AUSTRALIAN ENERGY MARKET COMMISSION

RULE

Update paper

National Electricity Amendment (Integrating price-responsive resources into the NEM) Rule 2024

National Energy Retail Amendment (Integrating price-responsive resources into the NEM) Rule 2024

Proponent
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About the AEMC

The AEMC reports to the energy ministers. We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the energy ministers.

Acknowledgement of Country

The AEMC acknowledges and shows respect for the traditional custodians of the many different lands across Australia on which we all live and work. We pay respect to all Elders past and present and the continuing connection of Aboriginal and Torres Strait Islander peoples to Country. The AEMC office is located on the land traditionally owned by the Gadigal people of the Eora nation.

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Executive Summary

1 The Australian Energy Market Commission initiated the rule change request *Integrating Price-Responsive Resources into the NEM* through the publication of a consultation paper in August 2023. We received 34 submissions in response to our consultation paper.

2 This paper provides an overview of new work that we have undertaken and the next steps to progress the rule change request. Our proposed next step is to form technical working groups. These groups will provide input on the key design features — the incentives needed to encourage participation, the design to provide visibility and design details for dispatch mode. These are explained in the four chapters of this paper.

3 **Rationale for the rule change** — Stakeholders generally agreed that an increasing amount of invisible and unscheduled price-responsive resources in the NEM would result in inefficiencies and challenges for the operation of the system. However, some stakeholders wanted more definition of where and when the problem arises. We agree that this would be beneficial and have engaged IES to model the 'size of the prize' benefits of integrating these resources. This modelling is underway and we expect to release it in early 2024.

4 **Visibility mode** — Many stakeholders raised material issues with visibility mode as proposed in the rule change request. Stakeholders considered that there is significant diversity in the firmness of price-responsive resources and that visibility mode as proposed would not incorporate many of the less firm resources, or would be costly. There were also concerns raised regarding the benefits of visibility mode because the information provided by participants is not proposed to be directly incorporated into dispatch demand forecasts. AEMO proposed that this information would provide them with 'situational awareness' to aid its decisions on when to use other measures to ensure grid security and reliability.

5 We consider the coverage and issues raised by stakeholders are worthy of further exploration. We engaged Creative Energy Consulting to provide a high-level design of an approach to provide visibility of the responsiveness in a way that addresses the concerns raised. While this design is an alternative to AEMO's proposal, we consider it a development and note that certain features in this design (for example the use of frequency performance payments as an incentive) could also be applied to the AEMO design. The report is attached. We see a lot of merit in how it incorporates information into dispatch, reduces participation costs and provides an (at least a starting) incentive mechanism to encourage take-up. In the first half of 2024, we want to investigate this option.

6 **Dispatch mode** — For resources that are capable of being dispatched there was material support to integrate these resources into central dispatch. Stakeholders considered that getting the incentives to participate right, or requiring participation, would be crucial. Stakeholders also sought extra information regarding the details of dispatch mode in a number of areas. These areas will be the focus of the technical working group for this mode.

7 **Broader reforms** — We note that stakeholders also raised a number of other issues and interactions with other reforms. We will continue to investigate these as the rule change progresses.

8 The technical working groups will be held between February to April 2024. Stakeholders who wish to be considered to be part of the groups can nominate by 19 January 2024. Invitations will be sent in January.

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1 Integrating price-responsive resources is important for the energy system and all consumers

In our consultation paper, we described how integrating price-responsive resources into the market would have a number of benefits. Specifically, we identified five categories of benefit:

- dispatch costs in the NEM — knowing when these resources will be used to reduce demand (particularly at higher cost times) improves demand forecasting and reduces the cost of resources that AEMO dispatches to meet demand
- energy prices in the NEM — by better matching supply and demand, the price of energy would be more efficient, likely reducing price volatility
- cost of security of supply in the NEM — by reducing the need for additional, potentially more expensive generation reserves to balance the market, system security will be achieved at lower cost
- reliability of supply in the NEM — the ability to schedule these available resources could improve planning and the use of lower-cost lower-emission generation and lower intervention costs
- operation of distribution and transmission networks — longer-term accurate forecasts would improve network investments and planning, reducing network costs to consumers.

This chapter outlines how we plan to progress quantifying the benefit that integrating these resources will have going forward.

