AEMC

RULE

Australian Energy Market Commission

RULE DETERMINATION

NATIONAL ELECTRICITY AMENDMENT (ENHANCING INFORMATION ON GENERATOR AVAILABILITY IN MT PASA) RULE 2022

PROPONENT

Australian Energy Market Operator

18 AUGUST 2022

INQUIRIES

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AEMC, Enhancing information on generator availability in MT PASA, Rule determination, 18 August 2022

ABOUT THE AEMC

The AEMC reports to the Energy Ministers' Meeting (formerly the Council of Australian Governments Energy Council). We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the Energy Ministers' Meeting.

SUMMARY

1 The Commission has decided to make a more preferable final rule on *Enhancing information on generator availability in MT PASA* in response to the rule change request received from the Australian Energy Market Operator (AEMO) on 15 December 2021. The final rule increases the scope of information about availability that is gathered from generators and published by AEMO, under the existing Medium Term Projected Assessment of System Adequacy (MT PASA).

2 Specifically, the final rule builds on existing MT PASA requirements, which require generators to indicate how many megawatts (MW) they could make available each day over the medium term horizon (this is between seven days and 36 months into the future). In addition to providing the MW availability, the final rule would require scheduled generators to also provide a:

- *unit state* — that is, a scheduled generating unit's availability or unavailability and the reason for its availability or unavailability (referred to throughout this document as unit state, reason or reason code)
- *unit recall time* — to indicate the period in which the plant could be made available under normal conditions after a period of unavailability. AEMO would determine which unit states will require a unit recall time to be submitted.[1]

3 This final rule actions one of the Energy Security Board's (ESB) post-2025 recommendations to improve resource adequacy outcomes in the National Electricity Market (NEM).

4 The final rule is consistent with the main purpose of the PASA, which is to ensure that "...participants are properly informed to enable them to make decisions about supply, demand and outages of transmission networks..."[2] and supports other PASA outcomes such as the publication of "sufficient information to allow the market to operate effectively with a minimal amount of intervention by AEMO."[3]

Better information for the market and policy-makers will lead to more efficient decisions and better outcomes for consumers

5 The lack of detailed information on generator availability is becoming an issue, where it has not been in the past, due to the ongoing transition in the power system. As older generators approach the end of their technical life, their operators may shift to cyclical operating regimes, opting only to generate for certain periods of the year to maximise their profitability. This is due to large amounts of renewable energy generators entering the market and applying downward pressure on prices, especially at particular times of the day and year. As more generators move to cyclical operating regimes the challenge of operating the power system to deliver reliable, secure supply is expected to grow.

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1 Not all units would be required to enter a recall time. The requirement for a recall time will be triggered by a relevant reason code as outlined in the Reliability Standard Implementation Guidelines (RSIG).

2 NER cl. 3.7.1(b). This clause will be labelled the "PASA objective" under this final rule.

3 NER cl.3.7.1(d)

6 In its Post 2025 review of the NEM, the ESB considered the reliability issues associated with less-flexible generators changing their operating schedules for economic reasons and in particular the issue of mothballing generation units. This rule change request arose from this work and was one of several recommendations seeking to enhance reliability, which Energy Ministers agreed to progress.

7 This rule change seeks to improve understanding about why particular generators are unavailable and how long it will take them to come back online. Improving access to more detailed availability information, including understanding whether generators are offline for economic reasons, will contribute to better operational, planning, policy and investment decisions by a broad range of stakeholders as less flexible generators continue to change their operating schedules.

8 Without comprehensive, granular, standardised and public information about reasons and recall times to accompany existing unit availability information and provide a more nuanced view of future unit availability, AEMO, participants and other stakeholders will likely face increasing time and resource costs to cobble together an incomplete picture of how changing plant operating regimes are influencing the supply outlook over the medium term. This would mean less informed decisions and a reduced ability for each stakeholder to play its role in an orderly transition.

9 Systematically collecting and publishing more detailed information on generator availability is particularly important as the generation mix in the NEM becomes more complex. Without a standardised approach to the publication of detailed unit availability information, the market operator would continue to make ad-hoc requests to a growing number of diverse generators for the information it needs to operate the power system and market. This would become increasingly impractical and costly. It would also become increasingly challenging for market participants, policymakers and other stakeholders to remain appropriately informed about generator availability given information collected through AEMO requests is not made public.

10 While we acknowledge there will be some costs associated with providing more detailed information via the MT PASA, we have sought to minimise these through the final rule's design and implementation approach. More broadly, we consider that the costs incurred by generators and AEMO would be offset by the broad benefits that better information provides for all stakeholders.

11 Better information contributes to more efficient decisions. The flow on effect of this is the potential for lower energy prices and increased reliability outcomes for consumers. The information provided for in this final rule will support more efficient market outcomes, more targeted policy decisions, and ultimately a more coordinated approach to deliver a decarbonised, affordable, and reliable energy system for all consumers.

The Commission has considered stakeholder feedback in making its decision

12 The final rule aims to provide a comprehensive, standardised and public data set of unit availability and unavailability while minimising the compliance burden on participants. The

Commission has considered the stakeholder feedback that was received in response to a consultation paper and draft determination and rule when making its final determination. The key elements of the final rule are as follows:

- Scheduled generators must submit **reason codes** and **recall times** to accompany the daily MW availability they already submit in MT PASA
- The process for, and the form of, reason and recall time information would be defined by AEMO in its Reliability standard implementation guideline (RSIG). AEMO will be required to consult with stakeholders as per the consultation procedures in the Rules.
- We acknowledge that the way that reason codes and recall times are defined in the RSIG will have a bearing on the compliance burden. As such, the Commission has:
  - specified in the rule that reason codes must distinguish between two main reasons, i.e whether unavailability is for economic or physical reasons
  - expressed a preference for AEMO to keep the number of reason codes to a minimum
  - provided clarification in the rules that the definition of unit recall time represents the time a participant expects to return the unit to service under "normal conditions after a period of unavailability" i.e, based on market response and not AEMO direction.
- Reason codes and recall times would be collected for the same 36-month timeframe that MW availability information is collected at present in MT PASA for consistency and to be useful in informing medium-term operational and investment decisions.
- Reason codes and recall times will be published alongside the MT PASA reliability assessment, and not be an input to the modelling. AEMO would continue to analyse reliability over a 24 month period using the PASA availability that participants can make available given 24 hours notice.
- AEMO will clarify existing information requirements that stakeholders have identified as potentially overlapping, and where efficient, remove any fields and/or requirements that are deemed to be duplicative.

13 There are three key milestones in relation to the Commission's final rule:

- Updates to the RSIG and MT PASA process description by **30 April 2023**
- Updates to other relevant AEMO guidelines and processes to streamline the collection of generator availability information where practical
- Commencement of the rule on **9 October 2023.** This date will allow AEMO and participants sufficient time to make changes to systems and processes including sequencing and/or bundling changes to systems and processes to reduce costs.

14 The Commission notes that much of the implementation detail falls to AEMO to develop. AEMO agrees that the approach set out by the Commission is a pragmatic way of balancing these costs and benefits and will work with participants when consulting on guidelines and procedures updates to achieve this balance so that the majority of the benefits are captured for the majority of stakeholders while minimising the costs to relevant participants.

CONTENTS

APPENDICES

TABLES

FIGURES

1 FINAL DETERMINATION

This chapter summarises the Commission's final determination. The Commission has decided to make a more preferable final rule requiring scheduled generators to provide, and AEMO to publish, more information about when each generating unit is available over the next three years. This will include a "unit state" with standardised reason codes to explain the status of each unit and a "unit recall time" that indicates the period in which the plant could be made available under normal conditions after a period of unavailability.

This new information, collected and published as part of the existing Medium-Term Projected Assessment of System Adequacy (MT PASA) process, would create a standardised, unit-by-unit, 36-month, public data set to underpin our collective understanding of the medium-term supply outlook.[4]

This chapter gives a brief overview of the final rule and what it would mean in practice, including:

- the rule-making process, including consultation with stakeholders — see section 1.1
- the key details of the final rule — see section 1.2
- how this rule fits into the broader NEM reform landscape — see section 1.3

1.1 The Commission has considered stakeholder feedback on its draft rule

On 15 December 2021, AEMO submitted a rule change request identifying that changes in generator operating regimes, driven by the rapid transition of the NEM's generation fleet to a lower-emissions generation profile, may bring uncertainties and therefore challenges in maintaining system security and reliability.[5]

AEMO proposed that more detailed information be collected and published about scheduled generator availability as part of the MT PASA process to improve the transparency of information and allow for improved operational, market and investment decisions by market participants, jurisdictions, and market bodies.

The request actions the ESB's *managing early exits* recommendation from the post-2025 reform package — a suite of reforms recommended by the ESB to meet the needs of the energy transition underway.[6]

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4 MT PASA is a key part of the reliability framework in the NEM. It is one component of the information that AEMO must publish to inform the market of prevailing and forecast conditions, and when reserves may be running low, to elicit a market response. Providing information to the market helps market participants make operational and investment decisions and also helps AEMO manage the power system.

5 The rule change request submitted by AEMO on 15 December 2021 can be found here: https://www.aemc.gov.au/rule-changes/enhancing-information-generator-availability-mt-pasa

6 See ESB's recommendation 1(a)(ii) which is to: Instruct the ESB to prepare a rule change for submission to the AEMC to implement enhancements to existing generator exit mechanisms to provide greater transparency of generator availability. In agreeing to the recommendation National Cabinet noted that the rule change request should be prepared in consultation with senior officials and that AEMO should notify jurisdictions if a change in generator availability results in a breach of that jurisdiction's adopted reliability standard. https://www.energy.gov.au/sites/default/files/2021-10/Summary%20of%20the%20final%20reform%20package%20and%20corresponding%20Energy%20Security%20Board%20recommendations0.pdf

The rule-making process and stakeholder input have progressed as follows:

- **3 February 2022** — the Commission published a notice advising of its commencement of the rule-making process and a consultation paper seeking stakeholder feedback on the proposal.[7]
- **3 March 2022** — Submissions to the consultation paper closed. Eight submissions were received.
- **26 May 2022** — A draft determination was published, outlining the Commission's draft rule incorporating stakeholder feedback on the consultation paper.
- **7 July 2022** — Submissions to the draft determination closed. Seven submissions were received.[8]

The Commission has considered all issues raised by stakeholders at each stage of the consultation process. Responses to matters raised in submissions to the draft determination are discussed either in the body of this final rule determination or in appendix A**.**

1.2 The Commission has made a final rule to collect and publish more information about generator availability as part of MT PASA

The Commission has made a more preferable final rule that is identical in substance to the draft rule. It requires scheduled generators to report, and AEMO to publish, a generating unit's:

- *unit state* — in the form of standardised reason codes that explain why a scheduled generating unit is or is not available
- *unit recall time* — to indicate the period in which the plant could be made available under normal conditions after a period of unavailability. AEMO will determine which unit states will require a unit recall time to be submitted.[9]

This information will form part of the MT PASA.[10] Through the MT PASA process, AEMO already collects and publishes information from scheduled generators about their daily availability from seven days to 36 months ahead of real-time.[11] The reason codes and recall times collected under this final rule will cover the same period as part of the generator's regular submission of MT PASA data. This information will be published alongside existing PASA availability information in AEMO's MT PASA DUID Availability Report to help inform the decisions of participants, market bodies, policy makers and other interested stakeholders.[12]

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7 This notice was published under s. 95 of the National Electricity Law (NEL)

8 Submissions to the consultation paper and draft determination available on the project page — https://www.aemc.gov.au/rule-changes/enhancing-information-generator-availability-mt-pasa

9 Not all unit states will require the submission of a recall time. The requirement for a recall time will be triggered by specific reason codes, as outlined in the RSIG.

10 You can find more information about the MT PASA in appendix F.1

11 Under NER cl. 3.7.2(d)(1)(i), scheduled Generators are already required to submit to AEMO a daily PASA availability for a 36-month period. This represents the generation capacity that could be made available within 24 hours taking into account ambient weather conditions at the time of 10%POE demand.

12 DUID stands for dispatchable unit identifier. AEMO's MT PASA REGIONAVAILABILITY Report is a high frequency three-hourly information service (the 'three-hourly report') that gives a regional breakdown of the supply situation over a 36-month horizon, taking into account participant submissions on availability.

The information collected will *supplement* rather than be an input to the MT PASA modelling outputs, that is the Reliability run and the Loss of Load Probability (LOLP) run.[13] MT PASA modelling outputs will remain at 24 months given AEMO's current expectation of cost to extend it to three years (in line with the information provided by scheduled generators) is likely to outweigh the expected benefits some generators have described, at this time.

The form and approach for collecting and publishing both reason codes and recall times will be developed by AEMO and reflected in updates to the RSIG and the MT PASA process description.[14] AEMO will be required to consult with stakeholders through the *Rules consultation procedures* when updating the RSIG to reflect this final rule.[15] Stakeholder input will be particularly valuable in developing the standard list of reason codes to explain unit state, and to help determine which reason codes will also require the entry of a unit recall time. For example, where a unit has a reason code that indicates it is fully available, providing a recall time may not be relevant. AEMO will work with stakeholders to develop a form and approach to collecting reason codes and recall times that focus on the purpose of that information, which is to inform more efficient operational and planning decisions.[16]

Scheduled generators already have processes in place to ensure the PASA availability information represents the participant's "current intentions and best estimates" of the megawatts that they could make available for a given period.[17] Given the new reason and recall information is linked to the PASA availability information already provided, it must also meet this standard, and the Commission recommends that the new requirement be classified as a tier 1 civil penalty provision, consistent with the current penalty.[18] [19] The AEMC consulted with the AER with respect to the proposed classification for the civil penalty provision to be recommended for the final rule. The AER is supportive of the AEMC's recommendations.

