

NEM Settlement Estimates Policy – IESS and related changes

Draft Report – Standard consultation
for the National Electricity Market

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New South Wales | Queensland | South Australia | Victoria | Australian Capital Territory | Tasmania | Western Australia

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Executive summary and consultation notice

The publication of this draft report commences the second stage of the standard consultation procedure conducted by AEMO (**Consultation**) to consider proposed amendments to the National Electricity Market (**NEM**) Settlement Estimates Policy (**Policy**), to:

- Implement the *National Electricity Amendment (Integrating energy storage systems into the NEM) Rule 2021 (IESS Rule)* by reflecting changes to terms and concepts in the National Electricity Rules (**NER**) under the IESS Rule.
- Improve and simplify the settlement estimations data hierarchies.
- Improve the methodology for determining settlement estimations in the absence of meter data at the TNI level.
- Incorporate market SAPS resource providers (**MSRP**) into the Policy.

This consultation is undertaken as required by NER 3.15.12(c) following the standard rules consultation procedure in NER 8.9.2

The Proposal

IESS rule change terminology update

The IESS Rule updates the regulatory framework to make it easier for energy storage systems and hybrid facilities to register and participate in the NEM. The IESS Rule also presents an opportunity to improve upon the current settlement estimation methodology and structure within the Policy which, in AEMO's view, should provide greater accuracy to estimated settlement data for the benefit of market participants. In light of the IESS rule change, AEMO proposes to update the Policy to replace load and generation terminology with terms reflecting energy quantities.

Improving the settlement estimations data hierarchies

The current Policy applies four hierarchies of available data, in a decreasing order of preference relating to the accuracy of the data source, to determine settlement estimates where no preliminary data is available. Currently, the applicable hierarchy depends on whether the data being estimated is for load or generation, and whether data is being estimated for a market customer, market generator, or demand response service provider (**DRSP**).

To improve readability, reduce confusion and remove unused methodologies, AEMO is proposing to replace the four hierarchies with a single concise hierarchy of data to estimate Consumed Energy or Sent Out Energy for all market participant categories.

Improving settlement estimations in the absence of meter data at the TNI level

Under the current policy, the lowest priority data source in the hierarchy when estimating energy for the previous day at the TNI level relies on applying a scaling factor to an amount of energy based on a like-day, where a like-day is the same day from the most recent billing period for which there is published preliminary data. AEMO has found this estimation method to be fundamentally flawed when applied under the current market conditions with high renewable penetration.

AEMO proposes to replace the scaling factor estimation method with a process that utilises a larger dataset relevant to each participant rather than a single like-day, thereby providing a more finely tuned estimation methodology.

Accounting for MSRPs in the Policy

On 30 May 2023, the *National Electricity Amendment (Regulated stand-alone power systems) Rule 2022 (SAPS Rule)* came into effect to allow distribution network service providers (DNSP) to use stand-alone power systems (SAPS) where it is economically efficient to do so, while maintaining appropriate consumer protections and service standards. The SAPS Rule also created a new registration category, the MSRP, to allow market participants to supply electricity from generating units that are connected to a regulated SAPS. AEMO is proposing to update the Policy to include the MSRP registration category.

Key issues considered

In the consultation paper published on 22 September 2023, AEMO sought feedback on the Proposal. AEMO received no submissions in response to the consultation paper. AEMO's views remain unchanged in regard to the original Proposal, with no substantive issues uncovered since the publication of the consultation paper.

AEMO received queries from two participants and held separate meetings with these participants in October 2023 in accordance with NER 8.9.1(k) to address the queries. The queries related to the following:

- The expected impact to market participants by replacing the regional scaling factor methodology with a multiple linear regression model.

AEMO notes that estimates from the regression model would only apply to two out of the average 30 days of outstandings that make up a participant's prudential position. Furthermore, AEMO's analysis has shown that use of this model will eliminate the flaws arising from the use of the regional scaling factor methodology (as discussed in Section 3.3 of the consultation paper). Examples of such flaws have materialised recently for participants operating in South Australia and such examples were presented during AEMO's Settlement Managers Working Group on 31 October 2023.

- Seeking more detailed information regarding the regression model calculations.

A worked example was provided to the relevant participant which demonstrated the steps and calculations involved with providing an estimated result using this model. This worked example is published with this draft report and AEMO encourages stakeholders who would like to see a demonstration of the worked example to contact AEMO.

AEMO also notes that, negative estimated results produced by the regression model will be zeroed out, see Section 4.