1.1 Feedback from submissions was generally supportive of integrating these resources

Generally, stakeholders agreed that it is beneficial to integrate price-responsive resources better, as not doing so would create challenges, inefficiencies and cost.[1]

However, some stakeholders expressed caution in terms of how significant the problem is at the moment, indicating that the concerns raised by AEMO were not clearly defined and could be overstated.[2] The AEMC recognises the challenge with the forward-looking nature of this rule change request. However, given the credible estimations of future growth in price-responsive resources, the benefits from better integrating them and the implementation times for market reforms, we will not wait until inefficiencies and problems arise to commence consideration of the rule change request.

To assist the AEMC and stakeholders, we engaged IES to quantify the potential benefits of full integration of unscheduled price-responsive resources.

1.2 We are modelling the benefits of integrating these resources better

We asked IES **what is the size of the potential benefit (or 'size of the prize') of better integrating unscheduled price-responsive resources into the NEM from 2025 to 2050?**

The IES modelling will simulate the anticipated benefits over time from integrating forecast increases in price-responsive resources into market processes. Two different scenarios are being modelled. The first is a future where the actions of price-responsive resources are not captured by

1 Submissions to the consultation paper Powerlink, p. 1 , Stanwell, p. 1, Shell Energy, p.1 Mondo, p. 3, Grids, SwitcheDin, p. 3, Red Energy and Lumo Energy, p. 2, Energy Queensland, p. 2, Energy Locals, p. 1, Rheem and CET, p. 3, and sonnen, p. 3.

2 Submissions to the consultation paper, Simply Energy, p. 1, Enel X, p. 2 and CS Energy, p. 2.

forecasting or incorporated into dispatch. The second is where the responses of these resources are able to be forecast, reducing errors and inefficiencies, with some resources being dispatchable to assist in the management of the system. By comparing these two scenarios we can understand the benefit that integrating these resources can have to the energy system, and the change in emissions.

We expect the modelling to complete soon and will release it in early 2024.

1.3 We will complete a cost-benefit assessment in 2024

The next phase will aim to quantify the costs of different solutions. We will then bring the benefits modelling together with the solutions costing to determine which solution (or combination of solutions) delivers the highest benefits net of participant and system costs. This will help determine the approach that best contributes to the achievement of the national energy objectives. Stakeholders will be able to provide feedback on the draft outcomes of this phase in submissions on the draft determination, which we plan to publish in mid-2024.

2 Visibility mode — incorporating price-responsiveness into forecasting and planning

AEMO proposed a 'visibility mode' to provide it with information on the use of unscheduled price-responsive resources.[3] Participants would provide a forecast of generation and consumption called "indicative bids" and potentially receive a payment to participate. AEMO considers that this would improve scheduling processes, leading to less conservative operation of the system. For example, less security and reliability services (such as using reliability and emergency reserve trader (RERT) and frequency control ancillary services (FCAS)) may be needed as AEMO would be aware of any potential responses.[4] However, the indicative bids themselves would not be used to set prices or dispatch quantities.

This chapter provides an overview of how we plan to progress consideration of visibility mode.

2.1 Feedback from submissions raised concerns about this mode

Most stakeholders agreed that there would likely be benefits in improving the visibility of price-responsive changes. However, stakeholders questioned the benefits of implementing the specific visibility model proposed by AEMO. Stakeholders were concerned about the complexity of the mode which could be costly for participants and noted that it is unclear how the information would improve forecasts.[5]

2.1.1 Some resources are firm while some are not

Stakeholders were divided on their views of AEMO's proposal based on the types of resources that they currently, or expect to, have as being price-responsive. Some raised concerns about their ability to participate in the proposed solutions.[6] Stakeholders raised two main reasons for this:

1. there is still a large degree of uncertainty of how much energy a retailer (or aggregator) can ensure responds and how long it will take to respond (this could be due to the price-responsiveness is due to consumers choosing whether to participate each time) which would make it difficult to accurately comply with indicative bids (or dispatch instructions if progressed to dispatch mode), and
2. how and when the resources are optimised and coordinated to respond does not necessarily align with the time frames to submit information to AEMO (e.g. the resources are optimised as consumers use them and it is not possible to submit accurately in pre-dispatch time frames).

The AEMC recognises the diversity and breadth of resources and responsiveness that currently exist and are likely to eventuate. It is important that the solution aims to improve the efficiency of forecasting and dispatch and therefore is designed to incorporate the responses that are driving the forecast errors. We are giving greater consideration to the design of the visibility solution to incorporate a range of resources.