The Commission acknowledges stakeholder feedback noting that information relating to generator availability is collected by AEMO or provided by participants under some existing

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13 The Reliability run is the annual operational "sent-out" demand profiles, consisting of half-hourly demand values, with energy consumption and maximum demand aligned with AEMO's latest sent-out forecasts. This identifies and quantifies any projected breach of the reliability standard. The Loss of Load Probability (LOLP) run is the abstract operational demand and VRE generation forecasts constructed, based on the evaluation of the years of historical observations. The traces represent conditions of high demand levels occurring coincidentally with low VRE generation output and are abstract since these conditions are assumed every day. This helps determine days most at risk of load shedding to help participants schedule outages outside of these periods, and indicate when AEMO may be required to direct or contract for reserves under the RERT. More information can be found in the MT PASA process description: https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/pasa/mt-pasa-process-description-v62.pdf?la=en

14 The Reliability standard implementation guidelines (RSIG) set out how AEMO implements the reliability standard and the approach and assumptions AEMO uses in relation to each of the inputs. The MT PASA process description fulfils AEMO's obligation under clause 3.7.2(h) of the Rules to document the procedure used in administering the MT PASA

15 The Rules consultation procedure requirements are set out in NER Chapter 8. The requirement for AEMO to use the *Rules consultation procedures* to update the RSIG with regard to this final rule is set out in NER cl 11.[151].2(b) of the amending rule.

16 AEMO must have regard to the NEO which broadly means the benefit of providing the information must outweigh the cost. It must also now have regard to NER cl.3.7.1(b) now labelled the "PASA objective" when defining reason codes and recall times in the RSIG. The PASA objective focuses on information that is required so the market is properly informed to enable it to make decisions about supply, demand and outages up to three years in advance.

17 NER clause 3.7.2 (d)

18 Under a tier 1 civil penalty, failure to submit the required information, or providing inaccurate information, would carry a maximum penalty for corporations of $10 million, or if greater, three times the benefit obtained from the breach if this can be determined, or if not, 10% of annual turnover of the corporation. Tier 1 civil penalties are outlined in Regulation 6(2) and Schedule 1, Part 1 of the *National Electricity (South Australia) Regulations.*

19 In addition to the MT PASA compliance and enforcement framework, generators are expected to continue to maintain procedures and records consistent with the NER or "good electricity industry practice" so their generating units comply with relevant generator performance standards, regardless of their availability.

rules requirements.[20] We have analysed this and are of the view that, in many cases, the information currently collected is of a different nature and for a different purpose than the information required by this final rule. However, where opportunities exist to streamline information collection, AEMO will update guidelines to reflect this. For example, the new information collected through this final rule may replace the need to collect the same information through the ESOO process, although similar information may still be required for differing time horizons.

In addition, the Commission expects the regular collection of standardised, granular reason and recall information from all scheduled generating units through MT PASA could decrease the volume of ad-hoc requests AEMO makes to participants, reducing the administrative burden associated with the final rule.

The RSIG — which will set this information out — is to be updated by **30 April 2023** ahead of the commencement of substantive provisions of the final rule on **9 October 2023**.

1.3 The final rule is part of a plan to support a smooth transition to a lower emissions electricity system that is reliable and affordable

The electricity sector is decarbonising. This is demonstrated through changes in consumer and industry behaviour and investments both in the energy sector and more broadly, as well as through policy commitments.

Decarbonisation is relevant to the final rule given the transition of the NEM's generation fleet to a lower-emissions generation profile is driving changes in the sector. One such change is to plant operating regimes, for example the mothballing of units for prolonged periods of time, seasonal shut-downs, or cyclical running regimes.

This trend is particularly relevant to thermal generation because challenges in maintaining system security and reliability can arise if changes in operating regimes are not transparent and managed.

The actions of ageing thermal generators have been in the spotlight since the closure of Northern and Hazelwood power station in 2016 and 2017 and then again with the announcements of Origin and AGL to bring forward the closure dates to Eraring, Bayswater and Loy Yang.[21] More recently, tight supply conditions that lead to AEMO suspending the market in June 2022 again highlighted the speed at which conditions can change in the market and power system, and the importance of information transparency, especially in relation to generator availability.

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20 NER cl. 4.8.5 requires generators to submit outage recall information at AEMO's request if it is required in order to estimate the latest time that it would need to intervene. NER cl. 4.9.9 requires scheduled generators to notify AEMO of any events that change or are likely to change the operational availability of a generating unit. Participants also provide availability information under the generator information guidelines to inform the preparation of the Energy Statement of Opportunities (ESOO) and under the Energy Adequacy Assessment Projections (EAAP) guidelines to provide a broad assessment of impacts on supply and reliability in the NEM.

21 Eraring, a black coal power station owned by Origin will now close in 2025 - seven years earlier than planned. AGL owns both Bayswater and Loy Yang and has brought forward their closure dates to no later than 2033 (Bayswater, a 2640MW black coal power station in NSW previously closing in 2032) and 2045 (Loy Yang, a 3280MW brown coal power station in Victoria previous closing in 2048).

The public dialogue around generator availability now and in the future has also been influenced by a number of regulatory actions — key market and regulatory events are summarised in appendix D**.**

While the impacts of key events on power system security and reliability have varied from minimal to material, unexpected changes in unit availability continue to be a concern. This rule won't make generators available, but it will provide market participants with more information to schedule any planned unavailability in an optimal way. It will also provide a much broader range of stakeholders with information to inform their activities, whether that be investment, policy design, compliance activities, or just a deeper understanding of the future reliability outlook. In this context, the final rule intends to contribute toward reliability and efficiency through the provision of better information to the market and to policymakers.

The final rule is part of a broader work program across the market bodies and the ESB that seeks to meet the needs of the transitioning power system now and into the future. Other projects directly related to this final rule include:

- the AEMC and AEMO's **work to update the ST PASA process and methodology** including the AEMC's final rule to provide AEMO with the flexibility to update ST PASA so that it remains fit for purpose as the market develops, and AEMO's ST PASA Replacement Project that involves a comprehensive review of the Pre-dispatch (PD) and Short Term (ST) PASA methodology, exploring the development of a system that will serve the NEM now, and into the future.[22][23] ST PASA and MT PASA are important parts of the reliability framework, working together to provide participants and other stakeholders with the information they need to identify and manage risks to power system security and reliability from one day to three years ahead. The granularity of information collected under the ST PASA and MT PASA processes changes to reflect the time period covered by each tool. Improving the granularity and transparency of information collected over the medium-term (seven days to three years) will assist participants in transitioning their planning activities from the medium to short term. The Commission notes that the changes made under this final rule are consistent with the final *Updating Short Term PASA* rule so that the two processes continue to work together.[24]
- the **ESB's resource adequacy work program** includes a number of reforms that seek to maintain alignment between both the physical needs of the electricity system and the financial interests of generating resources.[25] This final rule is consistent with the

22 AEMC, *Updating Short Term PASA* final rule, 5 May 2022. More information can be found here: https://www.aemc.gov.au/rule-changes/updating-short-term-pasa

23 Information about AEMO's ST PASA replacement project can be found here: https://aemo.com.au/en/initiatives/trials-and-initiatives/st-pasa-replacement-project

24 The *Updating Short Term PASA* final rule commences on 31 July 2025, while the *Enhancing information on generator availability in MT PASA* final rule is set to commence on 9 October 2023. There are two areas of cross over: 1) The "PASA objective" specified in the MT PASA final rule to guide AEMO in developing reason codes and an approach to recall time information will also guide AEMO as it administers ST PASA when the *Updating Short Term PASA* rule commences in 2025. The "PASA availability" definition will remain the same in this MT PASA final rule but change when the *Updating Short Term PASA* rule commenced in 2025 to allow AEMO to define a "given recall period" in the RSIG. This will allow the recall period to be different for ST PASA and MT PASA. AEMO will consult with stakeholders to define the appropriate recall period when it updates the RSIG to provide for the *Updating Short Term PASA* final rule. More information in section 3.4.3.

25 ESB Post-2025 Market design final advice to Energy Ministers, Part B, 27 July 2021, p.15-46. https://www.datocms-assets.com/32572/1629945809-post-2025-market-design-final-advice-to-energy-ministers-part-b.pdf

managing early exits recommendation made by the ESB as part of its resource adequacy package and will support the objective of aligning physical and financial needs by providing a public source of granular information to inform decisions around generator availability. [26]The ESB's resource adequacy work also includes consideration of a capacity mechanism to explicitly value capacity to provide an 'investable' and enduring long-term signal for the right mix of capacity as the generation mix transitions, and tools that provide jurisdictions sufficient confidence that reliability will be maintained. Improving information transparency on availability would complement other resource adequacy workstreams. More information on how this rule will support a capacity mechanism is provided in section 3.1.4

- the AEMC's **Essential system services** work includes a range of projects that all seek to put in place mechanisms to procure, value and schedule the essential system services needed to support the changing mix of resources in the NEM. The AEMC's work in this space progresses the ESB's recommendations around essential system services, with current work focusing on operating reserves, primary frequency response, and an operational security mechanism; following recent new rules to put in place a new fast frequency response service and to evolve the system strength arrangements. The more nuanced understanding of the medium-term supply outlook made possible with the reason and recall information collected and published under this final rule will assist AEMO and participants in undertaking planning activities to have better information about what particular units may be doing. For example, AEMO has noted that its longer-term planning activities, including system strength and inertia projections, can require considering the likelihood of and nature of changes in plant operational behaviour in response to changing market conditions.

In its role as rule-maker, the Commission takes a practical and transparent approach to decision-making that works to help deliver a decarbonising, affordable, and reliable energy system for all consumers.

This final rule seeks to provide a comprehensive, standardised, more granular and public data set on generator availability allowing stakeholders to form a nuanced view of the supply outlook, and importantly, how it may change as market conditions change.

With better and more transparent information, participants, market bodies, policymakers and other interested stakeholders will be able to make more informed decisions. This will ultimately lead to a more coordinated approach to delivering a decarbonising, affordable, and reliable energy system for all consumers.

26 See recommendation 1(a)(ii) which is to *"instruct the ESB to prepare a rule change for submission to the AEMC to implement enhancements to existing generator exit mechanisms to provide greater transparency of generator availability"*. Made as part of the final reform package agreed by Energy Ministers in response to ESB post 2025 market re-design recommendations at: https://www.energy.gov.au/sites/default/files/2021-10/Summary%20of%20the%20final%20reform%20package%20and%20corresponding%20Energy%20Security%20Board%20recommendations0.pdf

2 THE COMMISSION CONSIDERS THAT THIS FINAL RULE WILL PROMOTE THE LONG TERM INTERESTS OF CONSUMERS

This chapter explains why the Commission has made its final determination and the accompanying more preferable final rule. It outlines the:

- problem identified in the rule change request and how the final rule will address it
- reasons the Commission considers the more preferable final rule will promote the long-term interests of consumers, the benefits, costs and how these will be managed
- how the final rule meets the assessment criteria used to consider the proposed and alternative solutions.

Under the NEL, the Commission may only make a rule if it is satisfied the rule will, or is likely to, contribute to the achievement of the national electricity objective (NEO).[27] This is the decision-making framework that the Commission must apply.

The NEO is:[28]

> to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:
>
> (a) price, quality, safety, reliability and security of supply of electricity; and
>
> (b) the reliability, safety and security of the national electricity system.

The question to be answered in assessing any rule change proposal is, therefore, would the proposed change promote more efficient decisions relating to investment, operation and use of electricity services in a way that would ultimately promote the long-term interests of consumers?

The Commission is satisfied that collecting and publishing reason and recall time information to explain the daily megawatt availability already provided as part of the MT PASA process will, or is likely to, contribute to the achievement of the NEO. The Commission has made a final rule to achieve this. The final rule is published alongside this final rule determination.

Under s. 91A of the NEL, the Commission may make a rule that is different (including materially different) to a proposed rule (a more preferable rule) if it is satisfied that, having regard to the issues raised in the rule change request, the more preferable rule will or is likely to better contribute to the achievement of the NEO. In this instance, the Commission has made a more preferable rule as it will better meet the NEO by minimising the costs of implementation while capturing the benefits of improved information, compared to the solution proposed in the rule change request. The reasons are set outlined below.

27 Section 88 of the NEL.
28 Section 7 of the NEL.

2.1 The final rule addresses the reliability and security problems associated with a lack of consistent, standardised, public information about generator availability over the medium term

The ESB identified an opportunity to reduce a market failure as part of its post-2025 recommendations to Ministers, which is reflected in AEMO's rule change request. The opportunity was to improve the imperfect information on generator availability over the medium-term horizon. Highly competitive markets have free or low-cost access to important information about the market to boost competition and help drive prices down. Lack of information increases the risks and costs for all stakeholders who rely on knowing what generation is available to make their own availability decisions. It can provide (an inefficient) benefit from scale by introducing information asymmetry. Larger generators have access to information about a larger share of the generation fleet and their scale also allows them greater financial scope to obtain any information they lack than their smaller competitors.

In practice, a lack of information around generator availability over the medium term makes it more challenging for:

- **AEMO** to effectively plan and operate the system
- **participants** to coordinate their maintenance schedules
- **the AER** to assess compliance, such as under the current notice of closure arrangements
- **investors** to assess opportunities for replacement plant or demand response capability
- **policymakers** to make informed policy decisions and take targeted action.

This can lead market bodies, participants and other market players to make less than efficient decisions, resulting in increased wholesale prices that increase consumer bills.

This lack of detailed information on generator availability is becoming more of an issue, where it has not been in the past, due to the ongoing transition in the power system. As older generating units approach the end of their technical lives, their operators may shift to cyclical operating regimes, opting only to generate for certain periods of the year to maximise their profitability. This is due to large amounts of renewable energy entering the market and applying downward pressure on prices, especially at particular times of the day and year. As more units approach the end of their technical life and move to cyclical operating regimes, the challenge of operating the power system to deliver reliable, secure supply is expected to grow. There is a cost of not addressing it in a timely manner.

Our analysis and consultation with stakeholders have revealed several existing processes through which AEMO collects information from generators on the reasons for and recall times associated with their unavailability over the medium-term forecast horizon. However, these existing processes have a number of limitations, which justify the information provision requirements of this final rule. In particular, information collected under these processes is not:

- *centralised* — it is collected through a number of different processes for different reasons
- *standardised* — it is provided through different communications channels and in different units and formats

- *comprehensive* — it does not cover all time periods and units e.g. ESOO covers high level detail for 10 years, recall portal covers detailed outage recall information but only for the period covered by specific market notices
- *sufficiently granular* — the most complete data set on generator availability published in AEMO's generation information page only includes information to a seasonal resolution
- *public* — much of the existing generator availability information is not published, therefore not accessible by policymakers, market participants and other interested stakeholders.

