



Consultation on Guide to Generator Exemption and Classification of Generating Units

Information paper

Published: November 2022

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Executive Summary

The publication of this Information Paper commences the consultation process (Consultation) conducted by AEMO (Australian Energy Market Operator) to consider proposed changes (Changes) to the Guide to Generator Exemption and Classification of Generating Units (Guide) in accordance with the National Electricity Rules (NER), under the National Electricity Amendment (Integrating energy storage systems into the NEM (National Electricity Markets)) Rule 2021 No. 13 (IESS (Integrating Energy Storage Systems) Rule).

AEMO has prepared this Information Paper to inform stakeholders and initiate feedback by industry in respect of the Changes.

In summary, the Changes are to:

- implement the IESS Rule;
- amend the Guide to be consistent with the IESS High Level Design; and
- articulate AEMO's terms and conditions for classifying integrated resource systems (IRS) for DC-coupled systems.

AEMO invites stakeholders to:

- provide feedback and comments on this Information Paper, as well as the accompanying change-marked version of the Guide; and
- identify any unintended adverse consequences of the Changes.

Stakeholders are invited to submit written responses on this Information Paper, including the questions which are identified in this Information Paper, by 5pm Wednesday 21 December 2022.

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1. Stakeholder Consultation Process

AEMO has established a comprehensive stakeholder engagement program to ensure the effectiveness of the Consultation. This program comprises:

- This Consultation.
- IESS Working Group (IESS-WG) for affected participants and other related bodies.
- Information sessions on policy matters undertaken by the IESS-WG, as required.
- Discussion with individual stakeholders, as required.
- Dedicated webpage¹ and IESS mailbox (IESS@aemo.com.au) for stakeholder enquiries.
- Additional forums to be established in the second half of 2022 for the broader implementation of the NEM2025 Implementation Roadmap.²

AEMO is consulting on the Changes in accordance with the rule consultation procedure in NER 8.9. The Changes will align the Guide with the NER, as amended by the IESS Rule. The Guide forms part of the registration information resource and guidelines that AEMO maintains under NER 2.1.3(a).

AEMO's indicative timeline for the Consultation is as follows.

Deliverable	Indicative date
Information Paper and marked up Guide published	2 November 2022
Submissions due on Information Paper and marked up Guide	21 December 2022
Draft Guide published	13 February 2023
Submissions due on Draft Guide	13 March 2023
Final Guide published	14 April 2023

Prior to the due date for submissions on the Information Paper, stakeholders can request a meeting with AEMO to discuss any issues in respect of the Changes, or more generally, via email IESS@aemo.com.au.

A list of abbreviations used in this Information Paper is at Appendix A.

¹ At <https://aemo.com.au/initiatives/major-programs/integrating-energy-storage-systems-project>.

² For current version of the Roadmap, see <https://aemo.com.au/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/reform-delivery-committee>.

2. Background

On 2 December 2021, the Australian Energy Market Commission (AEMC) made its Final Determination on the IESS Rule, to integrate storage and aggregate systems into the National Electricity Market (NEM).

The IESS Rule takes a significant step toward a technology agnostic two-way market model for the NEM. These changes anticipate, and help prepare the NEM for, future steps being envisioned through the Energy Security Board's (ESB's) Post-2025 Market Design initiative.

To implement the IESS Rule, AEMO will be introducing changes over the following two releases:

The Initial Release will implement transitional arrangements to 31 March 2023, including:

- Integrated Resource Provider (IRP) category registrations and associated classifications of Integrated Resource Systems (IRS) and Bidirectional Units (BDU), with a grace period for existing IRPs;
- Aggregate Dispatch Conformance (ADC) for participants to opt in with two or more technologies behind the connection point; and
- The option for small generating units to provide FCAS (Frequency Control Ancillary Services).

The Final Release will complete the full implementation of the IESS Rule on 3 June 2024, including:

- Changes to settlement based on gross energy, non-energy cost recovery as well as changes to unaccounted for energy (UFE) calculations and embedded networks; and
- Aggregation of small resources by IRP category.