Draft determination

AEMO's draft determination is to implement the Proposal and amend the Policy to reflect the form published with the consultation paper, with a proposed effective date of **3 June 2024**.

Consultation notice

AEMO invites written submissions from interested persons on the draft proposal and issues identified in this draft report to prudentials@aemo.com.au by 5:00 pm (Melbourne time) on **15 December 2023**.

Submissions may make alternative or additional proposals you consider may better meet the objectives of this consultation and the national electricity objective in section 7 of the National Electricity Law. Please include supporting reasons.

Before making a submission, please read and take note of AEMO's consultation submission guidelines, which can be found at <https://aemo.com.au/consultations>. Subject to those guidelines, submissions will be published on AEMO's website.

Please identify any parts of your submission that you wish to remain confidential, and explain why. AEMO may still publish that information if it does not consider it to be confidential, but will consult with you before doing so. Material identified as confidential may be given less weight in the decision-making process than material that is published.

Submissions received after the closing date and time will not be valid, and AEMO is not obliged to consider them. Any late submissions should explain the reason for lateness and the detriment to you if AEMO does not consider your submission.

Interested persons can request a meeting with AEMO to discuss any particularly complex, sensitive or confidential matters relating to the proposal. Please refer to NER 8.9.1(k). Meeting requests must be received by the end of the submission period and include reasons for the request. AEMO will try to accommodate reasonable meeting requests but, where appropriate, we may hold joint meetings with other stakeholders or convene a meeting with a broader industry group. Subject to confidentiality restrictions, AEMO will publish a summary of matters discussed at stakeholder meetings.

Contents

Executive summary and consultation notice	3
1. Stakeholder consultation process	7
2. Background	8
2.1. Context for this consultation	8
2.2. NER requirements	10
2.3. The national electricity objective	10
3. List and discussion of material issues	11
3.1. Changes to reflect the IESS Rule	11
3.2. Improving the estimations data hierarchies	12
3.3. Replacing estimated data based on like-day energy and regional scaling factors with a statistical model	13
3.4. Accounting for MSRPs in the settlement estimations methodology	14
3.5. Proposed effective date	14
4. Other matters	15
5. Draft determination on Proposal	16
5.1. Meeting the objectives of the NEO	16
5.2. Effective date	17
Appendix A. Glossary	18

Tables

Table 1 Consultation process and timeline.....	7
Table 2 List of material issues	11

Figures

Figure 1 Estimated data from regression model.....	15
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1. Stakeholder consultation process

As required by clause 3.15.12(c) of the NER, AEMO is consulting on proposed amendments to the Policy in accordance with the standard rules consultation procedure in NER 8.9.2 (the **proposal**).

Note that this document uses terms defined in the NER, which are intended to have the same meanings. There is a glossary of additional terms and abbreviations in Appendix A.

AEMO's process and expected timeline for this consultation are outlined below. Future dates may be adjusted and additional steps may be included as needed, as the consultation progresses.

Table 1 Consultation process and timeline

Consultation steps	Dates
NEM Wholesale Consultative Forum	15 August 2023
Consultation paper published	22 September 2023
Submissions closed on consultation paper	20 October 2023
Settlement Managers Working Group	31 October 2023
Draft report published	17 November 2023
Submissions due on draft report	15 December 2023
Final report published	22 December 2023

AEMO's consultation webpage for the proposal is at <https://aemo.com.au/consultations/current-and-closed-consultations/nem-settlement-estimates-policy-consultation---iess-and-related-changes>, containing all previous published papers and reports, written submissions, and other consultation documents or reference material.

AEMO's consultation paper on the proposal was published in September 2023, together with the draft amendments to the Policy, and AEMO did not receive any written submissions.

AEMO also met separately with individual stakeholders on 4 October 2023 and 26 October 2023 to discuss some specific questions raised. AEMO has also responded to those questions in this draft report.

AEMO thanks all stakeholders for their feedback on the proposal to date, which has been considered in preparing this draft report, and looks forward to further constructive engagement.

2. Background

2.1. Context for this consultation

In December 2021, the AEMC made the *National Electricity Amendment (Integrating energy storage systems into the NEM) Rule 2021 (IESS Rule)*. The IESS Rule updates the regulatory framework to recognise energy storage systems and hybrid facilities in the NER (as ‘bidirectional units’ and ‘integrated resource systems’) and make it easier for operators of those facilities to register and participate in the NEM. The majority of NER changes introduced by the IESS Rule will come into effect on 3 June 2024. The IESS Rule introduced a transitional provision which requires AEMO to review, and where it considers it necessary or desirable, amend and publish, procedures to take into account the IESS Rule (NER 11.145.9).