These features of information provision are important in the context of the generation mix in the NEM becoming more complex and with greater numbers of different types of generators. Without a standardised approach to the publication of generator availability through reasons and recall times, it will become increasingly challenging for the system operator, regulator, market participants and policymakers to remain appropriately informed about generator availability. It will also be impractical for the market operator to make ad-hoc requests to a growing number of diverse generators for information it needs to operate the power system.

2.2 Reasons for making the final rule

After providing due consideration to the issues raised in the rule change request, during consultation, and in response to the draft determination, the Commission is satisfied that collecting and publishing more information on generator availability as part of the MT PASA process will, or is likely to, contribute to the achievement of the NEO. This section outlines the benefits, the costs, and how the Commission has decided to implement the more preferable final rule.

2.2.1 Better inputs lead to better outputs

In the case of this final rule, the Commission considers that a **regular**, **comprehensive, granular, standardised, and public** data set that includes reasons and recall time to explain unit availability in more detail will lead to more informed and efficient decisions and, ultimately, reliability at a lower cost to consumers, compared with the status quo.

Specifically, differentiating between generators that are offline for economic reasons or physical reasons will indicate how possible or likely it is that a unit's availability may change and under what conditions. Where AEMO has determined that a unit state would trigger the submission of unit recall time, this information will indicate how quickly a unit's availability could change. Both pieces of information add to stakeholder understanding of what the supply outlook may look like under different future scenarios.

While some information on future generator availability can be found or inferred from other sources of market information, establishing MT PASA as the central and public source of information about future generator activity over the medium term will provide a valuable resource for a broad range of stakeholders to inform their operational, investment and policy decisions. This information would support:

- more efficient planning and operational decisions by **participants** (e.g. adjusting maintenance schedules, informing AEMO intervention activities)
- more informed problem identification and policy action from **market bodies and other policymakers** (e.g. targeted problem identification and regulatory actions)
- more granular analysis to inform a variety of decisions by other interested stakeholders.

This information may also help participants and investors make more informed risk/opportunity assessments and therefore entry/exit decisions (e.g. timing of investment in new plant or demand response capability). The Commission acknowledges that the lead time of many decisions of this type exceeds the forecast horizon of MT PASA,[29] but considers the information will still contribute to key elements of investment decisions including the exact timing of entry.

2.2.2 The cost can be minimised through the implementation process

The Commission acknowledges there are upfront and ongoing costs for AEMO and generators associated with meeting this new requirement. AEMO has indicated that the cost of implementing changes to market systems and processes will be approximately $1-2million.[30] This largely consists of upfront costs to change systems and processes and to consult on and update relevant guidelines and procedures.

Scheduled generators will also face upfront and ongoing costs to implement and comply with the new requirement. Stakeholders noted this in their submissions but did not provide any detail on the costs themselves.

The Commission is mindful of the implementation and compliance costs that will be faced by AEMO and scheduled generators. Consequently, it has sought to balance the costs and benefits of the final rule by:

- stating a preference for AEMO to implement the minimum number of reason codes as is practical to realise the benefits and the need for a reason code to distinguish between a physical and economic reason, while minimising cost and complexity for scheduled generators (see section 3.1.1 for detail)
- allowing AEMO to determine which reason codes must be accompanied by a recall time (see section 3.1.2 for detail)
- stating a preference for AEMO to allow flexibility for participants when estimating recall times such that small changes to future outage plans do not always result in changes to the MT PASA entry (see section 3.1.2 for detail)
- working with AEMO to identify opportunities to streamline existing rules requirements relating to information about generator availability so that, where practical, these new MT PASA inputs will supercede existing ones (see section 3.4.2 for detail)

29 As noted by Stanwell in its submission to the draft determination on p. 2

30 AEMO's estimate was provided as part of the ESB's post-2025 package of reforms, p.61 and AEMO confirmed this during the development of this final determination.

- requiring AEMO to have regard to the PASA objective when developing the details and approach for collecting and publishing reasons and recall times.[31] As well as having regard to the NEO to balance benefit against cost, the PASA objective will help limit the scope of information collected under this new requirement to that required to achieve the objective. That is, what information is required so that the market is properly informed to enable them to make decisions about supply, demand and outages up to three years in advance.
- requiring AEMO to consult with stakeholders when updating guidelines and procedures to reflect this new requirement (see section 3.4.2 for detail)
- allowing participants sufficient time to make changes to systems and processes by setting a draft commencement date of 9 October 2023. This date should allow participants to sequence and/or bundle changes to systems and processes to reduce costs (see section 3.4.1 for detail).

Much of the implementation detail falls to AEMO to develop. AEMO agrees with the approach set out by the Commission and will work with participants when consulting on guidelines and procedures updates to achieve this balance, so that the majority of the benefits are captured for the majority of stakeholders while minimising the costs to relevant participants (see Section 3.4 for more detail on the implementation process and timeframes).

The Commission has delegated much of the implementation detail to AEMO to provide flexibility into the future. This will allow the detail to evolve with the NEM and its generation mix, for example, if the introduction of new generation technologies necessitates new reason codes. Most stakeholders were supportive of this approach, with Origin and Shell noting their general support.[32] AGL also supported this approach, and considered that the guidance provided in the draft determination provides necessary certainty to stakeholders.[33] Stanwell, on the other hand, considered that too much uncertainty is created by delegating substantial detailed design to AEMO.[34] The Commission is confident that AEMO will have regard to the NEO and will take sufficient guidance from the rules and this determination. It also considers that stakeholders will be provided enough notice of, and input to, initial implementation detail (and any future changes) given the rules consultation procedures set out the specific process and timelines that AEMO must follow when updating the RSIG.

2.2.3 There is a cost of doing nothing

In considering the cost associated with *making* the final rule, the Commission notes there would also be a cost associated with *not making* a rule. The rapid transition of the NEM's generation fleet to a lower-emissions generation profile is already driving changes to plant operating regimes such as mothballing of units for prolonged periods of time, seasonal shut-downs, or cyclical running regimes.

31 NER cl. 3.7.1(b) has been formally labelled the "PASA objective" under this final rule.
32 Submissions to the draft determination: Origin Energy, p. 1; Shell Energy, p. 2
33 Submission to the draft determination: AGL, p. 1
34 Submission to the draft determination: Stanwell, p. 4

AEMO anticipates generators will continue to make operational changes in their lead up to retirement. With this comes an increasing challenge for AEMO to assess the security and reliability implications of those operational changes.

AEMO anticipates an increased volume of ad-hoc requests for further information at higher cost due to receiving this information in a non-standardised way through mixed communication channels (e.g. email, phone call). This also continues to create a lost opportunity because ad-hoc information cannot be used for broader analysis — e.g. as part of AEMO's operational readiness planning, determining the requirement for RERT, for longer-term planning activities including system strength and inertia projections, and other measures that support operating a reliable and secure power system.

Market participants and other stakeholders also require detailed information about the future supply outlook to make good operational, investment and policy decisions and play their role in delivering reliable supply. Currently, participants rely on a range of sources to form an incomplete view of that future and have raised the need for more information.

Without granular, standardised and public information to provide a more nuanced view of future unit availability, AEMO, participants and other stakeholders would likely face an increasing time and resource cost to cobble together an incomplete picture of how changing plant operating regimes are influencing the supply outlook over the medium term. This would mean less informed decisions and a reduced ability for each stakeholder to play its role in an orderly transition.

The counterfactual to having market-wide access to detailed information on generator availability was demonstrated in the wholesale market events of Autumn and Winter 2022 where concurrent coal-fired unit outages combined with other external factors to lead to an unprecedented period of extremely high prices, ultimately resulting in the suspension of the market.[35] Two stakeholders acknowledged that the Commission's draft rule may have helped alleviate the situation, concurring that this rule is now more relevant in the context of recent events.[36]

2.2.4 The benefits of the more preferable final rule outweigh its costs

Improving the information available about the market to all stakeholders will allow them to make more efficient decisions, resulting in decreased costs across the market. Requiring scheduled generators to submit and AEMO to collect and publish recall times and reason codes in MT PASA will come with an up-front implementation cost and an ongoing operational and compliance cost.

The Commission considers that the benefits to *all* stakeholders of publishing unit states explaining reasons and recall times to indicate how quickly a unit could be back in service is likely to outweigh the costs to generators and AEMO of providing it. The information is important for supporting more efficient market outcomes, more targeted policy decisions,

35 See AEMO market notice 97705 for more details on the market suspension — https://aemo.com.au/en/market-notices/97705

36 Submissions to the draft determination: CS Energy, pp. 1-2; Shell Energy, p. 2

and ultimately a more coordinated approach to delivering a decarbonising, affordable, and reliable energy system for all consumers.

Most stakeholders acknowledged in their responses to the consultation paper that providing additional information to the market was a good thing. However, some generators questioned whether the problem is material and the benefits sufficient to warrant the cost of making a change. In response to these concerns, the draft rule was designed to minimise burden on generators while providing the necessary information to stakeholders. This included the Commission noting its preference that AEMO minimise the number of reason codes, and that AEMO should review its information collection processes and where efficient, remove duplicative requirements. Generators were broadly supportive of these measures in their submission to the draft determination, however, some sought more prescriptive requirements in terms of implementation and streamlining to provide them with additional certainty.[37] This is covered in more detail in chapter 3.

The Commission made a number of design choices to make a final rule that is more preferable than the rule change proposed by AEMO.[38]The more preferable final rule includes the following features that were not included in the rule change request:

- It makes a specific distinction between a physical and economic reason for an unavailable unit state. This distinction, which was not proposed in the rule change request, is a key component of the more preferable final rule as it will allow stakeholders to form expectations around whether unit availability may change and under what conditions.
- It will require AEMO to determine which unit states must also be accompanied by a unit recall time in consultation with stakeholders and with regard to the PASA objective. The form and approach for collecting recall times will be defined by AEMO in the RSIG. This approach, which is different to that proposed in the rule change request, means that stakeholder views can be taken into account so that the approach determined in the RSIG pragmatically accommodates situations where the value of marginal improvements to accuracy when it comes to estimating recall times are not offset by the costs of calculating it.

The requirements in this final rule will apply to scheduled generators from the commencement date of 9 October 2023. However, they will also apply to scheduled bidirectional units on commencement of the *Integrating energy storage systems into the NEM* rule in June 2024.[39][40]

These elements allow for the final rule to better meet the NEO because they minimise the costs associated with providing this more detailed information about generator availability to the market.

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37 Submissions to the draft determination: Engie, p. 2; Origin Energy, p. 1; Shell Energy, p.1; Snowy Hydro, p. 1; Stanwell, p. 3

38 AEMO rule change request, submitted on 15 December 2021, can be found here: https://www.aemc.gov.au/rule-changes/enhancing-information-generator-availability-mt-pasa

39 Section 3.4.4 explains how the final rule aligns with the *Integrating energy storage systems into the NEM* final rule

40 On 2 December 2021, the Commission made a final rule in response to a rule change request from AEMO to better integrate storage and hybrid systems, and allow greater participation in the market. More information on the final rule can be found here: https://www.aemc.gov.au/rule-changes/integrating-energy-storage-systems-nem

2.3 Considering the more preferable final rule against the assessment criteria

In assessing this rule change request, the Commission has focused on **market efficiency criteria,** on the basis that improving the inputs, for example, the quality of information, can improve the outputs, for example, reliability, security and affordability.

The Commission considers the following criteria relevant for understanding how the final rule promotes the NEO:

- **Improving information transparency:** The final rule will improve the quality and transparency, and therefore reduce the cost, of important market information. Including the unit state as well as the reason for unavailability (whether physical or economic) and recall times, along with existing PASA availability information, should level the playing field and provide value to a broader range of stakeholders that struggle to access and/or interpret current information in an efficient and useful way.
- The information collected under this final rule will be:
  - directly **relevant** to the investment and operational decisions of participants, market bodies, policymakers and a range of other interested stakeholders
  - a **comprehensive data set**, covering all scheduled generating for every 24 hour period over 36 months[41]
  - **granular** over the medium-term, allowing participants to form a more accurate assessment of the availability intentions of their competitors[42]
  - **standardised**, making it easier to interpret on a like for like basis and use in scenario planning[43]
  - **public** so it can be accessed by all interested stakeholders including policymakers, market bodies, market participants and other interested stakeholders.[44]
- **Increasing competition:** the final rule will promote competition by informing activity between wholesale market buyers and sellers, levelling the playing field, reducing transaction costs, and reducing barriers to efficient entry and exit of participants. This may include opportunities for newer participants such as aggregated distributed energy resources or those with demand response capability.
- **Increasing productive efficiency:** the final rule will promote productive efficiency by more accurately informing the market of generation availability so that participants can make better-informed decisions regarding scheduling planned maintenance and establishing expected reliability and security conditions. This should lead to the optimal (least-cost) combination of resources available to meet demand at a price that closely

41 AEMO may request any data it needs to operate the power system or market but this is done in an ad-hoc, as needs manner and cannot be used, even within AEMO for any kind of formalised planning or assessment

42 Information published on AEMO's generation information page covers a 10-year period but only includes information at a seasonal resolution. ST PASA and the generator recall portal captures granular information only over operational timeframes. EAAP/GELF provides a detailed understanding of resource constraints but does not provide insight into commercial motivations.

43 A standard list of reason codes and a standard approach to recall times will be defined in the RSIG.

44 AEMO collects a range of information to perform its functions that is not made public e.g. through its *Procedure for Submitting Recall Information of Scheduled Generator Outages*

reflects the cost of providing that resource. Where participants fail to deliver secure and reliable supply, this information will assist AEMO and governments to intervene in the market in more targeted and efficient ways.

- **Supporting reliability and security outcomes:** the final rule promotes lower-cost security and reliability. Higher quality and more transparent information about generator availability supports productively efficient operational and medium-term planning decisions (as described above). It will also improve the ability of AEMO to assess reliability and security conditions in the NEM and provide more accurate information to the market, further promoting reliability and security outcomes over time.

