better manage such issues across the power system.
- Large scale penetrations of DER require greater visibility of local network constraints so that they could be utilised by networks to defer or displace network augmentations, and assist them in actively managing power flows on their networks, or even trading local services between regions.

- The potential for the entire NEM demand to be met with distribution connected resources means that there is a greater need for AEMO, transmission networks operators and distribution system operators (DSOs) to be able to collaborate and communicate in a greater capacity to maintain power system security at such times.
- Lack of market-based measures or incentives for load to respond to low or negative price signals during times of abundant variable renewable energy, which is correlated to periods of minimum system load.

In order to adapt to the above changes occurring in the NEM environment, the regulatory and market frameworks must support the needs of the energy transition. The NEM 2025 Reform Program will identify and implement changes required to the frameworks, for example integrating DER and flexible demand effectively to unlock the value of these resources and to allow consumers to benefit from rapidly changing technologies as well as unbundling essential system services so that clear signals for timely and efficient investment are provided.

Question 1

Do you consider the NEM 2025 Reform Program is a major reform or development of the NEM?

3.1.2 A major change (including an anticipated change) to a function, responsibility, obligation or power of AEMO under the Rules

AEMO's primary role is to perform the functions and exercise the powers given to us under national and Western Australian electricity and gas laws. The functions seek to promote the efficient investment in, and efficient operation and use of, gas and electricity for the long-term interests of Australian consumers in relation to price, quality, safety, reliability and security, which translates to the following areas of responsibility:

- Maintain secure electricity and gas systems.
- Manage electricity and gas markets.
- Lead the design of Australia's future energy system.

While AEMO's areas of responsibilities will not change, there are some NEM 2025 Reform Program initiatives across the reforms that are likely to lead to additional or extended functions and obligations for AEMO. For example:

- Essential System Services – AEMO will play a central role in managing new markets / mechanisms including Fast Frequency Response, Operating Reserves and Operational Security Mechanisms. These new markets / mechanisms will directly impact AEMO's business as usual activities in managing the operation of the power system and require changes to or development of new systems and processes.
- Integrated DER and Flexible Demand – While AEMO will not be at the centre of these reform initiatives, the outcomes (e.g. additional visibility in relation to operation of DER and their technical capabilities) may necessitate amendments to AEMO systems or processes (i.e. registration, ST PASA processes, demand forecasting systems/processes, control room displays and tools) as well as updates to corresponding procedures and guidelines. These initiatives will require greater collaboration between AEMO and DNSPs in order to maintain ongoing power system security, and open up markets further to retailers, aggregators and new business models.

- Data strategy – There are a number of initiatives that will either extend the data sets AEMO has access to in order to better operate the transitioning system and markets, or may require AEMO to provide access to data services to Market Participants and other actors in the energy eco-system.

Additionally, while AEMO is not involved in the definition of distribution local services, scheduling or settlement of local services, it is likely to require visibility of scheduled local services at an aggregated level as the trade of local services grows in scale. Visibility requirements may in turn include amendments to AEMO systems processes (i.e. registration, ST PASA processes, demand forecasting systems/processes, control room displays and tools) as well as updates to corresponding procedures and guidelines.

Further, with the increase in potential times the entire NEM demand could be met with distribution connected resources, collaboration between AEMO and DNSPs will need to increase in order to maintain power system security. This includes understanding the DER operational tools/capabilities that will be required for each party to fulfill their respective roles in the future, and how those tools/capabilities will need to interact to maintain local and overall power system security.

Question 2

Do you consider the NEM 2025 Reform Program is a major change to AEMO's function, responsibility, obligation and power under the NER?

3.1.3 A major change (including an anticipated change) to any of the computer software or systems that AEMO uses in the performance of any of its functions, responsibilities, obligations or powers under the Rules

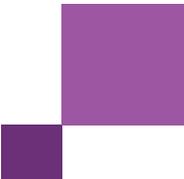
Changes to both business and IT systems are a critical enabler in the NEM 2025 Reform Program. AEMO has undertaken a preliminary impact assessment on its IT systems and business processes to understand where changes may be required in order to implement the reform initiatives effectively. This heatmap assessment⁷ concluded that a large number of AEMO business processes and systems will be impacted to implement the functional changes as a result of the various reform initiatives and also highlighted the critical touch points for AEMO and participant systems and aids in the consideration of alternative groupings and pathways. Specifically, the heatmap assessment identified:

- Functional relationships across NEM 2025 reform initiatives, that is those system, process, policy, trial and deadline relationships
- Significance of the functional impacts from the NEM 2025 reform initiatives
- Significance of the functional impacts from AEMO's own strategic and foundational initiatives

Business processes and systems that will be impacted include:

- AEMO operational tools and interfaces including the PD/ST PASA system and models, MT PASA system and models including the Participant Markets Portal, Demand forecasting systems/processes, other control room displays and tools, including the development or update of at least 220 Application Programming Interfaces (APIs)

⁷ See Appendix A1 for more detail

- 
- AEMO and Participant ancillary services systems and models (such as FCAS, MASS and Causer Pays systems)
 - Bidding interfaces and reports including NEMDE, EMMS, Metering and Settlement Systems (including billing and prudential systems)
 - AEMO Registrations process

Details of the specific IT system and business process changes resulting from the NEM 2025 Reform Program will be identified as the NEM2025 Implementation Roadmap is developed and finalised with stakeholders, and also as initiatives progress through the various stages of their own design or development, for example through the AEMC's rule change request process. Current information on the changes required can be found in presentations published on AEMO's Reform Delivery Committee website⁸.