3. Overview of changes

The Changes will implement the IESS High Level Design³ and will resolve the issues that have been raised through the IESS Final Strawperson⁴. The Changes focus on:

- Classification of aggregate systems and coupled production units under the IESS Rule;
- AEMO's terms and conditions for classifying IRS under the updated framework, particularly when part of a DC-coupled IRS;
- the treatment of DC-coupled systems in relation to AEMO's current 5MW - 30MW generator exemption and the 5MW battery exemption; and
- any other key policy or design issues which are related to classification under the IESS Rule.

Questions

- **What changes, if any, are missing from the HLD (High Level Design) or Final Strawperson that have not been addressed in the Guide?**
- **What other changes should be reflected?**

³ AEMO website <https://www.aemo.com.au/-/media/files/initiatives/submissions/2021/iess/integrating-energy-storage-systems---high-level-design---final.pdf?la=en>

⁴ AEMO website <https://www.aemo.com.au/-/media/files/initiatives/submissions/2022/iessi-strawperson-final.pdf?la=en>

3.1. Terms and conditions for classifying DC-coupled units as semi-scheduled generating units

3.1.1. Classifying coupled production units

A coupled production unit is a unit with separate plant for the production of electricity, each of a different type capable of separate operation, that share equipment, e.g., an inverter, which is essential to the functioning of each. The plant is typically bidirectional and intermittent.

A coupled production unit is classified when one or one of a group of coupled production units connected at a common connection point with a nameplate rating of 5 MW or more, meet the criteria which are set out in the Guide.

3.1.2. Terms and conditions

NER 2.2.7 (c1) provides:

(c1) AEMO may, on an application being made for the purposes of paragraph (b), approve on such terms and conditions as AEMO considers appropriate, classification of a bidirectional unit that is a coupled production unit as a semi-scheduled generating unit if AEMO is satisfied that:

- (1) the output of some or all generating plant comprised in the bidirectional unit is intermittent;*
- (2) except for auxiliary load, the bidirectional unit will not consume electricity delivered from the national grid at the connection point for the bidirectional unit; and*
- (3) the person:*
 - (i) has submitted data in accordance with schedule 3.1 and paragraph (c3);*
 - (ii) has submitted an energy conversion model; and*
 - (iii) has adequate communications and telemetry to support the issuing of dispatch instructions and the audit of responses.*

NER 2.2.7 (c3) states:

When a person submits data under schedule 3.1 for a coupled production unit that it wishes to classify as a semi-scheduled generating unit under paragraph (c1), the maximum generation must be limited to the maximum generation of that part of the coupled production unit that is intermittent.

Under NER 2.2.7 (c2) any person who applies under NER 2.2 (c1) must comply with terms and conditions imposed by AEMO. To keep the existing flexibility of semi-scheduled classification, AEMO’s proposed terms and conditions (outlined in Section 5.8 of the Guide) are summarised in Table 1 below.

Table 1 AEMO’s Proposed terms and conditions for classifying DC-coupled units

AEMO proposed terms and conditions	Basis
1 The non-intermittent capacity must be less than 5 MW.	Aligns with scheduling requirements for BDUs (Bidirectional Units) in an IRS. Agreed with AEMC in Final Determination.
2 The non-intermittent capacity must be less than 2.5% of the intermittent capacity, unless the participant commits to providing a self-forecast for dispatch purposes.	2.5% reflects the average dispatch error of intermittent capacity in the NEM. Imposing this condition avoids a detrimental impact on AEMO’s operations.

AEMO proposed terms and conditions	Basis
3 DC SCADA feeds are provided for the intermittent capacity and the non-intermittent capacity (in addition to AC output feed).	Required for operational awareness, operational forecasting, and long-term forecasting purposes.

AEMO will consider an application for classification of a coupled production unit as a semi-scheduled generating unit under these terms and conditions, to avoid any need for significant changes to operational forecasting systems and long-term forecasting systems.

AEMO’s proposed conditions provide consistent treatment between coupled production units and other aggregated systems, where classified as scheduled if at a capacity of less than 5 MW. AEMO’s operations rely on intermittent generation forecasts for semi-scheduled generating units, which do not consider the forecast behaviour of a battery within a coupled production unit.