The Commission is mindful that the way a change is implemented may be the difference between a solution that contributes to the achievement of the NEO and one that does not. The Commission had three implementation criteria in mind when assessing the final rule. **Costs and complexity, impact across and within stakeholder groups,** and **consistency with related reforms**. In deciding to make this final rule the Commission considers that:

- the **costs** to AEMO and scheduled generators in making changes to implement the new requirement are offset by the benefits to a broad range of stakeholders. The Commission also considers that the final rule can be implemented in a way that minimises **cost and complexity** (see Section 2.2.4 above)
- there are a variety of **stakeholder impacts** with AEMO bearing the majority of implementation costs and other stakeholders receiving the benefits of the new information. The Commission considers this to be appropriate in order to serve the long-term interests of consumers. This is consistent with how the current MT PASA requirement for generator availability information applies and this new information is just an extension of that idea.
- in terms of **consistency with related reforms**, MT PASA is a core part of the reliability framework in the NEM. The information collected through this final rule will support efficient operation of the market and may also be useful in informing the design or operation of a number of other work programs, including the ESB's resource adequacy reform package, the AEMC's essential system services work, and the AEMC's and AEMO's work to update short-term PASA (see Section 3.4.3 and Section 3.1.4).

3 DETAILS OF THE RULE CHANGE AND ITS IMPLEMENTATION

This chapter provides more detail on key elements of the final rule. It explains the Commission's decisions and responds to stakeholder issues. The chapter is divided into the following sections:

- Collecting unit state (reason codes) and unit recall times from scheduled generators — this section explains what the new requirements are, what they are not, and how they will be implemented.
- How reason codes and recall times may work in practice — this section provides an illustrative example of what the new requirement may look like in practice and explains how this new information can better inform stakeholder understanding and decision-making.
- Compliance, enforcement and penalties — this section explains the legal framework that will apply for the purposes of the final rule
- Timeline and process to implement the final rule — this section provides key details and dates in the process to implement the final rule, and outlines how the final rule interacts with other sections of the Rules.

3.1 Collecting *unit state* (reason codes) and *unit recall times* from scheduled generators

The Commission's final rule requires scheduled generators to submit a *unit state* in the form of standardised **reason codes** that explains why a scheduled generating unit is or is not available. AEMO will define a standard list of reason codes in the RSIG in a way that is easy for market participants and other stakeholders to differentiate whether the unit is unavailable for:

- *economic reasons* — for example, where the participant has put the unit into reserve such that the time to recall would exceed 24 hours resulting from an expectation that wholesale prices would not be sufficient to justify keeping the unit operating or on standby.
- *physical reasons* — for example, where the participant has planned maintenance from which the unit is expected to take more than 24 hours to return to operation upon recall.

In addition, the final rule requires scheduled generators to submit a **unit recall time** to accompany certain reason codes. The unit recall time will:

- represent the period in which the plant could be made available under normal conditions after a period of unavailability, and not under direction from AEMO.[45]
- not be required for all reason codes —AEMO will define which reason codes must be accompanied by a recall time in the RSIG.

45 This is consistent with the purpose of PASA which is to collect and publish information that can help participants make informed decisions and to allow the market to operate effectively with a minimum amount of intervention by AEMO.

Both pieces of information will be provided by scheduled generators alongside the existing requirement for PASA availability in accordance with the MT PASA schedule and when their current intentions and best estimates change.[46]

The final rule requires AEMO to have regard to the PASA objective when developing the details and approach for collecting and publishing reasons and recall times.[47] As well as having regard to the NEO to balance benefit against cost, the PASA objective will help limit the scope of information collected under this new requirement to that required to achieve the objective. That is, what information is required so that the market is properly informed to enable them to make decisions about supply, demand and outages up to three years in advance.

Stakeholders expressed mixed views on the Commission's draft determination to collect reason codes and recall times from generators in MT PASA.

Some stakeholders disagreed with the draft determinations assessment that the benefits of the new information to all stakeholders outweighed the cost to generators and AEMO to implement the rule, arguing the cost to generators would exceed the industry-wide benefits.[48] Others noted that they consider that recall times will be of little to no value over a 36-month forecast horizon as the level of uncertainty is too high.[49]

However, most stakeholders broadly agreed with the draft determination and noted the following benefits:

- **AGL** said, in reference to the draft determination *"we broadly support improvements to generator transparency, particularly when this information can facilitate efficient market outcomes"*[50]
- **CS Energy** said they support *"the need to develop flexible and adaptive market and regulatory frameworks to ensure market participants and AEMO have the information they require"*[51]
- **Origin Energy** said *"The draft rule could address any potential concerns over the status and recallability of plant"*[52]
- **Shell Energy** said in the context of the recent market suspension *"additional information in the form of reason codes and recall times could have supported other market participants to respond accordingly to the tight supply-demand balance"*[53]

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46 PASA availability is defined as "the physical plant capability (taking ambient weather conditions into account in the manner described in the procedure prepared under clause 3.7.2(g)) of a scheduled generating unit, scheduled load or scheduled network service available in a particular period, including any physical plant capability that can be made available during that period, on 24 hours' notice". Clause 3.7.2(a) of the NER states that "The medium term PASA covers the 24-month period (or, in the case of paragraphs (d)(1)(i) and (f)(5) the 36-month period), commencing from the Sunday after the day of publication with a daily resolution. Every week, AEMO must review and publish the outputs of the medium term PASA in accordance with the timetable.

47 NER cl. 3.7.1(b) has been formally labelled the "PASA objective" under this final rule.

48 Submissions to the draft determination: Engie, p. 2; Stanwell, p. 2

49 Snowy Hydro, submission to the draft determination, p. 1

50 AGL, submission to the draft determination, p. 1

51 CS Energy, submission to the draft determination, p. 1

52 Origin Energy, submission to the draft determination, p. 1

53 Shell Energy, submission to the draft determination, p. 2

These stakeholders did not differentiate between reason codes and recall times when noting their support or lack thereof — they were either supportive of the collection of both, or neither piece of information.

3.1.1 Implementation detail for reason codes

The Commission considers the final rule requirement for reason codes, which does not differ to the draft rule, can be implemented with minimal administrative burden on participants. The *reason* for unit unavailability is already known to participants, and thus the additional ongoing burden involves logging and submitting this information alongside their usual availability bids. Requiring AEMO to publish this additional information will add minimal cost to AEMO and allow participants and stakeholders to make better, more efficient decisions that should result in lower and less volatile wholesale prices and thus lower prices for consumers.

The Commission has a preference for AEMO to develop the minimum number of individual recall codes that are practical. There is a trade-off between the value stakeholders get from increasing the granularity of reason codes compared to the burden this places on generators. More codes increases the burden in both administration and compliance with diminishing returns for stakeholders when using these distinctions to inform operational and investment decisions. The Commission's view is that there is a small number of useful codes, beyond which would not materially enhance the information provided to the market.

Both Shell Energy and CS Energy supported this approach.[54]In the event that a generator fulfils the criteria for multiple reason codes, the Commission expects that they would submit the *dominant* or *main* reason for the unavailability for each trading day, noting that the dominant reason for unavailability may change throughout the course of the outage. The Commission expects that AEMO will provide guidance on this situation in the RSIG or MT PASA process description and encourages stakeholders to engage in the consultation process to help inform the outcomes.

Stakeholders noted that similar information on reasons for unavailability is collected through the generation information survey process as part of AEMO's preparation of the ESOO. The Commission notes, however, that the information collected through the generator information survey is materially different in that AEMO expects participants only to submit unavailability if the period of unavailability is long enough to materially impact overall seasonal availability. Additionally, AEMO has indicated that the information collected under this final rule could replace some of the information occasionally provided through the generation information survey where efficient. This is detailed further in Section 3.4.2.

3.1.2 Implementation detail for recall times

The Commission's more preferable final rule maintains the same approach to unit recall times as the draft rule. That is, scheduled generators will only be required to submit a unit recall time to accompany applicable reason codes as defined by AEMO in the RSIG.

54 Submissions to the draft determination: CS Energy, p. 2; Shell Energy, p. 2

AEMO will have the flexibility to determine which reason codes require the entry of a unit recall time. For example, where a unit has a reason code that indicates it is fully available, providing a recall time will not be relevant. Or for certain types of outages (or at certain stages during major outages), it may be unreasonably costly or of little value to estimate a recall time.

Some stakeholders expressed views on what situations should not require the submission of recall times:

- **Shell Energy** proposed that maintenance of any kind should not require a recall time.[55]
- **CS Energy** proposed that only outages with non-zero PASA availability should require a recall time.[56]

It is the Commission's view that there might be value in providing a recall time in both of these cases, at an acceptable cost to the generator. Stakeholders will have the opportunity to provide input on the circumstances under which reason codes require a recall time when AEMO consults on the required updates to the RSIG. Notwithstanding this, it is the Commission's preference that AEMO allow flexibility for participants when estimating recall times such that small changes to future outage plans do not always result in changes to the MT PASA entry.

As specified in the final rule, the unit recall time will represent the period in which the plant could be made available under normal conditions after a period of unavailability, and not under direction from AEMO. This is consistent with the purpose of PASA, which is to collect and publish information that can help participants make informed decisions and to allow the market to operate effectively with minimum amount of intervention by AEMO.[57]

3.1.3 Reason code and recall time obligations will not extend beyond scheduled generators as the benefit does not outweigh the cost for other scheduling categories

In line with other, existing MT PASA obligations, the new obligations that this final rule introduces will only apply to scheduled generators (and scheduled bidirectional units with the commencement of the Commission's *Integrating energy storage systems into the NEM* rule — see section 3.4.4 for detail). Some stakeholders suggested that the obligations should also apply to semi-scheduled and non-scheduled generators, arguing that the market is trending toward a higher proportion of semi and non-scheduled generators.[58]

While the Commission acknowledges that there may be value in this suggestion in future when the proportion of semi-scheduled generators is higher, we consider that at this time the whole of market cost would exceed the benefit. This is because only six percent of registered generation capacity is non-scheduled, and semi-scheduled generators are already required to

55 Shell Energy, submission to the draft determination, p. 3.

56 CS Energy, submission to the draft determination, p. 2.

57 Clause 3.7.1(b) of the NER, which will become the "PASA OBJECTIVE" under this final rule. It states "The PASA is a comprehensive program of information collection, analysis, and disclosure of medium term and short term power system security and reliability of supply prospects so that Registered Participants are properly informed to enable them to make decisions about supply, demand and outages of transmission networks in respect of periods up to 2 years in advance (or up to 3 years in advance, where specified). NER cl. 3.7.1(d) adds to this by saying "AEMO must use its reasonable endeavours to ensure that it publishes sufficient information to allow the market to operate effectively with a minimal amount of intervention by AEMO.

58 Submissions to the draft determination: Engie, p. 2; Snowy Hydro, p. 1

provide information on their availability through the intermittent generation availability process.[59] Additionally, we consider that the combination of variable renewable energy generation's zero short run marginal cost, and short start-up time mean they would only be unavailable in the MT PASA timeframe for physical reasons.[60]

3.1.4 The MT PASA reliability assessment will continue to cover a 24-month period

One of the principal functions of MT PASA is for AEMO to assess the power system's projected performance against the reliability standard.[61] To perform this task, AEMO uses the information provided by participants along with AEMO forecasts and constraint information to compare available generation in the system with forecast demand, and assess the probability of lost load.[62]

This final rule will not change the way AEMO undertakes its reliability assessment in MT PASA. That is, AEMO will undertake the MT PASA reliability assessment for a two-year forecast horizon based on the capacity that generators can make available given 24 hours of notice, as is the case presently.

A number of stakeholder submissions to the draft determination made the case for extending the reliability assessment to 36 months.[63]

CS Energy encouraged the Commission to reconsider its position not to extend saying *"Industry relies on the reliability assessment to make operational decisions which may influence availability. Extending the reliability assessment would provide generators with a greater level of information which in turn would enhance the information provided to AEMO via the MT PASA and strengthen investment signals"*[64]

Engie noted that *"If there is value in the additional information being collected over a three-year time horizon, then there is equally likely to be value in AEMO's reliability assessment horizon being extended to three years."*[65]

Shell Energy re-emphasised its view from previous submissions that it is *"disappointed that the AEMC again has opted not to make a rule change in this regard [extending the reliability assessment from 24-36 months] based on what in effect is quite a small cost [to AEMO]… around $800,000 upfront… relatively small when considered as part of the overall implementation costs across industry."*[66]

The Commission notes that there are mixed views across industry as to the benefit of extending the reliability assessment.

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59 For more information on this process, see AEMO's G*uide to intermittent generation* — https://www.aemo.com.au/-/media/files/market-it-systems/guide-to-intermittent-generation.pdf

60 The semi-scheduled generator category is comprised solely of variable renewable energy generators

61 Clause 3.7.2(f)(6)(ii) of the NER

62 further detail provided in MT PASA process description available here: https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/pasa/mt-pasa-process-description-v62.pdf?la=en

63 Shell Energy and EUAA also supported an extension of the reliability assessment in their submissions to the consultation paper.

64 CS Energy, submission to the draft determination, p. 2.

65 Engie, submission to the draft determination, p. 2.

66 Shell Energy, submission to the draft determination, p. 2.

Some participants suggest the benefits of a longer reliability assessment include:

- better ability to plan outages[67]
- promoting investment through financial contracting three years out[68]
- supporting wholesale demand response in the NEM[69]
- complementing the Retailer Reliability Obligation[70]
- better aligning with three-year notice of closure[71]

Other participants note that availability information provided 24-36 months ahead of real-time carries a high degree of uncertainty, and is of little value,[72] a point that supports AEMO's view that the reliability assessment for this period would be a low-quality forecast.[73]

The Commission acknowledges that some participants may benefit from the additional information provided by including an additional year in the MT PASA reliability assessment. However, the Commission continues to support AEMO's view that the cost to AEMO would outweigh the mixed assessment of benefit expressed by participants at this time.[74]

The costs, which are ultimately borne by market participants and passed through to customers, include both direct cost, and the lost opportunity cost arising from dedicating additional resources to the MT PASA process that could otherwise be used for higher priority projects.

The Commission notes that participants are served well by ESOO forecasts of reliability for periods more than 24 months ahead. The ESOO provides information that can help stakeholders plan their operations over a 10-year outlook period. The ESOO is published annually and updated more regularly if significant new information of relevance becomes available. Unlike the MT PASA, it also incorporates future committed network and generation upgrades, investments and withdrawals which can be useful in informing the decisions of stakeholders over the medium and longer term.[75]

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67 Shell Energy, submission to the draft determination, p. 2.