The concepts and associated terminology introduced by the IESS Rule will necessitate corresponding terminology updates to the Policy. At the same time, AEMO has taken the opportunity to consider changes that can be made to the Policy for:

- Improving and simplifying the estimations data hierarchies.
- Improving the methodology for determining settlement estimations in the absence of meter data at the TNI level.
- Incorporating MSRPs into the Policy.

2.1.1. Settlement estimations

AEMO monitors the daily prudential position of each market participant in the NEM through their outstandings, which is a key value used in their prudential assessment. This ensures that AEMO holds enough credit support to cover the liabilities of market participants and minimise credit risk to the NEM as a whole. Under clause 3.3.9 of the NER, AEMO is required to determine the outstandings of a market participant as a dollar amount, and under clause 3.3.11 of the NER, AEMO may take certain actions, including issuing a call notice to the market participant, if a market participant fails to maintain their outstandings below their trading limit.

Under clause 3.3.9 of the NER, the amounts used in the calculation of a market participant’s outstandings are the actual settlement amounts for billing periods where final statements have been issued by AEMO or AEMO’s reasonable estimate of the settlement amounts for billing periods (where final statements have not been issued).

In practice, AEMO uses preliminary billing runs in the assessment of a market participant’s outstandings where these are available. For days where no preliminary billing run has been performed, a settlement estimation process is used.

2.1.2. IESS rule change

The IESS Rule will make a number of NER changes including:

- A new registration category, the Integrated Resource Provider (**IRP**), that allows storage and hybrids to register and participate in a single registration category rather than under two different categories.
- New classification categories for energy producing and consuming facilities, including bidirectional units, integrated resource systems and ancillary service units.
- Clarity for the scheduling obligations that apply to different configurations of hybrid systems, including DC-coupled systems, so that operators of these systems have the flexibility to choose whether to be scheduled or semi-scheduled.
- Allowing hybrid systems to manage their own energy behind the connection point, subject to system security limitations.
- Clarifying that the current approach to performance standards that are set and measured at the connection point will apply to grid-scale storage units, including when part of a hybrid system.
- Transferring existing small generation aggregators to the new IRP category, with new aggregators of small generating units and/or storage units also registering in this category.
- Aggregators registered in the IRP category will be able to provide market ancillary services from generation and load.
- Amending the framework to recover non-energy costs based on a market participant's net Consumed and Sent Out Energy at each market connection point over relevant intervals, irrespective of its registration category.

The proposal aims to ensure that the Policy will reflect all relevant changes from the IESS Rule. Further context on this aspect of the proposal is provided in Section 3.1.

2.1.3. SAPS rule change

The falling costs of renewable generation and batteries are leading to significant decreases in the costs of providing off-grid electricity supply¹. In some areas, including those prone to bushfire risk or that are heavily vegetated, off-grid supply may now be less costly than standard supply. The SAPS Rule allows DNSPs to use SAPS where it is economically efficient to do so, while maintaining appropriate consumer protections and service standards.

As the level of MSRP participation in the NEM is expected to increase, the proposal includes an MSRP settlement estimation methodology in the Policy. Further context on this aspect of the proposal is provided in Section 3.4.

¹ AEMC, May 2020. "Updating the regulatory frameworks for distributor-led stand-alone power systems". At <https://www.aemc.gov.au/market-reviews-advice/updates-regulatory-frameworks-distributor-led-stand-alone-power-systems>. Viewed: 18 October 2023.

2.2. NER requirements

The Policy is made under NER 3.15.12(c) and describes the principles and processes which AEMO applies when calculating *estimated settlement amounts* for the purposes of NER 3.15.12(b). AEMO also applies these principles and processes when estimating settlement amounts for billing periods under NER 3.3.9.

2.3. The national electricity objective

Within the specific requirements of the NER applicable to this proposal, AEMO will seek to make a determination that is consistent with the national electricity objective (NEO) and, where considering options, to select the one best aligned with the NEO.

The NEO is expressed in section 7 of the National Electricity Law as:

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; and
- (c) the achievement of targets set by a participating jurisdiction—
 - (i) for reducing Australia’s greenhouse gas emissions; or
 - (ii) that are likely to contribute to reducing Australia’s greenhouse gas emissions.

AEMO has determined not to apply the amended NEO to this consultation process, see Section 5 for more details.