There was particularly strong support from stakeholders for recognising the potential for aggregated price-responsive resources (and particularly Virtual Power Plants) to provide valuable services in the market. These stakeholders considered that these resources should be treated

3 AEMO, Scheduled Lite rule change request, p. 14
4 See AEMO submission to the consultation paper for further description of how they intend to use this information.
5 Submissions to the consultation paper; Enel X, p. 2, AEC, p. 2, CEC, p. 1, Flow Power, p.3.
6 Submissions to the consultation paper; Evergen, p.4, Origin, p. 2, AEC, p.3, and AGL, p. 2.

similarly, and should be able to provide and earn, the same services and revenue as large-scale energy sources.[7] See chapter 3 for further discussion on this.

2.1.2 Other potential mechanisms to gain information about price-responsiveness

Stakeholders indicated that there may be a more efficient way to provide information on invisible and unscheduled price-responsive resources. Some areas identified included:

- the role of the incoming frequency performance payments (FPP)[8] as an incentive mechanism[9]
- improvements to the current standing data collection portals (such as the Demand Side Information Portal and the DER asset register)[10]
- using dynamic connection and operating envelop information from networks[11]
- amendments to the Wholesale Demand Response Mechanism (WDRM).[12]

2.2 We are considering changes to the design of visibility mode

We consider there is merit to stakeholder concerns about visibility mode regarding:

1. the ability of non-firm resources to participate
2. the costs of participation, and
3. the extent to which the information is incorporated into market systems, and therefore the level of benefits.

We are considering two additional ideas, alongside the potential to improve AEMO's proposed design, to identify an approach that best contributes to achieving the national energy objectives.

2.2.1 An alternative approach to incorporate responsiveness into dispatch processes

We engaged Creative Energy Consulting to identify how we could better integrate price-responsive resources into dispatch processes in a way that addresses stakeholder concerns. Appendix B provides the high-level design of this proposed approach. The two key features of the design are:

1. A new feature is introduced into the wholesale market where retailers[13] are able to provide details of the level of responsiveness of their customers through 'quasi-bids'. These bids are incorporated into dispatch and pricing in a similar way to how scheduled loads bids are incorporated. 'Quasi-bids' would not however result in dispatch instructions or carry conformance obligations.
2. The choice to submit 'quasi bids' would be purely up to retailers. FPP (to be introduced in 2025) would provide incentives for participants to submit accurate 'quasi-bids' as their 'quasi-bid' reduces forecast error, and therefore the requirement for FCAS. Retailers, non-scheduled generators and large customer loads that respond in accordance with their 'quasi-bid' would be rewarded with lower frequency performance costs.

We note that this design is still early in its consideration, needs to be tested with stakeholders and have detailed design and implementation issues explored. However, we see a lot of merit in how it incorporates information into dispatch, reduces participation costs and provides an (at least a

7 Submissions to the consultation paper; Tesla, p. 2, and Reposit, p.1.
8 AEMC, Primary frequency response incentive arrangements rule change, 2019
9 Submission to the consultation paper; CEC, p. 2
10 Submission to the consultation paper; Origin, p. 5, Energy Australia, p. 3, Flow Power, p. 5.
11 Submission to the consultation paper; Energy Queensland, p. 7
12 Submission to the consultation paper; Enel X p. 7
13 Retailers here are taken to mean market participants who are not scheduled. This also includes Integrated resource providers.

starting) incentive mechanism to encourage take-up. This design is likely to better achieve the first three benefits (reduce dispatch costs, increase the efficiency of energy price setting and reduce the cost to ensure system security) that we are seeking to achieve with this rule change. We consider it a development and note that certain features in this design (for example the use of FPP as an incentive) could also be applied to the AEMO design. We also note that this design aligns with the design of the visibility mode that was part of the ESB recommendations to Ministers.[14] We are keen to test the different features with stakeholders through technical working groups. This will assist us in understanding where there may be merits and potential issues.

2.2.2 Improving current standing data information collection

We propose to also consider if current standing data such as the Distributed Energy Resources (DER) asset register and the Demand Side Participation (DSP) information portal can be improved to provide AEMO with the information that it needs on price-responsive resources.

This would suit the varying types of resources and responses that exist and potentially provide improvements at a lower cost than visibility mode as it uses existing systems and processes. However, as it is static it would likely become inaccurate and difficult to incorporate into dispatch.

There could be elements of this information data collection that form part of the overall solution.

2.3 We will develop visibility solutions through working groups in 2024

We propose to further consider the design of the visibility mode with the support of a technical working group (TWG). We have provided an overview of the pros and cons of the different visibility options in the table below.