The 2.5% is based on an average dispatch error for variable renewable energy (VRE) calculated as the Normalised Mean Absolute Error (NMAE) across all regions as a percentage of NEM installed capacity. The 2020-21 to 2021-22 NMAE is 2.44% for Solar and 2.26% for Wind⁵. Therefore, AEMO proposes to use 2.5% as is uniform across the technologies.

AEMO could periodically review the average dispatch error threshold of 2.5%, as a basis for industry feedback, as well as to capture any changes to technologies into the future.

Questions
<ul style="list-style-type: none"> • How suitable are the proposed terms and conditions and why? • What other terms and conditions should be considered and why? • What are your views on AEMO periodically reviewing and updating the average dispatch error threshold (currently 2.5%)?

3.2. Applications for exemptions of production systems

The same general principle applies where persons who own, operate, or control any generating system or integrated resource system with a nameplate rating of 30MW or more must apply for an exemption.

For less than 5 MW to greater than 30 MW generating units, exemption levels are split into three categories for the 3 June 2024 release, as set out in Table 2.

Table 2 AEMO’s proposed exemptions for generating systems to include IRS

Less than 5 MW aggregate capacity	Between 5 MW- 30 MW aggregate capacity	Greater than 30 MW aggregate capacity
No fundamental changes.	Generating System: Can apply for exemption if less than 30 MW* capacity.	No fundamental changes. AEMO will not grant an exemption for new generating systems with a total nameplate rating of 30MW or more other than for unscheduled reserve purposes.
Generating systems and integrated resources systems less than 5MW are eligible for an automatic exemption.	Integrated Resource System: can apply for exemption if capacity of all production units^ less than 30 MW,	

⁵ Accessed from the Reliability Panel’s 2021 Annual Market Performance Report (AMPR) which provides observations and commentary on the reliability, security, and safety performance of the power system over the period from 1 July 2020 to 30 June 2021. The final report was published in April 2022.

Less than 5 MW aggregate capacity	Between 5 MW- 30 MW aggregate capacity	Greater than 30 MW aggregate capacity
	AND capacity of BDUs is less than 5 MW*.	

*and annual export less than 20 GWh per annum

^includes generating units and bidirectional units

3.3. Eligibility for Aggregate Dispatch Conformance (ADC)

The Changes to the Guide reflect the changes made to the SO_OP_3705 Dispatch Procedure⁶ (Procedure) to implement ADC in accordance with NER 11.145.16.

3.3.1. Types of ADC

The Procedure states that under NER 11.145.16, a generator with a generating system located behind a connection point that comprises two or more of a scheduled generating unit, semi-scheduled generating unit or scheduled load is permitted to use ADC, excluding any scheduled resource for which AEMO requires individual dispatch conformance (Resource Level Compliance, or RLC).

The two types of ADC are elaborated in the Procedure:

1. Cap aggregate – where the aggregate comprises only semi-scheduled generating units (for example, a generating system comprising a wind and solar semi-scheduled generating unit).
2. Target aggregate – where the aggregate includes one or more scheduled generating units (for example, a battery scheduled generating unit/scheduled load pair plus a solar semi-scheduled generating unit).

Section 2.6.1 of the Procedure provides further detail.

3.3.2. Eligible generating systems and IRS

Between 31 March 2023 and 3 June 2024, eligible generating systems can opt into ADC where:

- they comprise one or more scheduled resources⁷; and
- AEMO gives separate dispatch instructions for each scheduled resource.

From 3 June 2024 onwards, only an IRS can opt into ADC where:

- it comprises one or more scheduled resources; and
- AEMO gives separate dispatch instructions for each scheduled resource.

AEMO is considering a Rule change request to NER 4.9.2A(a) to include generating systems, in addition to integrated resource systems.

⁶ Accessible via AEMO website https://www.aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2022/dispatch-procedure-consultation/soop3705-dispatch-procedure-change-marked-draft.pdf?la=en

⁷ a scheduled GU, a semi-scheduled GU, a scheduled BDU, a scheduled load

3.4. Threshold for an Integrated resource system to participate in central dispatch for scheduling

The NEM's accepted policy has been that generating units 30 MW and above should participate in central dispatch. NER 2.2.2 requires a generating unit with a nameplate rating of 30MW or more, or if part of a group of generating production units connected at a common connection point with a combined nameplate rating of 30 MW or more to be classified as a scheduled generating unit, unless AEMO approves a different classification.