3. List and discussion of material issues

The key material issues arising from the proposal or raised in submissions or consultation meetings are listed in the following table:

Table 2 List of material issues

No.	Issue	Raised by
1.	Changes to reflect the IESS Rule	AEMO
2.	Improving the estimations data hierarchies	AEMO
3.	Replacing estimated data based on like-day energy and regional scaling factors with a statistical model	AEMO
4.	Accounting for MSRPs in the settlement estimations methodology	AEMO

Each of the material issues in Table 2 is discussed below.

3.1. Changes to reflect the IESS Rule

3.1.1. Issue summary and submissions

AEMO has identified necessary changes to the Policy directly arising from the NER amendments made by the IESS Rule. These changes are administrative only (i.e. replacing existing terms with corresponding newly defined terms), and do not change the way settlement estimations are calculated under the Policy. No submissions commented on this issue.

3.1.2. AEMO's assessment

AEMO proposes that the terminology in the Policy should be updated to reflect and give effect to the IESS Rule, consistent with AEMO's obligation under NER 11.145.9. The most significant changes will be to, where appropriate, replace load and generation terminology with terms reflecting energy quantities.

These changes reflect the updates that will be made in AEMO's systems. They will promote consistency with the NER, enhancing clarity and certainty of interpretation, which aligns with the NEO.

3.1.3. AEMO's conclusion

The Policy should be amended to reflect the terminology changes arising from the IESS Rule.

3.2. Improving the estimations data hierarchies

3.2.1. Issue summary and submissions

The current Policy outlines the process for determining settlement estimates for market participants in the NEM. Under this process, the methodology for determining settlement estimations is based on specific hierarchies of available data in a decreasing order of preference relating to the accuracy of the data source, when no preliminary data is available. These hierarchies split energy estimates into four broad categories:

- Generation for market generators,
- Load for market generators,
- Load for market customers, and
- Wholesale demand response settlement quantity for DRSPs.

These hierarchies only cater for four specific participant categories and present the data sources in a repetitive way, thus creating confusion for market participants especially those registered in other categories. The Policy also contains data sources and estimation methodologies that add insufficient value to the estimation process. No submissions commented on this issue.

3.2.2. AEMO's assessment

AEMO proposes to make a number of changes to be made to the Policy, including:

- Using a single hierarchy which covers all market participants,
- Using the latest metering data available as the first priority data source, regardless of quality,
- Replacing the use of generation static regional scaling factors with the appropriate DLF at the relevant TNI; and
- Removing estimations based on like-day energy and scaling factors.

These proposed changes will:

- Streamline and simplify the data hierarchy for all market participant categories; and
- Remove the confusion currently arising from repetitive and ineffective steps in the hierarchies in the current Policy, improve clarity, and ultimately provide more accurate estimations.

3.2.3. AEMO's conclusion

The Policy should be amended to include the changes listed above to allow for a more streamlined and simplified data hierarchy, resulting in more accurate estimations, and improved clarity. By enhancing clarity and certainty of interpretation, implementation of the changes will align with the NEO.

3.3. Replacing estimated data based on like-day energy and regional scaling factors with a statistical model

3.3.1. Issue summary and submissions

The data hierarchies in the current Policy provide a process for estimating settlement amounts when preliminary data is unavailable. Within these data hierarchies the higher priority data sources are available meter data and SCADA, which are known to provide sufficiently accurate estimates. The lowest priority of estimation, which is based on like-day energy and a regional scaling factor, has proven to be problematic and fundamentally incorrect in certain circumstances, with such cases having become more common over time. This correlates to a steady decrease in estimations accuracy over the years since the implementation of this methodology in 2013.

This lowest priority estimation applies only to situations where the meter data is expected at the TNI level, also known as aggregated reads, and only applies to two out of the average 30 days of outstandings.

Nowadays, in any given trading interval, the ratio of like-day energy and estimated day energy in a region no longer correlates to changes to a participant's Consumed Energy or Sent Out Energy. Therefore, applying such a ratio produces estimations that have abnormal deviations from the true energy values.

AEMO proposes to make the following changes to the Policy:

- Replace the regional scaling factor estimation method with a multiple linear regression model when estimating in the absence of meter data at the TNI level.
- Replace the data source for participant energy from settlement values to meter data values. This change also removes the dependency on the SETCPDATA table which will no longer be populated after IESS project go live.

No submissions commented on this issue. However stakeholders:

- queried whether replacing the regional scaling factor methodology with a multiple regression model would have a material impact on market participants, and
- requested more detailed information regarding the regression model calculations.