Table 2.1: Comparison of the three visibility options

Option	Pros	Cons
AEMO visibility option	Serves as a stepping stone for participants to learn and move to dispatch mode Allows AEMO to collect historical data sets which can be used to provide situational awareness for operational decisions	Does not directly affect dispatch and therefore price and system security benefits are uncertain Does not cater for the range of price-responsive resources and demand response behaviours that is occurring The incentive to participate still needs to be designed Could be costly as it requires metering and communications
Alternative approach	Suits a wide range of price-responsive resources and demand response behaviours Response information is fed into the NEM Dispatch Engine (NEMDE) to improve dispatch	Requires AEMO to split its demand forecast by retailers which would be a new process. Requires changes to the FPP framework. Both of these changes will result in system costs for AEMO to implement.

14 ESB, Post 2025 Market Design Final Advice to Energy Ministers Part B, 27 July 2021.

Option	Pros	Cons
	May be less costly as it builds on current processes and metering FPP provides an incentive to participate	Does not serve as a stepping-stone for participants to move to dispatch mode as resources are not participating in central process. This would need to be further considered with dispatch mode if an additional learning period is needed. Additional incentives to FPP may be required to facilitate material uptake
Improving standing data	Suits a range of price-responsive resources and demand response behaviours that is occurring Is a system that retailers and AEMO are currently using and could be easy to amend	Does not feed into pre-dispatch and improve dispatch efficiency Static information is likely to become inaccurate over time Does not serve as a stepping-stone for participants to move to dispatch mode and this would need to be further considered with dispatch mode

Source: AEMC

The TWG will assist us test the different visibility options and determine the most appropriate visibility mechanism to test in detail through a draft rule.

We expect to convene the TWG in late January 2024 and to operate during February to April. Regular meetings during this period would likely be required.

3 Dispatch mode — incorporating price-responsive resources into central dispatch

AEMO proposed a 'dispatch mode' as part of its overall solution.[15] Dispatch mode is designed to integrate unscheduled price-responsive resources (particularly aggregated batteries and vehicle to grid) into the NEM central dispatch and scheduling processes. AEMO noted that having sufficient levels of resources that can be dispatched — comprising controllability, firmness and flexibility — are essential requirements for the operation of the power system.

This chapter outlines:

- Stakeholder responses to the consultation paper
- The Commission's proposed next steps

3.1 Stakeholders supported integrating a subset of price responsive-resources into dispatch

Some stakeholders agreed that introducing dispatch mode will be important in the future. It would enhance the transparency of price-responsive resources, improve the operation of the power system and be a key element of creating compelling customer value propositions.[16] Reposit also considered that there would be no reason for capacity from price-responsive resources to be treated any differently to any other resource.[17]

As noted in the visibility chapter, stakeholders raised concerns around the suitability of some price-responsive resources participating in dispatch, which we agree may be an issue and aim to address through considerations of the visibility mode.

Stakeholders considered that a key element of participation in dispatch mode is getting the incentives to participate right. Many stakeholders considered that market revenues will not be sufficient to drive participation because the benefits of participating would be realised by the market as a whole and not the participant itself. Stakeholders made a number of suggestions for how incentives to participate could be enhanced including engaging with Commonwealth and state governments to consider links to different policy incentives that can work in tandem with market revenues.[18]

Stakeholders noted that there are a number of specific operational details that need to be worked through in order to deliver a successful mechanism. These include:

- the costs of participating in dispatch mode may be a significant barrier, such as the costs required to set up appropriate remote communication, accuracy and data requirements;
- the minimum registration and bidding increments should be reduced, and the registration and portfolio update process should be updated;
- the need to consider how compliance with dispatch instructions and distribution limits (dynamic operating envelopes) can be achieved, particularly if they are communicated separately; and

15 AEMO, Scheduled Lite in the NEM rule change request, p. 14
16 Submissions to the consultation paper, Tesla, p. 2. Energy Locals, pp. 1-3.
17 Resposit, Consultation paper submission, p. 1.
18 Submissions to the consultation paper, Tesla, p. 11. Shell, p. 4. Evergen, pp. 8-9.

- the proposed compliance arrangements may act as a potential barrier to participation with changes needed to strike a balance between encouraging participation and accurate participation.

The Commission considers that there is merit in further considering the dispatch model and will do so through 2024, aiming to publish a draft rule in mid-2024.

3.2 We will further develop the dispatch mode through technical working groups in early 2024

The Commission recognises that integrating price-responsive resources into dispatch processes represents a significant opportunity for the operation of the NEM and will progress with the design of dispatch mode centred around the model proposed by AEMO. We propose to further develop the details of dispatch mode, and solutions to the issues raised by stakeholders, with the support of a technical working group (TWG). The TWG will be comprised of diverse stakeholder representatives and will assist us in testing ideas and potential solutions to deliver our draft determination.