68 Shell Energy, submission to the draft determination, p. 2.

69 Shell Energy, submission to the draft determination, p. 2.

70 The Commission notes that AEMO's ESOO, and not the MT PASA reliability assessment, supports the operation of the RRO. Under the RRO, the AER may trigger the RRO if AEMO identifies, through its ESOO forecast, a material reliability gap in the NEM three years and three months out.

71 The current notice of closure rules (Clause 2.10.1(c2) of the NER) require generators to give AEMO at least 42 months notice of their intention to permanently retire a generating unit unless they are granted an exemption by the AER.

72 Submissions to the draft determination: Origin, p. 1, Snowy Hydro, p. 1.

73 draft determination on *Enhancing information on generator availability in MT PASA,* May 2022, p.32.

74 The draft determination for *Enhancing information on generator availability in MT* PASA noted that AEMO's updated cost estimate to extend the MT PASA reliability assessment from 24-36 months would be broadly similar to the previous estimate of $800,000 up front, noting some escalation. AEMO considers committing resources to this extension would mean taking resources away from other higher priority reforms.

75 Committed future generators represent generation investment that is considered to be proceeding based on AEMO's commitment criteria. For more detail see the AEMO Generation Information page: http://www.aemo.com.au/Electricity/National-Electricity-MarketNEM/Planning-and-forecasting/Generation-information

3.2 How reason codes and recall times may work in practice and inform stakeholder decisions

The following example demonstrates how the final rule could work in practice. However, the Commission notes that AEMO will develop the actual implementation detail, including the reason codes and which should be accompanied by a recall time.

Table 3.1 depicts an example MT PASA submission for a 100 MW combined cycle gas turbine. The submission covers the following events:

- *1-2/01/2024* — Plant expected to be fully available
- *3-5/01/2024* — Planned boiler maintenance, plant expected to be part-available as open cycle gas turbine with two day recall to full availability
- *6-7/01/2024* — Plant expected to be fully available
- *8-9/01/2024* — Planned major plant upgrade, expected to be unavailable, no recall time required due to complex physical works
- *10-12/01/2024* — Market conditions expected to be unfavourable, plant in reserve shutdown with two day recall
- *6-7/01/2024* — Plant expected to be fully available

Table 3.1: Reason codes and recall times example

TRADING DATE	PASA AVAIL-ABILITY (MW)	REASON CODE	RECALL (DAYS)	*INFORMATION*
01/01/2024	100	AVAILABLE_FULL		
02/01/2024	100	AVAILABLE_FULL		
03/01/2024	70	AVAILABLE_PART_PHYS	2	Boiler maintenance
04/01/2024	70	AVAILABLE_PART_PHYS	2	Boiler maintenance
05/01/2024	70	AVAILABLE_PART_PHYS	2	Boiler maintenance
06/01/2024	100	AVAILABLE_FULL		
07/01/2024	100	AVAILABLE_FULL		
08/01/2024	0	UNAVAILABLE_PHYS		Plant Upgrade
09/01/2024	0	UNAVAILABLE_PHYS		Plant Upgrade
10/01/2024	0	UNAVAILABLE_ECON_RES	2	Unfavourable market conditions expected
11/01/2024	0	UNAVAILABLE_ECON_RES	2	Unfavourable market conditions expected
12/01/2024	0	UNAVAILABLE_ECON_RES	2	Unfavourable market conditions expected
13/01/2024	100	AVAILABLE_FULL		

Source: AEMC
Note: The *information* column is for stakeholder information only, it is not expected to form part of the submission

3.2.1 How can reason and recall time information better-inform stakeholder decisions?

With the new information collected and published under the final rule, as well as existing availability information collected as part of the MT PASA process, stakeholders will have access to three key pieces of information about a scheduled generating unit's future availability.

What does daily megawatt availability (existing requirement) tell us?

Daily PASA availability indicates whether a unit could be available or not during that period. Notably, plant availability is distinct from a participant's intention to generate, it represents the availability of plant to generate if market conditions are favourable to do so. This is distinct from ST PASA where availability signals that a participant is willing to generate at or above a certain wholesale price.

What does the reason code (economic or physical) tell us?

Reason codes can indicate how possible it is that a unit's availability may change and under what conditions. For example, a generating unit that is unavailable in a future period for:

- **physical reasons** (e.g. planned maintenance) may be unable or less likely to respond to changes in market conditions — and the likelihood of it changing will decrease as the time of planned maintenance approaches and resources are committed to the maintenance task.
- **economic reasons** (e.g. due to sustained low prices making operation uncommercial) is more likely to respond to changes in market conditions, assuming appropriate resources can be mobilised to bring it back online.

The Commission considers that this distinction between economic and physical unavailability is what provides specific value to stakeholders. This distinction was not proposed in the rule change request but is a key component of the more preferable final rule. It would allow stakeholders to form expectations around whether unit availability may change and under what conditions.

What does recall time (where required for a specified unit state) tell us?

The recall time can indicate how quickly a unit's availability could change if market conditions change. For example:

- a unit with a recall time of 48 hours, could be expected to come online to fill a gap left by a forced outage, or a short-term price increase.
- a unit with a recall time of six months, may only return early from its planned period of unavailability if there was a more permanent change in market conditions, such as the exit of another plant.

Together, these three pieces of information allow stakeholders to form a more nuanced view of what the supply outlook may look like under different future scenarios.

3.3 Compliance, enforcement and penalties

Consistent with the framework that applies to unit availability information provided under MT PASA currently, the reason and recall information submitted under this final rule must represent the participant's current intentions and best estimates. The Commission is recommending the new requirements be classified as a tier 1 civil penalty provision.[76]

Under a tier 1 civil penalty, failure to submit the required information, or providing inaccurate information, carries a maximum penalty for corporations of $10 million, or if greater, three times the benefit obtained from the breach if this can be determined, or if not, 10% of annual turnover of the corporation.[77]

In addition to the MT PASA compliance and enforcement framework, generators are expected to continue to maintain procedures and records consistent with the NER or "good electricity industry practice" so their generating units comply with relevant generator performance standards, regardless of their availability.

Engie considered that categorising the rule as a tier 1 penalty may result in indirect costs for participants as they seek to mitigate their compliance risk.[78] It is the Commission's view that these indirect costs will be small, as scheduled generators are already subject to the same test and penalty when providing daily PASA availabilities under the current process. Under the existing process, if a unit is unavailable, the PASA entry would be zero megawatts. The next non-zero entry would be informed by an internal organisational view of the reason for the outage and the unit capabilities around recall. The final rule extends the level of detail reported to AEMO associated with the current PASA availability entry but is not, at its core, a new concept for the business when considering its legal obligations in relation to the existing PASA framework.

The compliance and enforcement framework, including the penalty, should always reflect the criticality of the obligation it relates to. The Commission considers that, as with the PASA availability information, the new reason and recall information must be accurate so that it can be relied upon to inform operational and planning decisions and will therefore recommend that this new obligation be classified as a tier 1 civil penalty provision. However, the Commission notes that participants need flexibility to adjust decisions and information. Not having flexibility to change information could result in inefficient decisions being made based on out of date information.

The final rule provides flexibility for scheduled generators to update their submission as new information becomes available, with their submission being reflective of their "current intentions and best estimates". This is consistent with the existing clause in MT PASA and with similar ST PASA and ESOO provisions.[79]

76 Clause 3.7.2(d1) of the NER.
77 Section 2AB(1c) of the NEL.
78 Engie, submission to the draft determination, p. 2.
79 See clauses 3.7.2(d), 3.7.3(e) (ST PASA) and 3.13.3A(g)(3) (ESOO) of the NER.

3.3.1 Using reason and recall time information as part of other compliance frameworks

Generally speaking, information collected and published under the rules can be used by the AER as an input to a range of monitoring and compliance activities.[80]

For example, increasing transparency around the reasons why a generator is unavailable and its recall time may provide an extra level of granularity for the AER to use as part of its general market monitoring functions. The AER notes that this information may be used to assess how the market may have been informed regarding the reasons and duration of an outage. Where there is a recall time, it is possible, if such information is used by AEMO for example, to inform RERT activation, that the AER may use this to investigate whether the unit was actually made available within a reasonable allowance by the market participant according to its "best estimate". Ultimately, given the longer term outlook of MT PASA (168 hours from dispatch), the AER considers it unlikely that any of the provided information would have pricing implications.

The ESB noted, and the rule change request suggested, that reason and recall information collected under this final rule could be used by the AER to inform both its assessment of compliance under the current notice of closure arrangements and its general market monitoring functions.[81]

The current notice of closure rules require generators to give AEMO at least 42 months notice of their intention to permanently retire a generating unit unless they are granted an exemption by the AER.[82]AEMO publishes closure dates as a public record of notice of closure and the AER has a record of units that have been given exemption.[83] The AER notes that the introduction of reasons and recall times may have a limited impact on its compliance and enforcement actions under the current notice of closure framework in practice.

Despite the potential limitations in using reason and recall time information collected under the final rule, the Commission considers the new information will still be a valuable input for a broad range of stakeholders when looking to understand in a general sense, how generator behaviour is influencing market outcomes.

3.4 Timeline and process for implementing the final rule

There are three key milestones in relation to the Commission's final rule:

1. Updates to the RSIG and MT PASA process description by **30 April 2023**

80 See for example section 18D(1)(a) of the NEL which provides that the AER must, in performing the AER wholesale market monitoring functions in relation to a wholesale electricity market, use publicly available information to identify any relevant matter referred to in section 18C(1), which deals with one of the AER's wholesale market monitoring functions.

81 Rule change request from AEMO on 15 December 2021: *Enhancing information on generator availability in MT PASA*, page 4. See: https://www.aemc.gov.au/sites/default/files/2021-12/ERC0338%20Rule%20change%20request%20pending.pdf. See also Energy Security Board: *Post 2025 Market Design Final Advice to Energy Ministers Part B* 27 July 2021, page 26. Available here: https://www.datocms-assets.com/32572/1629945809-post-2025-market-design-final-advice-to-energy-ministers-part-b.pdf

82 NER clause 2.10.1(c2).

83 Closure dates for all registered participants can be found on AEMO's generator information page at: https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/generation-information

2. Updates to other relevant AEMO guidelines and processes to streamline the collection of generator availability information where efficient and practical
3. Commencement of the final rule on **9 October 2023**

3.4.1 Timeline for implementation

The implementation timeline dates have been set in consultation with AEMO and stakeholders to allow both participants and AEMO to consolidate changes to systems to minimise the total implementation cost.

Commencement date

9 October 2023 was selected as the final rule implementation date.[84] This is when scheduled market participants must begin submitting the additional information required under this rule through AEMO's MT PASA system. The date aligns with the implementation of the Commission's *Fast frequency response market ancillary service* rule (FFR rule), allowing both to be implemented in a streamlined way.[85] The implementation of the FFR rule necessitates several changes to AEMO's participant market portal, as well as participant bidding systems — which are often also used for MT PASA submission. Consequently, AEMO recommended that the commencement date for this rule be set to align with the FFR rule so that these changes can be bundled together to require a single update to the market portal and participant systems.

Updates to guidelines and procedures

30 April 2023 was selected as the date by which AEMO must update the *RSIG* and *MT PASA process description*.[86] By this time, AEMO *must* have consulted on and updated the RSIG and MT PASA process description to include the new provisions relevant to this rule. AEMO expects to release draft updates by the end of 2022. This allows AEMO four months from the expected publication of the final rule to produce the draft and another four months for AEMO to consult on the drafts and make the final guidelines and procedures. [87]This timetable will allow participants over five months to update their systems and procedures accordingly. Origin, the only stakeholder to provide feedback on this timeline, considers it to be adequate.[88]

3.4.2 Guideline updates

The additional information to be collected from participants under this final rule necessitates updates to several guidelines to give market participants guidance on how the rule will operate in practice. The Rules require AEMO to follow the Rules consultation procedures

84 See the transitional provision in clause 11.151.1 of the amending rule.

85 For more information on this rule, see the rule change project page — https://www.aemc.gov.au/rule-changes/fast-frequency-response-market-ancillary-service

86 See the transitional provision in clause 11.151.3 of the amending rule.

87 The final rule does not explicitly require AEMO to release draft guidelines by this date. AEMO will determine the dates (in keeping with the Rules consultation procedures) that are most practical considering other reform processes underway.

88 Origin Energy, submission to the draft determination, p. 1.

when updating the RSIG, generation information guidelines, and EAAP guidelines, and as such, stakeholders will be consulted on the revisions.[89] The MT PASA process description is not subject to the same rules requirement for consultation. However, AEMO has indicated to the Commission that it will undergo consultation when updating this document as well.

Reliability standard implementation guidelines

AEMO is required to consult on and update the RSIG to include the collection and use of the additional data on recall times and reason codes required by this final rule by 30 April 2023. In developing the updated RSIG, AEMO should consider the principles defined in the *PASA objective.*

The Commission understands that AEMO intends to delegate much of the process detail from the RSIG to the MT PASA process description. We support this approach, but also note that we expect the reason codes and high level detail on recall times to be set out in the RSIG. This approach is necessary to ensure these matters are consulted on through the rules consultation procedure, so that stakeholders have:

- the opportunity to provide input
- policy certainty

MT PASA process description

The MT PASA process description must be updated by 30 April 2023 to include the collection of recall time and reason code information. Notably, the MT PASA process description will not need to be updated to include the *use* of the new information as this rule does not require its use in the reliability or loss of load probability runs. This is covered in more detail in section 3.1.4 below.

Streamlining

In responding to the consultation paper, many generator stakeholders noted that they considered that the new information collection requirements in AEMO's proposed solution were similar to or duplicative of existing information requirements on generators.[90]The draft rule and determination incorporated this feedback, noting that AEMO would assess where streamlining could occur and, where efficient, remove similar or duplicative requirements. The Commission provided two examples of where streamlining could occur (see below), and noted that AEMO would consider them when implementing the draft rule.