3.3.2. AEMO's assessment

The regression model that is proposed to replace the regional scaling factor methodology will only be used when there is no meter data available. This is typically the case for the most recent two days of the 4 to 5 week Outstandings period. Under normal circumstances, after three days a billing run for an INITIAL meter data case will replace any value calculated using the regression model.

In response to the second stakeholder query, AEMO met with the stakeholder and presented a worked example of the regression model. The worked example demonstrated the steps and calculations required to produce an estimation using the regression model. This worked example is published alongside this draft report. Participants seeking a demonstration of this worked example or who wish to discuss this further, can do so by e-mailing prudentials@aemo.com.au.

The proposed changes will impact market participants with meter data that is aggregated at the TNI level, and will eliminate the flaws arising from the use of the regional scaling factor methodology. Unlike the regional scaling factor methodology, the regression model will be performed at a greater granularity for each market participant based on their behaviour. This will result in more accurate estimations of settlement data and will help reduce market participant prudential risk. For market participants with meter data that is aggregated to the TNI level, the changes will lessen the risks of trading margin under or over estimation and their associated financial impacts.

3.3.3. AEMO's conclusion

The Policy should be amended to replace the regional scaling factor methodology with a multiple linear regression model. By reducing participant risk and the financial impacts arising from inaccurate trading margin estimations, these changes will align with the NEO.

3.4. Accounting for MSRPs in the settlement estimations methodology

3.4.1. Issue summary and submissions

Currently the Policy does not consider MSRPs. With the SAPS Rule coming into effect on 30 May 2023, AEMO is expecting that more SAPS will be registered in the NEM and is updating its relevant guides and procedures to accommodate this change. No submissions commented on this issue.

3.4.2. AEMO's assessment

AEMO proposes to apply the current practice for estimating Consumed Energy and Sent Out Energy in a Regulated SAPS to MSRPs, that is, the latest metering data available regardless of quality is used, otherwise an estimate of zero is used. This will help promote efficient investment in, and efficient operation and use of, electrical services for the long term interests of consumers of electricity.

3.4.3. AEMO's conclusion

The Policy should be amended to apply the current practice for estimating Consumed Energy and Sent Out Energy in a Regulated SAPS to MSRPs.

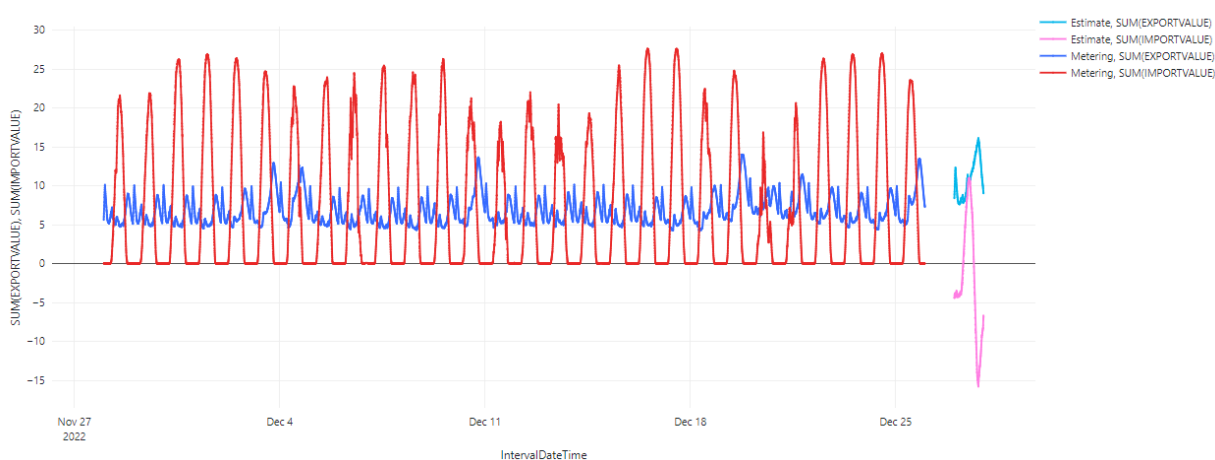
3.5. Proposed effective date

The proposed effective date for all amendments to the Policy considered in the proposal is 3 June 2024, when the IESS Rule comes into effect.