The IESS Rule (as currently written) can be viewed as deviating from the accepted 30 MW policy, in that there are possible aggregate system configurations with a combined capacity greater than 30 MW, that would not result in scheduled or semi-scheduled classifications. However, the risk of this outcome is likely low, given the possible aggregate system configurations with a combined capacity greater than 30 MW that would be unscheduled appear to be limited.

NER 2.2.2(a) provides that a generating unit which has a nameplate rating of 30 MW or more or is part of a group of generating units at the common connection point with a combined rating of 30 MW or more must be classified as a scheduled unit, unless AEMO approves its classification as a semi-scheduled or non-scheduled unit.

NER 2.2.2(a1) provides that a bidirectional unit which has a nameplate rating of 5 MW or more or is part of a group of bidirectional units at the common connection point with a combined rating of 5 MW or more must be classified as a scheduled bidirectional unit, unless AEMO approves it as:

- non-scheduled bidirectional unit;
- scheduled generating unit and scheduled load;
- semi-scheduled generating unit and scheduled bidirectional unit; or
- semi-scheduled generating unit

AEMO has requested the AEMC to undertake a minor amendment to the IESS Rule to replace the references to “generating units” with “production units”, to enable the appropriate classification of a generating unit which is part of a group of production units, including a bidirectional unit, which is connected at a common connection point that has a combined nameplate rating of 30 MW or greater. The Changes to the Guide are in line with this clarification.

Questions

- **What other scenarios can be identified that currently fall outside of this framework?**

3.5. DC-coupled system classification clarifications

AEMO is proposing that to classify a DC-coupled system with multiple VRE sources, AEMO will not facilitate the registration of a DC-coupled wind and solar generating system with one DUID as a semi-scheduled unit. This is because it would require significant changes to the registration system, forecasting systems (Australian Solar Energy Forecasting System, Australian Wind Energy Forecasting System) and Electricity Market Management System (EMMS) integration.

Further, AEMO is proposing to only consider an application for classification of a coupled production unit with a nameplate rating of less than 5 MW as either a scheduled bidirectional unit or a non-scheduled bidirectional unit. Multiple classification requests will not be accepted.

The Guide includes Changes which require, in the case of DC-coupled production units and multiple VRE, the ability for each unit to individually conform by using RLC (though circumstances requiring this would be limited). The Guide specifies that:

- SCADA feeds are required for each DUID for dispatch purposes;
- Mandatory ECM SCADA feeds are required for each semi-scheduled DUID for forecasting purposes;
- The revenue metering occurs at the connection point and is settled as if it were an aggregate and includes non-energy cost recovery; and
- There are the same arrangements for aggregates to apply for ADC.

Questions

- **What other clarifications could be identified that would be appropriate to consider include in the Guide?**

4. Drafting for proposed changes

To help stakeholders respond to this Information Paper, AEMO has also published the change-marked version of the Guide. The change-marked version is available at [AEMO | Current and closed consultations](#).

In summary, AEMO seeks comment and feedback on the key Changes which are proposed to the Guide.

Submissions on these and any other matter relating to the Guide as discussed in this Information Paper are invited by 5pm, Wednesday 21 December 2022.

Appendix A. Abbreviations

Term or acronym	Meaning
AC	Alternating Current
ADC	Aggregate Dispatch Conformance
DC	Direct Current
ECM	Electrical Construction and Maintenance
EMMS	Electricity Market Management System
EPC	Engineering, procurement, and construction
MT PASA	Medium term PASA
MVA	Megavolt ampere
MW	Megawatt
NEL	National Electricity Law
NEM	National Electricity Market
NER	National Electricity Rules
NSP	Network Service Provider
PASA	Projected Assessment of System Adequacy
RLC	Resource Level Compliance
SCADA	Supervisory Control And Data Acquisition
ST PASA	Short term PASA