A number of generator stakeholders noted in their submissions to the draft determination, that they wanted more prescriptive obligations placed on AEMO to increase their confidence as to the streamlining that would occur.[91]

The final rule maintains the draft rule's position, that AEMO will clarify information provision requirements, in terms of the information collected and the timeframes covered, and remove requirements or fields within requirements where efficient. The Commission considers it

89 See clause 11.151.2(b) of the amending rule and existing clauses 3.7F(e) and 3.7C(q) of the NER, respectively.
90 Submissions to the consultation paper: AGL, p. 2; Alinta Energy, p. 1; CS energy, p. 2.
91 Submissions to the draft determination: CS Energy, p. 2; Stanwell, p. 3.

inappropriate to be prescriptive on this matter in the rules as most of this streamlining would involve reducing the fields collected by AEMO relating to each particular obligation, not removing the obligations altogether.

Generation information guidelines

Currently, AEMO conducts an annual survey of generator information — the generation information survey — with quarterly updates requested from participants to ensure the survey is up to date. Data is collected on general generator capability, expected availability in each season, and other generator plant information. This information is then used to produce reliability forecasts, among other things, in AEMO's ESOO report.

To reduce any ambiguity for participants on what information should be provided in these surveys, AEMO plans to propose an update to its Generator Information guidelines to clarify what information, and in what circumstances, should be provided via Generation information surveys. AEMO will aim to make any relevant updates to the *Generation information guidelines* in parallel with the other guideline updates necessitated by this rule.

Energy adequacy assessment projection (EAAP) guidelines

AEMO's EAAP report provides information on the impact of potential energy constraints, such as water storages during drought conditions or constraints on fuel supply for thermal generation, on supply adequacy in the NEM. Under the EAAP data collection program, scheduled generators are required to submit information on their expected availability to produce energy, particularly with regard to energy supply constraints.

AEMO is already required to use MT PASA as an input into EAAP[92] so the risk of duplication is low, however the additional information on recall times and reason codes collected under this final rule may reduce the volume and frequency of information that participants will need to provide to AEMO through the generator energy limitation framework (GELF) submissions. AEMO has indicated that it will seek to review, and, if appropriate, update its *EAAP guidelines* so as not to duplicate information collected under this rule.

3.4.3 Alignment with *Updating short term PASA* rule

Stakeholders noted that ST PASA and MT PASA work together and any changes made should ensure alignment between the two. [93] As this rule will commence almost two years before *Updating short-term PASA*, the rule has been made such that it can leverage and integrate effectively with it. The *Updating short term PASA* final rule introduces two components that are related to this rule:

- **A revised definition of PASA availability** — that removes the reference to the 24-hour recall period and instead provides that relevant participants should specify the capacity that can be made available within a given recall period in accordance with the RSIG. AEMO's intention is to separately define the recall period for ST PASA and MT PASA in the RSIG. AEMO has noted that it intends for the MT PASA period to remain as the

92 Rule 3.7C(b)(6)(A) of the NER.

93 Stakeholder submissions to the consultation paper: CS Energy, p.2, Shell p.3, Stanwell, p.3

capacity that can be made available within 24 hours. Thus, for the purposes of MT PASA reporting and assessments, there is likely to be no practical difference between the two approaches once the definition commences. However, AEMO will consult on the new RSIG when it undertakes the update process. This new definition and approach to specifying the PASA availability period in the RSIG will **commence on 31 July 2025.**[94]

- **The PASA objective** — the PASA objective defines the broad philosophy that AEMO would adhere to when administering the PASA system. Defining a PASA objective was consulted on as part of the *Updating Short Term PASA* final rule and the Commission decided it was necessary given the move to a principles-based approach to ST PASA. While the approach to MT PASA remains broadly prescriptive, the Commission considers the PASA objective to be a useful guiding philosophy for AEMO to consider when it develops guidelines and procedures relating to MT PASA. Given that the rule will commence before *Updating ST PASA*, this final rule inserts the PASA objective from *Updating ST PASA* into the NER so that it will commence on **9 October 2023.**[95] For the purposes of this rule, the PASA objective is intended to focus AEMO on collecting information in a way that means Registered Participants are properly informed to enable them to make decisions about supply, demand and outages up to three years in advance.[96]

3.4.4 Alignment with *Integrating energy storage systems into the NEM* final rule

On 2 December 2021, the Commission made the *Integrating energy storage systems into the NEM* (IESS) final rule in response to a rule change request from AEMO.[97]

The IESS final rule makes several changes to better integrate storage and hybrid systems, and allow greater participation in the market. It also adds flexibility into the rules to create a framework that facilitates innovation in how the market supplies energy reliably and securely to meet the long-term interests of energy consumers.

One of the changes in that rule was that scheduled storage assets (5 MW and above) that can transition between generation and consumption linearly (with no dead band around zero) will participate in central dispatch and will be labelled as a "scheduled bidirectional unit". A scheduled bidirectional unit would face many of the same requirements as other scheduled generating units.

To align with this general intent, this final rule will require scheduled bidirectional units to provide reason code and recall times, in the same way as scheduled generating units do, from 3 June 2024, when the IESS rule commences.

94 Schedule 1 of the National Electricity Amendment (Updating Short Term PASA) Rule 2022.

95 For more information on the PASA objective, see the *Updating short term PASA draft determination*, p 22.

96 While the PASA objective refers only to Registered participants, clause 3.7.1(d) of the NER refers to sufficient information to *allow the market to operate effectively* with a minimal amount of intervention by AEMO and thus broadens the stakeholders that are relevant to consider when deciding what information should be collected under PASA.

97 More information on the final rule can be found here: https://www.aemc.gov.au/rule-changes/integrating-energy-storage-systems-nem

ABBREVIATIONS

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
Commission	See AEMC
DUID	Dispatch unit identifier
ENCRC	Energy National Cabinet Reform Committee
ESB	Energy Security Board
ESOO	Electricity statement of opportunities
MCE	Ministerial Council on Energy
MNSP	Market network service provider
MT PASA	Medium term projected assessment of systen adequacy
NEL	National Electricity Law
NEO	National electricity objective
POE	Probability of exceedance
RSIG	Reliabilty standard implementation guideline
TNSP	Transmission network service provider

A SUMMARY OF OTHER ISSUES RAISED IN SUBMISSIONS

This appendix sets out the issues raised in the second round of consultation on this rule change request and the AEMC's response to each issue. If an issue raised in a submission has been discussed in the main body of this document, it has not been included in this table.

Table A.1: Summary of other issues raised in submissions

STAKEHOLDER	ISSUE	AEMC RESPONSE
CS Energy (p.2)	CS Energy noted that MT PASA is limited in how much information it can provide to the market and stakeholders because "there will be shorter term economic constraints that are unlikely to be captured in MT PASA." (p.2)	The Commission acknowledges the fact that MT PASA does not capture information about economic constraints in the short term (i.e. 0-7 days) however does not consider this to be relevant in assessing the merits of this rule change. There are a range of other information sources that serve this purpose including pre-dispatch and Short Term PASA, and assist AEMO and stakeholders in planning for and managing availability in operational timeframes. MT PASA is (by name and nature) a medium-term source of information that is used as a planning tool rather than an operational one.
CS Energy and Shell Energy	CS Energy and Shell both note their agreement that recall times should not be required for all unit states. However, CS Energy suggests that the "final rule clarify that recall times should only be applicable to outages that have non-zero PASA availability" (p.2) Shell suggests that "when a generating unit is on a planned or unplanned maintenance outage and has no recall time, the responsible participant would not be required to submit a recall time. Submission of a	The Commission does not accept CS Energy and Shell Energy's suggestion that recall times should only be required for outages that have non-zero PASA availability. The Commission has made a final rule that allows AEMO (in consultation with stakeholders) to decide which reason codes will also require the entry of a recall time. The intention of this is to collect recall times where this information can usefully inform stakeholders about the reliability outlook. The Commission considers that collecting recall time

STAKEHOLDER	ISSUE	AEMC RESPONSE
	recall time should only be required where PASA availability was greater than zero." (p.2)	information from units with zero PASA availability (i.e. PASA unavailable) *will,* in many cases, be informative for stakeholders in understanding the potential reliability outlook. The Commission encourages stakeholders to engage with AEMO during the RSIG consultation process to provide insight into where recall times can be useful and where it may not be possible or practical to provide this information.
Engie	Engie has suggested that reason code and recall time information will not be valuable as each participant makes different assumptions when generating their inputs to MT PASA, which compromises the quality of the outputs. "Participants may not share the same view of the future state of the market and so the information provided may not be on a consistent basis across the market" (p.1)	The Commission acknowledges that a range of factors will influence a participant when deciding which reason code to enter and calculating the associated recall time (where required). The Commission notes however that the benefit of this information to stakeholders outweighs the risks of small variations in input assumptions. Further, input assumptions vary for any piece of information provided by participants given each has a unique business structure, and strategy and an organisational view of a unit's capabilities, and the future operating environment. The Commission notes that the variation risks are mitigated somewhat by the extra guidance provided in the rules and supporting instruments — in this case the RSIG and MT PASA process description. This supports a level of consistency across all participants. This approach of providing some guidance, and then allowing participants some flexibility to use common sense and accommodate organisational assumptions is used elsewhere in

STAKEHOLDER	ISSUE	AEMC RESPONSE
		the PASA framework and the Rules more broadly. For example when a participant estimates daily PASA availability, the rules specify that they should take into account the ambient weather conditions forecast at the time of the 10% probability of exceedance peak load. Further detail is then provided in the MT PASA process description.
Engie	Engie suggests that the reason and recall time information may not be useful given unplanned outages won't appear in MT PASA until they occur. (p.1)	The Commission acknowledges that unplanned outages will not appear in MT PASA until they occur, and even then, only if the unplanned outage is expected to last for more than seven days. The Commission does not see this as diminishing the value of collecting and publishing information on planned outages over the seven-day to 36 month time horizon, including whether these planned outages are for physical or economic reasons, and how long the expected recall time is for a unit. For unplanned outages that *are* captured by MT PASA (i.e. from seven days onwards) the Commission consider that understanding the reason for the unplanned outage, whether this reason changes within the period of the outage, and the estimated recall time (where required) is relevant and useful information for stakeholders in understanding the future reliability outlook.
Engie	Engie suggest "should the Commission go ahead with implementing this new Rule, then ENGIE recommends that AEMO be subject to a review after a suitable period of time, in order to ascertain	The Commission does not consider a review into whether ad-hoc requests from AEMO have decreased as a result of this rule change is warranted in the circumstances. Reviews by the Commission are resource intensive and are normally reserved

STAKEHOLDER	ISSUE	AEMC RESPONSE
	whether the purported benefits of fewer ad hoc requests for information have indeed materialised." (p.2)	for matters with a higher degree of significance on the national electricity market.
Origin/Snowy	Origin and Snow Hydro both commented that the requirements for reason and recall information should not extend to 36 months as information provided for periods further ahead of real time is less certain and therefore less valuable to stakeholders. Origin noted "participants are unable to confidently schedule the mothballing or temporary commercial withdrawal of units more than one year ahead, given changing market dynamics...any estimates of unit status and recall times beyond 12 months will likely be subject to a high degree of uncertainty and hence offer limited value. Additionally, this runs the risk of sending inaccurate signals to AEMO and the broader market, undermining assessments of future system supply." (p.1) SnowHydro noted "benefits will likely be extremely limited when over a 36 month period...for example the difficulties when estimating generator recall times, particularly during an outage so far in advance, have not been adequately addressed by the Draft rule determination." (p.1)	The Commission considers that collecting reason and recall information over a 36-month period will provide value to stakeholders even when considering that the information provided towards the end of the period is less certain than that provided for periods closer to real time. Furthermore, maintaining a 36-month horizon will support consistency of implementation within the MT PASA framework given PASA availability is also collected for 36 months). The Commission reiterates the points it made in its draft determination that MT PASA requires participants to provide information about their current intentions and best estimates. This means participants need only enter an outage in MT PASA once it is known. The Commission understands that collecting information for only a 12-month outlook would not change the implementation and compliance costs materially. If anything, costs may increase given the system configuration required to implement differing treatments of information provided over 1-year and 3-year timeframes.
Stanwell	Stanwell suggests that the rule change be postponed "in light of these timeframes [relating to the	The Commission along with AEMO, AER and the ESB are mindful that the range of reform processes underway may

STAKEHOLDER	ISSUE	AEMC RESPONSE
	development of the capacity mechanism] and given the wider impact of capacity market reform on the NEM"(p.2)	require upgrades to the same systems and processes. There is work underway, including through AEMO's Regulatory Implementation Roadmap to stage these upgrades, where possible. However, the Commission does not agree that this final rule should be postponed on this basis. The Commission considers this final rule to be in the interests of consumers on an enduring basis and that it will complement and support any capacity mechanism (noting that the capacity mechanism design is being progressed by the ESB). For example, providing better information on generator availability over the medium term to potential investors in firming generation or demand response capability will allow them to make more informed and efficient investment decisions.
Stanwell	Stanwell's view is that "PASA was never designed to provide longer-term reporting and investment signals to the market, nor to predict and alleviate the potential impacts of 'early exit' of coal from the market. The addition of reason codes and recall times in MT PASA does not, in our opinion, bolster current exit arrangements or assist with the management of early generation exits." (p.4) More broadly, Stanwell considers "any shift in the operating regimes of incumbent generators is likely to be sufficiently captured through existing PASA reporting, notice of closure requirements, and other	The Commission agrees that there are other tools available to stakeholders to inform longer term investment signals and confirm plant closure arrangements. The Commission notes that MT PASA is "a comprehensive program of information collection, analysis, and disclosure of medium term... power system security and reliability of supply prospects so that Registered Participants are properly informed to enable them to make decisions about supply, demand and outages of transmission networks in respect of periods up...3 years in advance, where specified" (NER clause 3.7.1(b)) Through PASA, all stakeholders should also be able to access "sufficient information to allow the market to operate

STAKEHOLDER	ISSUE	AEMC RESPONSE
	reporting tools. We consider that existing reporting requirements currently provide the relevant information for AEMO and the market to assess generator availability over the short, medium, and longer-term." (p.4)	effectively with a minimal amount of intervention by AEMO." The Commission considers that together, these two elements of the PASA framework support the need for enhanced information over the medium term in the form of reason codes and recall time, especially given the changing NEM dynamics. Contrary to Stanwell's comments, the Commission considers this information can: • provide investment signals • help alleviate the potential impact of early exit • provide more detail to help AEMO and the market assess generator availability over the medium-term. The Commission has outlines a range of other benefits in Chapter 2 of the final determination.