In particular, we are keen to use the TWG to better investigate:

- incentive mechanisms to drive participation in dispatch mode;
- the appropriate framework for dispatch mode (the benefits of the detailed design elements of dispatch mode being included in the rules or procedures);
- costs of participating in dispatch mode, driven by different technical requirements;
- what appropriate compliance arrangements look like; and
- if and how to provide a learning period (stepping stone) for participants to grow their capabilities.

We expect to convene the TWG in late January 2024 and to operate during February to April. Regular meetings during this period would likely be required.

4 This rule change is part of a broader reform to move to a two-sided market

Stakeholders raised issues regarding the interaction of this rule change with other reforms and trials. We are not going to cover them all in this short update paper, but wanted to flag a few key projects that have significant interactions.

4.1 Distributors, operating envelopes and future roles and responsibilities

Distributors play a key role in facilitating the provision of services from distribution connected resources. Unlike at the transmission level, distribution constraints are not (generally) mapped into NEMDE. Furthermore, there is currently no consistent approach across distributors to managing constraints or price signals to price-responsive resources at the distribution level. There are a few work streams that are considering this, including the AER *Flexible Exports Limits Guidelines*.[19] We will closely monitor reforms in relation to distribution system operation during this rule change process and where possible will seek to align the design of dispatch and visibility mode with these reforms.

Distributors also raised that information on price-responsive resources would be important for them to operate their network.[20] Noting that the real-time data on the operation of price-responsive resources that would be collected by AEMO under this rule change could potentially be integrated with distribution network operations to drive additional operational benefits. A key overlap is if dispatch instructions and distribution limits are separately communicated, it could lead to non-compliance with either or both, and would be a poor outcome. We will closely monitor reforms in this area and where possible will seek to align the design of dispatch and visibility mode with any such reforms.

4.2 Unlocking CER benefits through flexible trading

Our *Unlocking CER benefits through flexible trading* rule change will facilitate consumers receiving better offers from retailers for the value that their CER provides.[21] For large customers this rule change may enable customers to have the choice of more than one energy service provider through the separation of resources. For retailers of residential small customers, it may enable separation of passive loads and flexible CER.

Separation of assets through *Unlocking CER benefits* could facilitate greater levels of participation in dispatch mode, however, it is not a necessary prerequisite. We note that for large customers, who will be able to have multiple providers, these other providers who are aggregating resources on customers' behalf, will be able to participate in the reforms from this rule change. For residential customers, this will mean that retailers, being the only FRMP allowed at a connection point, could participate in the reforms from this rule change.[22] We will continue to assess the relationships between the rule changes and whether there are any design considerations for the *Integrating Price-responsive Resources* rule change based on decisions in the *Unlocking CER benefits* rule change.

19 AER, Review of regulatory framework for flexible export limit implementation, July 2023.

20 Submission to the consultation paper SA Power Network, pp. 1-2 and Energy Queensland, p. 5

21 AEMC, Unlocking CER benefits through flexible trading project page.

22 Secondary providers, or non-FRMPs, that a residential customer is using could participate through contract arrangements that they have with the FRMP

4.3 Trials

Stakeholders also raised that the Commission should consider the findings from related work programs such as project EDGE (Energy Demand and Generation Exchange) and Edith[23] before making a decision in this rule change process. Project EDGE recently published its final project report and associated cost-benefit assessment (CBA). Project EDGE demonstrated an end-to-end market arrangement for coordinating DER to provide both wholesale and local network services within the constraints of the distribution network.[24]

The Commission will continue to monitor these programs to see if learnings from them can be applied to this rule change process, particularly the costs and barriers to participation and the ability of different resources to comply with dispatch instructions. We also note that we will endeavour to incorporate as many leanings as we can however some issues covered in these projects may be out of scope for this rule change.

23 Ausgrid, Project Edith.
24 AEMO, Project Edge.

Abbreviations and defined terms

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CBA	Cost benefit assessment
CER	Consumer Energy Resources
Commission	See AEMC
DER	Distributed Energy Resources
DSP	Demand side participation
EDGE	Energy Demand and Generation Exchange trial project, run by AEMO
FCAS	Frequency Control Ancillary Services
FPP	Frequency Performance Payment
FRMP	Financially Responsible Market Participant
NEM	National Electricity Market
NEMDE	NEM Dispatch Engine
Proponent	The individual / organisation who submitted the rule change request to the Commission
RERT	Reliability Emergency Reserve Trader
TWG	Technical Working Group