4. Other matters

In addition to section 3.3.3 of the consultation paper, it's important to note that any negative estimated results produced by the regression model will be zeroed out. Figure 1 below represents a market participant at a given TNI, NMI classification, and meter type with Sent Out Energy or imports shown as the red line, and Consumed Energy or exports shown as the darker blue line. The darker blue and red lines represent in general what a retailer with customers with solar PV would have as an input to the regression model. For this case, the regression model may produce a negative estimated result as shown in the pink line below. AEMO considers that this estimate should be zeroed out to prevent additional consumption charges. No submissions commented on this matter.

Figure 1 Estimated data from regression model



5. Draft determination on Proposal

Having considered all relevant matters, AEMO's draft determination is to amend the Policy in the form published with the first round consultation paper.

Implementation of the Proposal by amending the Policy in this way, will meet the objectives of the NEM Settlement Estimates Policy as set out in NER 3.15.12(c) by:

- Promoting consistency with the NER, enhancing clarity and certainty of interpretation;
- Removing confusion arising from repetitive and ineffective steps of the hierarchies in the current Policy;
- Reducing participant risk and financial impacts from trading margin underestimation and overestimation for market participants with meter data that is aggregated to the TNI level.

5.1. Meeting the objectives of the NEO

By simplifying estimation hierarchies to apply to all market participants and replacing inadequate and flawed estimation methodologies with more granular, participant specific estimation methods, the proposed changes will simplify and clarify the settlement estimation process. Implementation of the Proposal will also reduce participant risk and the financial impacts arising from abnormal and inaccurate trading margin estimations. These outcomes meet the objectives of the NEO by promoting the efficient operation of electricity services for the long-term interests of consumers by reducing the costs and risks of current prudential estimation methods for market participants in the NEM.

The *Statutes Amendment (National Energy Laws) (Emissions Reduction Objectives) Act 2023 (SA) (Amending Act)* recently amended the NEL to incorporate a new emissions reduction element into the NEO. AEMO is not required to apply the amended NEO to a process which has started but will not be completed until 21 November 2023, but it has a discretion to do so. This consultation process is such a process.

AEMO has determined that the amended NEO should not apply to this consultation process because the application of the amended NEO will not make a material difference to AEMO's final determination. This is because:

- the principles of the NEM settlement estimates policy set out in NER 3.15.12(c) do not allow for consideration of the achievement of emissions reduction targets and there is no other requirement or basis for AEMO to consider the new emissions reduction element in the NEO in making its prudential decisions,
- the amendments to the Policy will have no influence on the level of Australia's greenhouse gas emissions or on related emissions targets, and so consideration of emissions reduction or related targets will not be relevant to the Policy or this consultation process, and
- actions taken under the Policy fall within the real time systems and operations functions performed by AEMO which are not intended to be affected by the new emissions objective².

² Second Reading Speech, Statutes Amendment (National Energy Laws) (Emissions Reduction Objectives) Bill 2023, Hansard, South Australian House of Assembly, Wednesday June 14, 2023 (The Hon A Koutsankounis).

5.2. Effective date

AEMO's proposed effective date for the determination is 3 June 2024, when the IESS Rule comes into effect.

Appendix A. Glossary

Term or acronym	Meaning
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
Aggregated reads	Consumed Energy and Sent Out Energy aggregated to a TNI level
Consumed Energy	For a market connection point for a trading interval is calculated as follows: $ME- \times DLF$
DLF	The distribution loss factor applicable at the market connection point
DNSP	Distribution Network Service Provider
DRSP	Demand Response Service Provider
Individual reads	Consumed Energy and Sent Out Energy at a NMI level
IRP	Integrated Resource Provider
ME-	For a market connection point for a trading interval, the amount of electrical energy estimated in accordance with paragraph 3.2.1 of the Policy, expressed as a negative value in MWh, flowing at the connection point in the trading interval, where the flow is away from the transmission network connection point to which the connection point is assigned.
ME+	For a market connection point for a trading interval, the amount of electrical energy estimated in accordance with paragraph 3.2.1 of the Policy, expressed as a positive value in MWh, flowing at the connection point in the trading interval, where the flow is towards the transmission network connection point to which the connection point is assigned.
MSRP	Market SAPS Resource Provider
NEM	National Electricity Market
NER	National Electricity Rules
NMI	National Metering Identifier
Policy	The NEM Settlement Estimates Policy
SAPS	Stand-alone power system
SCADA	Supervisory Control and Data Acquisition
Sent Out Energy	For a market connection point for a trading interval is calculated as follows: $ME+ \times DLF$
TNI	Transmission Node Identifier