B LEGAL REQUIREMENTS UNDER THE NEL

This appendix sets out the relevant legal requirements under the NEL for the AEMC to make this final rule determination.

B.1 Final rule determination

In accordance with ss. 102 and 102A of the NEL the Commission has made this final rule determination in relation to the rule proposed by AEMO.

The Commission's reasons for making this final rule determination are set out in section 2.2.

A copy of the more preferable final rule is attached to and published with this final rule determination. Its key features are described in chapter 3.

B.2 Power to make the rule

The Commission is satisfied that the more preferable final rule falls within the subject matter about which the Commission may make rules. The more preferable final rule falls within s. 34 of the NEL as it relates to regulating the activities of persons participating in the national electricity market or involved in the operation of the national electricity system.[98]

B.3 Making a more preferable rule

Under s. 91A of the NEL, the Commission may make a rule that is different (including materially different) to a proposed rule (a more preferable rule) if it is satisfied that, having regard to the issue or issues raised in the rule change request, the more preferable rule will or is likely to better contribute to the achievement of the NEO. In this instance, the Commission has made a more preferable rule. The reasons are summarised in section 2.2.

B.4 Making a differential rule

Under the Northern Territory legislation adopting the NEL, the Commission may make a differential rule if, having regard to any relevant MCE statement of policy principles, a different rule will, or is likely to, better contribute to the achievement of the NEO than a uniform rule. A differential rule is a rule that:

- varies in its term as between:
  - the national electricity system, and
  - one or more, or all, of the local electricity systems, or
- does not have effect with respect to one or more of those systems

but is not a jurisdictional derogation, participant derogation or rule that has effect with respect to an adoptive jurisdiction for the purpose of s. 91(8) of the NEL.

98 Sections 34(1)(a)(i) and (iii) of the NEL.

As the rule relates to parts of the NER that currently do not apply in the Northern Territory, the Commission has not assessed the rule against the additional elements required by the Northern Territory legislation.[99]

B.5 Commission's considerations

In accordance with s. 103 of the NEL, the Commission has made a rule. In assessing the rule change request the Commission considered:

- its powers under the NEL to make the rule
- the rule change request
- submissions received during first and second rounds of consultation
- the Commission's analysis as to the ways in which the proposed rule will or is likely to, contribute to the NEO.

There is no relevant Ministerial Council on Energy (MCE) statement of policy principles for this rule change request.[100]

The Commission may only make a rule that has effect with respect to an adoptive jurisdiction if satisfied that the proposed rule is compatible with the proper performance of AEMO's declared network functions.[101]The more preferable final rule is compatible with AEMO's declared network functions because it does not affect those functions at all.

B.6 Civil penalties

The Commission cannot create new civil penalty provisions. However, it may recommend to the Energy Ministers' Meeting that new or existing provisions of the NER be classified as civil penalty provisions.

The Commission's final more preferable rule inserts a new civil penalty provision in clause 3.7.2 of the NER. The new provision that the Commission is recommending to the Energy Ministers Meeting is clause 3.7.2(d1)

The Commission considers that this new paragraph should be classified as a tier 1 civil penalty provision for consistency with the similar provision in clause 3.7.2(d). This existing paragraph is currently classified as a tier 1 civil penalty provision under NER Schedule 1 of the National Electricity (South Australia) Regulations. The AEMC consulted with the AER with respect to the proposed classification for the civil penalty provision to be recommended for the final rule. The AER is supportive of the AEMC's recommendations.

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99 From 1 July 2016, the NER, as amended from time to time, apply in the NT, subject to derogations set out in regulations made under the NT legislation adopting the NEL. Under those regulations, only certain parts of the NER have been adopted in the NT.(See the AEMC website for the NER that applies in the NT.) National Electricity (Northern Territory) (National Uniform Legislation)Act2015.

100 Under s. 33 of the NEL the AEMC must have regard to any relevant MCE statement of policy principles in making a rule. The MCE is referenced in the AEMC's governing legislation and is a legally enduring body comprising the Federal, State and Territory Ministers responsible for energy. On 1 July 2011, the MCE was amalgamated with the Ministerial Council on Mineral and Petroleum Resources. The amalgamated council became the COAG Energy Council, and is now the Energy Ministers Meeting.

101 Section 91(8) of the NEL.

B.7 Conduct provisions

The Commission cannot create new conduct provisions. However, it may recommend to the Energy Ministers Meeting that new or existing provisions of the NER be classified as conduct provisions.

The final rule does not amend any rules that are currently classified as conduct provisions under the NEL or National Electricity (South Australia) Regulations. The Commission does not propose to recommend to the Energy Ministers Meeting that any of the proposed amendments made by the final rule be classified as conduct provisions.

C RULE MAKING PROCESS

C.1 The rule change request

On 15 December 2021 AEMO submitted a rule change request to the AEMC identifying that changes in generator operating regimes, driven by the rapid transition of the NEM's generation fleet to a lower-emissions generation profile, may bring uncertainties and therefore challenges in maintaining system security and reliability.[102]

AEMO proposed that more detailed information be collected and published about scheduled generator availability in the MT PASA. Specifically, the proposed rule amends clause 3.7.1 and 3.7.2 of the NER and relevant definitions so that generators would report, and AEMO would publish, a unit's status through reason codes, and associated recall times when triggered through a reason code.

The rule change request notes that this would improve the transparency of information available to market participants, jurisdictions, and market bodies. This information would allow for improved operational, market and investment decisions by all stakeholders.

The request actions the ESB's *managing early exists* recommendation from the post 2025 reform package - a suite of reforms made by the ESB to meet the needs of the energy transition underway.[103] The ESB recommendation, and as a result, this rule change request, seek to increase information provision around mothballing and seasonal shutdowns to support notice of closure requirements.

The rule change request includes a draft rule and a copy can be found on the AEMC website.[104]

C.2 Rationale for the rule change request

The rule change request states that the rapid transition of the NEM's generation fleet to a lower-emissions generation profile will bring uncertainties and therefore challenges in maintaining system security and reliability.

It then refers to the ESB's *post-2025 market design final advice to energy ministers*, and documents in particular noting that the transition will drive further changes to plant operating regimes whereby owners of legacy thermal generation seek to reduce their overheads if low wholesale prices are expected.[105] These changes may include mothballing of units for prolonged periods of time and/or seasonal shutdowns or cyclical running regimes.

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102 Changes in operating regimes could include mothballing of units for prolonged periods of time and/or seasonal shutdowns or cyclical running regimes e.g. weekday/weekend, day/night

103 See ESB's recommendation 1(a)(ii) which is to: Instruct the ESB to prepare a rule change for submission to the AEMC to implement enhancements to existing generator exit mechanisms to provide greater transparency of generator availability In agreeing to the recommendation National Cabinet noted that the rule change request should be prepared in consultation with senior officials and that AEMO should notify jurisdictions if a change in generator availability results in a breach of that jurisdiction's adopted reliability standard.

104 The rule change request submitted by AEMO on 15 December 2021 can be found here: https://www.aemc.gov.au/rule-changes/enhancing-information-generator-availability-mt-pasa

105 ESB's post 2025 market design final advice documents can be found here: https://esb-post2025-market-design.aemc.gov.au/final-advice-july-2021

The challenges identified in the rule change request include:

- operational challenges such as a reduction in available units leading to lack of reserve or essential system services, as well as a lack of standardised information on when generators are available or could be made available into the future
- limitations on the ability of participants to use MT PASA reporting for coordinating maintenance schedules
- increased complexity for the AER in assessing compliance under the current notice of closure arrangements
- weakened investment signals for potential replacement plant if it is unclear why existing units are unavailable.

C.3 Solution proposed in the rule change request

The key change proposed by AEMO in the rule change request is the reporting and publication of:

- a unit's status through reason codes via MT PASA in accordance with the relevant international standard, tailored to a domestic context[106]
- recall times via MT PASA when triggered through a reason code.

AEMO proposes amendments to clause 3.7.1 and 3.7.2 of the NER and relevant definitions to bring this change into effect.

C.4 The rule making process to date

On 3 February 2022, the Commission published a notice advising of its commencement of the rule making process and consultation in respect of the rule change request.[107] A consultation paper identifying specific issues for consultation was also published. Submissions closed on 3 March 2022.

The Commission received eight submissions as part of the first round of consultation. The Commission considered all issues raised by stakeholders in submissions. Issues raised in submissions are discussed and responded to throughout this draft rule determination. A summary of the issues raised in submissions and the Commission's response to each issue is contained in appendix C of the draft determination document.[108]

The Commission published its draft rule determination and more preferable draft rule on 26 May 2022**.** Submissions closed on 7 July 2022**.**

The Commission received seven submissions in this second round of consultation. The Commission considered all issues raised by stakeholders in submissions. Many of the issues raised in submissions are discussed and responded to throughout this final rule determination. A summary of the other issues raised in submissions and the Commission's response to these is contained in Appendix A**.**

106 IEEE Std 762-2006: *Definitions for use in reporting electric generating unit reliability, availability and productivity*
107 This notice was published under s.95 of the National Electricity Law (NEL).
108 AEMC *Enhancing information on generator availability in MT PASA draft determination,* 26 May 2022, p. 47-50

D CONTEXT FOR RECENT CONCERNS AROUND GENERATOR AVAILABILITY

Starting with the closure of Northern and Hazelwood power station in 2016 and 2017, a number of events have occurred that have shaped the public dialogue around generator availability. These are summarised in the table below along with a range of actions that have already been taken in response:

Table D.1: Key events in public discussion of future thermal generator availability

DATE	EVENT
2015 -2016	Playford B power station closure in October 2015 and Northern power station closure in May 2016 — 11 months notice of closure was provided. Following closure, there were large increase in SA wholesale electricity prices.
September 2016	South Australia black system event — creating widespread concern and a public dialogue around power system security and reliability.
March 2017	Hazelwood power station closure — five months notice of closure was provided. Following its closure there were large increases in VIC wholesale electricity prices.
November 2018	AEMC makes *Generator three-year notice of closure* rule — introducing the requirement for generators to provide 36 months notice to the market of their intention to close. The rule was made to promote reliability outcomes in the NEM, such that the market is provided with sufficient notice of closures to enable the market time to respond, minimising the likelihood of any price shocks. A more fulsome summary can be found below.
July 2019	Retailer reliability obligation (RRO) introduced to provide stronger incentives for market participants to invest in the right technologies in regions where it is needed, to support reliability in the NEM. Notice of closure period increased to 42 months to better align with RRO.
2019-2021	Liddell power station closure date is changed multiple times in response to changing market conditions and public/political pressure — highlighting the multiple factors weighing on generators' decisions to exit the market.
2020-2021	ESB conducts post-2025 project, developed reforms to meet the needs of the transition. A key workstream of this was focussed on options to support resource adequacy and manage thermal exit.
February 2020 - 2021	VIC & QLD Experiencing similar periods of negative pricing to SA — but both states have multiple coal plants, unlike SA — concerns they may seasonally shut down to avoid low wholesale prices.
November 2020	RRO trigger changed to align the declaration of a forecast reliability gap with the interim reliability measure (no more than 0.0006 per cent

DATE	EVENT
	unserved energy per annum) that commenced in August 2020. Energy Ministers agreed to this to improve reliability during the transition to the post-2025 market design.
March 2021	Yallourn power station closure brought four years forward to mid-2028. While consistent with notice of closure arrangements, increased concerns that coal-fired power stations may exit the market earlier than expected due to continuing decreases in daytime wholesale prices.
September 2021	ESB's Post 2025 reform package agreed by National Cabinet including resource adequacy mechanism actions
October 2021	Torrens island unit B1 mothballed with a return to service period of 6 months — highlighting the potential benefit of standardising and automating the gathering of information on their availability if more units start to follow this trend.
February 2022	AGL announced that Bayswater power station would be closing two years earlier in 2033, and Loy Yang A power station would be closing 3 years earlier in 2045.
February 2022	Origin announced that the closure of Eraring power station would be brought seven years forward to 2025
April 2022	Federal Energy Minister, Angus Taylor submitted a rule change request to the AEMC to increase the notice of closure period to five years, as well as making it more difficult for generators to mothball indefinitely prior to their closure.
June 2022	A combination of factors including planned and unplanned generation outages, planned transmission outages, periods of low solar and wind output and increased demand for electricity and gas due to the early onset of winter led to a number of days of very tight supply conditions, the breaching of the cumulative price cap, the implementation of the administered price cap, and eventually AEMO suspending the market for 10 days.

Source: collated by the AEMC based on publicly available information

While the impacts of these events on power system security and reliability have varied from minimal to material, unexpected changes in unit availability continue to be a concern.