Initial cost estimates for the NEM 2025 Reform Program are in the order of \$250 million-\$330 million implementation costs (excluding the capacity mechanism, congestion management mechanism, and operating expenditure costs) with an additional \$9 million-\$18 million for the Data Strategy initiatives. These estimates are currently being reviewed in light of additional information on the scope of the initiatives together with the development of the NEM2025 Implementation Roadmap.

Question 3

Do you consider the NEM 2025 Reform Program is a major change to the computer software or systems that AEMO uses in the performance of AEMO's functions, responsibilities, obligations and powers under the NER?

Submissions on these matters per must be made in accordance with the Notice of First Stage of Consultation published with this paper via email to kevin.ly@aemo.com.au by 5.00 pm (AEST) on 15 June 2022.

⁸ [AEMO | Reform Delivery Committee](#)

A1. AEMO's Functional Relationship Heatmap Assessment

A1.1 NEM 2025 Reform Initiatives

	MT PASA	FFR	IES	UCS+SSM	Mandatory PFR	Operating Reserves	FTA (M2)	Scheduled Lite	DOE	DLNS	Turn-up Services	Platform & Registry	Market & System
MT PASA													
FFR			SP, D	SP		SP							
IES		SP, D		SP		SP	SP, D	SP					
UCS+SSM		SP	SP			SP, P		SP, P					
Mandatory PFR													
Operating Reserves		SP	SP	SP, P				SP					
FTA (M2)													
Scheduled Lite			SP	SP, P		SP			SP, T	SP, T	SP, T	SP	SP, P
DOE							SP, P	SP, T		SP, T	SP	SP, P	SP, P
DLNS								SP, T	SP, T		SP	SP	SP, P
Turn-up Services								SP, T	SP, T	SP, T		SP	SP, P
Platform & Registry								SP	SP, P	SP	SP		SP, P
M&S integration								SP, P	SP, P	SP, P	SP, P	SP, P	

Key: SP = System or Process, D = Deadline, T = Trails, P = Policy

Heatmap:

SP
SP, P
SP, T
SP, D
Same initiative

	MT PASA	FFR	IES	UCS+SSM	Mandatory PFR	Operating Reserves	FTA (M2)	Scheduled Lite	DOE	DLNS	Turn-up Services	Platform & Registry	Market & System
Registration		Low impact	Low impact		Low impact	Low impact					Low impact	High impact	
Offers		Low impact				Low impact		Low impact					
Dispatch		Low impact	Low impact	Low impact		Low impact		Low impact					
Constraints		Low impact											
PASA	Low impact												
Settlements, Billing, Rounding		Low impact	Low impact	Low impact	Low impact	Low impact		Low impact			Low impact		
Causer Pays					Low impact								
Control Room Tools		Low impact	Low impact	High impact		Low impact		Low impact					Low impact
CATS							High impact						
αMDM			High impact										
DER			Low impact						Low impact	Low impact			

Key: No impact Low impact Medium impact High impact Significant impact

A1.2 Foundational and Strategic Initiatives

	Portal Consolidation	CoMeSIR	Identity & Access Management	Industry Data Exchange	Enterprise Authentication Authorisation	Business Rules Engine	Forecasting Platform Uplift	Operational Decision Making Tools	Operational Data Store	SCADA Life	ST PASA Replacement	Dispatch Target State	Bids/Offers Target State	Constraints Target State	FRC					
Registration	Low impact	Low impact	Digital Enabling Capability	Digital Enabling Capability	Digital Enabling Capability	Digital Enabling Capability	Digital Enabling Capability	Low impact		Digital Enabling Capability										
Offers	Low impact							Low impact												
Dispatch	Low impact							High impact	Medium impact											
Constraints	Low impact																		High impact	
PASA	Low impact																			
Settlements Billing, Rodeotals	Low impact																			
Causer Pays	Low impact																			
Control Room Tools	Low impact												High impact							
CATS	Low impact	Medium impact																		
eMDM	Low impact																			
DER	Low impact	Low impact					Low impact	Low impact												

Key: No impact Low impact Medium impact High impact Significant impact

A2. Glossary

Term or acronym	Meaning
NEM 2025 Reform Program	The program developed and run by AEMO to implement initiatives required to deliver the ESB's policy reforms
AEMO	Australian Energy Market Operator
ESB	Energy Security Board
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
NEM	National Electricity Market
NER	National Electricity Rules
DER	Distributed Energy Resource
MT PASA	Medium Term Projected Assessment of System Adequacy
ST PASA	Short Term Projected Assessment of System Adequacy
PD PASA	Pre-dispatch Projected Assessment of System Adequacy
FCAS	Frequency Control Ancillary Service
MASS	Market Ancillary Service Specification
NEMDE	National Electricity Market Dispatch Engine
EMMS	Electricity Market Management System