E SIMILAR INFORMATION PROVISION REQUIREMENTS IN THE NER

The Commission has tabulated NER requirements relating to information provision on generator availability. These are shown below:

Table E.1: **NER requirements relating to information provision on generator availability**

INSTRUMENT OR PROCESS	DESCRIPTION	TIME HORIZON	INFORMATION COLLECTION FREQUENCY
ST PASA	ST PASA is the tool AEMO uses to forecast reliability and security in the NEM up to seven days ahead. Scheduled generators must submit their available capacity under expected market conditions	Present - 7 days (Operational timeframe)	Update as frequently as changes occur
Clause 4.9.9 of the NER	Requires scheduled generators to notify AEMO of any events that change or are likely to change the operational availability of a generating unit.	Operational timeframe	Update when a generator is aware of an event that would change unit avilability
MT PASA	MT PASA is the tool that AEMO uses to forecast and inform the market of reliability over the period from 7 days to 36 months ahead. This is done primarily to elicit a response from the market.	7 days - 36 months (Planning timeframe)	Update as frequently as changes occur
Clause 4.8.5A of the NER (Outage recall portal)	Allows AEMO to request information on plant status and any expected or planned outages and an indication of the possibility of either deferring or recalling from an outage, to determine the latest time that AEMO could intervene.	Operational timeframe	As requested by AEMO
Generator notice of closure	Scheduled generators must inform market of their intention to exit the market at least 42 months before doing so. Retirement dates cannot be moved to < 42 months from present without exemption from AER.	Planning and investment timeframe	Update as frequently as changes occur

INSTRUMENT OR PROCESS	DESCRIPTION	TIME HORI-ZON	INFORMATION COLLECTION FREQUENCY
Summer readiness reporting	Key industry players provide AEMO with the requisite information to assess the readiness of the power system to operate reliably through the summer period.	3 - 4 months (Planning timeframe)	Annually upon request from AEMO
Energy adequacy assessment projection (EAAP) / Generator energy limitation framework (GELF)	EAAP forecasts electricity supply reliability in the NEM over a 2 year horizon. It gives particular consideration to water and fuel availability and its potential variability. Generators are required to submit details on plant energy constraints to AEMO through the GELF	24 months (Planning timeframe)	Annually & when new info that may materially alter most recent EAAP becomes available. GELFs submitted quarterly
Electricity statement of opportunities (ESOO)	The ESOO forecasts electricity supply reliability in the National Electricity Market (NEM) over a 10-year period to inform decisions by market participants, investors, and policy-makers. As part of this process AEMO surveys participants of their expected unit capability across the year.	10 years (Planning and investment timeframe)	Annual with Quarterly Updates - Generators should update AEMO as soon as practicable on any changes

Source: Compiled by AEMC from Rules

F INTERACTION WITH EXISTING REGULATORY FRAMEWORKS AND PROCESSES

F.1 Administration of MT PASA

PASA is a key part of the reliability framework in the NEM. It is one component of the information that AEMO must publish to inform the market of prevailing and forecast conditions, and when reserves may be running low, to elicit a market response. PASA is AEMO's principal method of forecasting the adequacy of the power system to stay within the reliability standard i.e. will there be enough supply to meet forecast demand? It is a requirement under the NER that AEMO administer PASA processes.[109] To determine if there is sufficient capacity expected to be available to meet forecast demand over the medium term (2-3 year) time horizon, AEMO employs the medium term PASA process. MT PASA essentially "picks up" from the notice of closure and ESOO frameworks and hands-off to the ST PASA process around a week ahead of dispatch, and as such is not used for real-time or short-term decision-making.

Under the current MT PASA process, AEMO collects from participants the capacity that each dispatch unit could make available given 24 hours of notice.[110] Participants submit their expected plant availability for the next 36 months and are required to update their PASA submission on an ongoing basis to ensure it matches their current intentions and best estimates. Notably, plant availability is distinct from a participant's intention to generate, it represents the availability of plant to generate if market conditions are favourable to do so. This is distinct from ST PASA where availability signals that a participant is willing to generate at or above a certain wholesale price.

AEMO produces 50% probability of exceedance (POE) and 10% POE demand forecasts for the next 24 months. These two forecasts and other information (from TNSPs and MNSPs, weather, wind, etc) are then combined to assess a number of factors including the likelihood of the reliability standard being breached and the probability of lost load on a given day.[111] The process for assessing any projected failure to meet the reliability standard is detailed in AEMO's RSIG.[112]

AEMO collects availability information from participants and publishes the MT PASA once a week, with daily resolution and a 24-month forecast horizon. Additional to the forecast results, they also publish PASA availability and, under this final rule, unit state (or reason codes) and recall time (where required) by dispatch unit, over a 36-month forecast horizon, again with a daily resolution.[113] Participants use this information to assist them in their operational and investment decision-making, most commonly for outage scheduling.

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109 Clause 3.7.1(a) of the NER.

110 See the definition of 'PASA availability' as defined in the NER Chapter 10.

111 For more detail on the inputs prepared by AEMO for MT PASA, see clause 3.7.2(c) of the NER.

112 The RSIG sets out how AEMO will implement the reliability standard and the interim reliability measure. More detail on what they cover can be found in clause 3.9.3D of the NER.

113 For more detail on the information published by AEMO for MT PASA see clause 3.7.2 of the NER.

F.2 Three year notice of closure

In 2018, following concerns around the high and volatile wholesale energy prices that occurred after the closure of Northern and Hazelwood power stations, the AEMC made the *Generator three year notice of closure* Rule.

The Rule requires participants to advise AEMO of the expected closure year for all their scheduled and semi-scheduled generation units over 30MW. It also requires generators to give AEMO at least 42 months notice of their intention to permanently retire a generating unit unless they are granted an exemption by the AER. Civil penalties apply if generators fail to comply with their obligations (clause 2.10.1 of the NER).

The AER maintains flexibility in determining what criteria to apply when considering applications for exemption and assesses each application on a case by case basis. In general, they are guided by the NEO but it also provides a brief, non-binding list of factors that may be given regard to, including, but not limited to:

- the reliability and security impact of the generator's early exit — the AER will engage with AEMO as it considers applications for exemption to further its understanding of this issue and may also talk to relevant network service providers
- plans for replacing the capacity being retired, if any
- whether the application for exemption is necessitated by a requirement to meet a competing or changing legal or regulatory obligation
- if the application for exemption is necessitated by urgent and unforeseen circumstances.

The rule does not constrain decisions by generators to place generating units into dry storage (i.e. mothball them) or to otherwise make them temporarily unavailable. Until their classification is terminated, generators are expected to continue to maintain procedures and records consistent with the NER or "good electricity industry practice" and so their generating units comply with the relevant generator performance standards, regardless of their availability.

Also, until their classification is terminated, AEMO can direct them to generate if AEMO is satisfied that it is necessary to do so to maintain or re-establish the power system to a secure operating state, a satisfactory operating state, or a reliable operating state.

The notice of closure framework serves a different purpose to MT PASA — giving a hard "end date" to a generator's availability, not a dynamic picture of availability over time. It is however relevant in the context of the final rule *Enhancing information on generator availability in MT PASA* in that both seek to assist the market in operational, planning and investment decisions to ensure future supply levels to meet demand. Where the notice of closure framework can indicate when permanent replacement supply will be needed, the MT PASA framework, now with the new reason and recall time information required by this final rule can assist stakeholders in understanding how and why generator availability may change in the lead-up to the closure dates. As well as contributing to longer term investment decisions, this will inform nearer term operational and planning decisions and potentially highlight opportunities for smaller or more dynamic resources like demand response to fill short-term gaps in supply. The new reason and recall time information also adds visibility to

the practice of placing units into dry storage — something that does not show up in the notice of closure framework and was previously not clear except by inferring such based on long periods of zero PASA availability entries in MT PASA.

More information can be found on the *Generator three year notice of closure project page* which can be found here: https://www.aemc.gov.au/rule-changes/generator-three-year-notice-closure

More information about the AER's *Generator notice of closure guideline* can be found here: https://www.aer.gov.au/system/files/Generator%20notice%20of%20closure%20exemption%20guideline_1.pdf

F.3 Special arrangements between jurisdictions and AEMO relating to jurisdiction-specific reliability matters

AEMO plays a range of jurisdictional specific roles when it comes to supporting reliability in specific jurisdictions in specific ways. These will continue to play a role within the NEM-wide reliability frameworks.

For example:

- The South Australian Advisory Functions (SAAF) is a collection of independent reports prepared by AEMO and published for the South Australian jurisdiction under Section 50B of the National Electricity Law. Under these provisions, the South Australian Government may also request AEMO to undertake additional advisory functions for the South Australian Declared Power System.[114] Through the SAAF, AEMO provides (among other things) advice on the Supply adequacy and system security outlook or the South Australian Power system.
- In Victoria, AEMO has several unique jurisdictional roles including planning the Victorian transmission network and energy emergency management responsibilities.[115][116]Through these functions AEMO supports Victoria in delivering secure and reliable outcomes in a wide range of ways.
- AEMO is in discussions with New South Wales to establish a process for AEMO in its role as NSW Energy Security Target (EST) Monitor to formally notify NSW if there has been a material change in relevant MT PASA or ESOO inputs (including, but not limited to,

114 This is a jurisdictional-specific function of AEMO under its 'additional advisory functions' in South Australia. More info here: https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/south-australian-advisory-functions

115 In order to effectively plan what transmission network infrastructure is needed, AEMO follows a defined planning process and methodology that draws on key reports, projections and feasibility studies, including the Victorian Annual Planning Report (VAPR) and regulatory investment tests for transmission. More info here: https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/victorian-planning

116 AEMO's emergency management responsibilities in Victoria are detailed in the Victorian Electricity Emergency Communications Protocol (VEECP). The VEECP was established to ensure timely advice and information is coordinated between stakeholders when responding to an energy incident. Signatories to the VEECP include AEMO, Victorian distribution businesses, the Victorian Government, and emergency services across Victoria. More info here:https://aemo.com.au/en/energy-systems/electricity/emergency-management/victorian-role

generator availability and planned transmission and distribution outages and limits) that has the potential to result in a breach of the EST.[117]

It is worth noting that AEMO is also in regular discussions with all jurisdictions on a range of matters including ongoing reliability and security issues.

The Commission has not placed any new reporting obligations on AEMO to be drafted into the rules to support further notification to jurisdictions of changes in reliability standards as it considers existing formal processes outlined in the Rules, alongside the range of formal and informal channels existing between AEMO and jurisdictions are sufficient.[118]

F.4 Interactions with ESB post-2025 reliability reforms

In October 2021, the National Cabinet endorsed the final package of reforms presented by the ESB as agreed by the ENCRC in September 2021.

The ESB's post 2025 market design reforms detail a redesign of the NEM to enable the provision of the full range of services to customers necessary to deliver a secure, reliable and lower emissions electricity system at least cost. They are spread across four reform pathways:

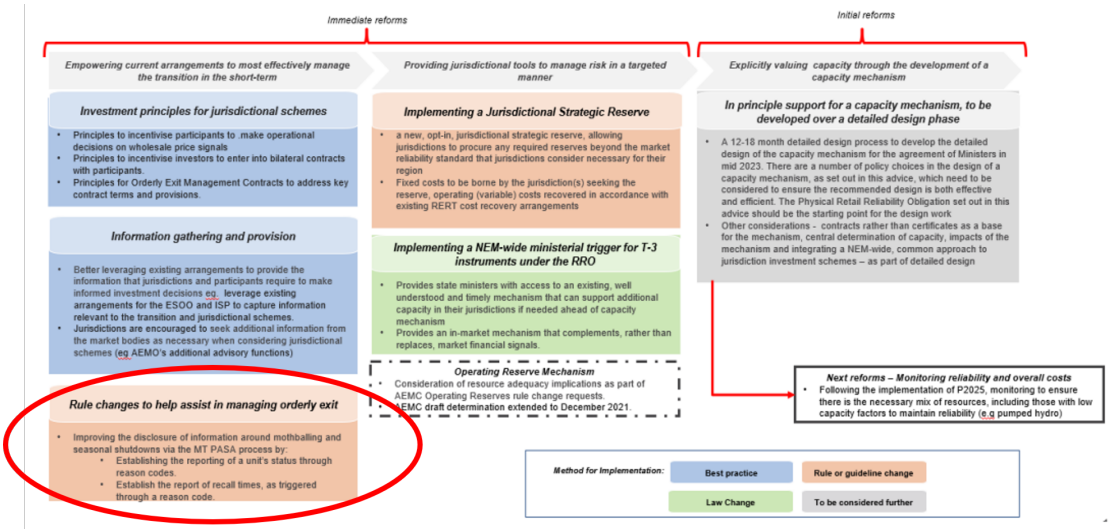
1. resource adequacy
2. essential system services
3. transmission
4. distributed energy resources.

The ESB made six recommendations as part of its post-2025 resource adequacy reform package. The actions are pictured below:

117 The EST Monitor is established under New South Wales jurisdictional legislation being the *Electricity Infrastructure Investment Act 2020*. More information about the EST Monitor can be found here: https://www.energy.nsw.gov.au/government-and-regulation/electricity-infrastructure-roadmap/entities-delivering-roadmap#-the-energy-security-target-monitor-

118 Energy Ministers had noted, when agreeing to the ESB's recommendation that was the catalyst for this rule change request, that AEMO should notify jurisdictions if a change in generator availability results in a breach of that jurisdiction's adopted reliability standard. The Commission is satisfied that this already occurs under current arrangements. Stakeholders did not comment on this matter during the consultation process.

Figure F.1: MT PASA enhancements in the context of other ESB resource adequacy and ageing thermal reforms



Source: ESB *post 2025 market design final advice to Energy Ministers Part B,* 27 July 2021, page 20.

Note: the six RAM actions are: adopting investment principles for jurisdictional schemes, information gathering and provision, managing early exits, implementing a jurisdictional strategic reserve, implementing a NEM-wide ministerial trigger for T-3 instruments under the RRO, developing a new capacity mechanism.

The six recommendations are intended to work together to support the orderly retirement of thermal generators and timely investment in an efficient mix of new resources. This final rule E*nhancing information on generator availability in MT PASA* actions the *"managing early exits"* recommendation.[119]

The Commission considers the final rule *Enhancing information on generator availability in MT PASA* to be in the interests of consumers on an enduring basis regardless of the progress and final outcomes reached for each of the five other recommendations. Improving information transparency on availability will complement and support each of the above recommendations in different ways.

For example, providing better information to stakeholders on generator availability over the medium term can:

- guide jurisdictional governments in applying the **investment principles for jurisdictional schemes**

119 The specific *"managing early exits"* recommendation agreed by Energy Ministers and endorsed by the National Cabinet, was to "*Instruct the ESB to prepare a rule change for submission to the AEMC to implement enhancements to existing generator exit mechanisms to provide greater transparency of generator availability".* In agreeing to the recommendation National Cabinet noted that the rule change request should be prepared in consultation with senior officials (consultation occurred at the November 2021 ESOM meeting) and that AEMO should notify jurisdictions if a change in generator availability results in a breach of that jurisdiction's adopted reliability standard. The final rule does not propose further formal reporting obligations to be drafted into the NER at this time given AEMO's existing obligations and regular discussions with jurisdictions support the outcome sought by Ministers.

- provide a more detailed and nuanced data set should jurisdictions proactively **gather information** from AEMO when designing investment schemes or making investment decisions
- inform potential investors to make more informed and efficient investment decisions, reducing the risk of reserve shortfalls and the need for emergency tools such as the **jurisdictional strategic reserve**
- provide additional insight for AEMO and Ministers when deciding whether to use the **ministerial trigger for T-3 instruments under the RRO**
- assist policymakers in diagnosing reliability problems so that new mechanisms such as the **capacity mechanism** are well-targeted.