



National Electricity Market Settlement Estimates Policy

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Current version release details

Version	Effective date	Summary of changes
3.04.0	1 October 2021 ³ June 2024	<ul style="list-style-type: none"> • Add provisions for estimating settlement results for the purpose of prudential estimation for Demand Response Service Providers under the Wholesale Demand Response Mechanism. • Update SMS start date. • New AEMO template. • Replaced the five separate data hierarchies in Section 3 with one main hierarchy. • Incorporated Market SAPS Resource Providers into the methodology for determining settlement estimations. • Amendment to the methodology for determining settlement estimates for previous day energy at a TNI level when no meter data is available. • Minor drafting improvements.

Note: There is a full version history at the end of this document.

1. Introduction

1.1. Purpose and scope

This is the NEM Settlement Estimates Policy made under clause 3.15.12(c) of the National Electricity Rules (**NER**) (**Procedures**).

These Procedures have effect only for the purposes set out in the NER. The National Electricity Law and the NER prevail over these Procedures to the extent of any inconsistency.

These Procedures set out:

1. the principles and process for calculating *estimated settlement amounts* when normal processing is not possible—;
2. AEMO's process for estimating settlement amounts for the purpose of prudential estimation under ~~Rule 3.3.9~~ [clause 3.3.9 of the NER](#).

1.2. Definitions and interpretation

1.2.1. Glossary

Terms defined in the National Electricity Law and the NER have the same meanings in these Procedures unless otherwise specified in this clause.

Terms defined in the NER are intended to be identified in these Procedures by italicising them, but failure to italicise a defined term does not affect its meaning.

In addition, the words, phrases and abbreviations in the table below have the meanings set out opposite them when used in these Procedures.

Term	Definition
Consumed Energy	For a market connection point for a trading interval is calculated as follows: ME- × DLF
DLF	The distribution loss factor applicable at the market connection point
DRSP	Demand Response Service Provider
EMS	Energy Management System
EMMS	Electricity Market Management System
MDP	<i>Metering Data Provider</i>
MDM	Meter Data Management
ME-	For a market connection point for a trading interval, the amount of electrical energy estimated in accordance with paragraph 3.2.1 of this Procedure, 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 this Procedure, 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.
MSATS	Market Settlement and Transfer Solution
MSRP	Market SAPS Resource Provider
NER	National Electricity Rules

Term	Definition
NMI	National Metering Identifier
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+ × DLF
TNI	Transmission Node Identifier
TNISF	Wholesale Connection Point Scaling Factor
UFE	Unaccounted for energy

1.2.2. Interpretation

These Procedures are subject to the principles of interpretation set out in Schedule 2 of the National Electricity Law.

1.3. Related documents

Title	Description and location
Market Suspension and System Failure Procedure	Explains how AEMO manages situations where market systems fail, or which may require suspension of the <i>spot market</i> . https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_3706-failure-of-market-or-market-systems.pdf http://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Power_System_Ops/Procedures/SO_OP_3706---Failure-of-Market-or-Market-Systems.pdf
Service Level Procedure: Metering Data Provision Provider Services	Sets out MDP's obligations in relation to system architecture and administration. https://aemo.com.au/-/media/files/electricity/nem/retail_and_metering/metering-procedures/2023/service-level-procedure-mdp-services.pdf https://www.aemo.com.au/-/media/files/electricity/nem/retail_and_metering/metering-procedures/2020/service-level-procedure-mdp-services-v18.pdf?la=en&hash=2F2D052F6C186004DF31D3D9D643B008
Metrology Procedure Part B: Metering Data Validation, Substitution and Estimation	Sets out the procedure for metering data validation, substitution and estimation for MDP. https://aemo.com.au/-/media/files/electricity/nem/retail_and_metering/market_settlement_and_transfer_solutions/metrology-procedure-part-b-v75-clean-new-template.pdf http://aemo.com.au/-/media/Files/Electricity/NEM/Retail_and_Metering/Load_Tables/Metrology_Procedure_Part_B_v60.pdf
MSATS Procedure: MDM Procedures	Sets out AEMO obligations with regards to preparation of <i>settlements</i> ready data to facilitate the issue of <i>settlement statements</i> . https://aemo.com.au/-/media/files/electricity/nem/retail_and_metering/market_settlement_and_transfer_solutions/2023/msats-procedures--mdm-procedure-v44-clean-new-template-rm46.pdf http://aemo.com.au/-/media/Files/Electricity/NEM/Retail_and_Metering/Market_Settlement_And_Transfer_Solutions/2017/MSATS_Procedures_MDM_Procedure_V33.pdf

2. Settlement process during system and communications failures

AEMO has developed IT systems and databases, business processes and Procedures to manage the risks of a range of system or communications outage incidents impacting normal settlement processes.

In all scenarios other than a *market suspension*, AEMO can produce *preliminary and final settlement statements* without the need to calculate *estimated settlement amounts*.

2.1. Failure of EMMS

Services will be transferred to another back-up server on the same site or a back-up server on an alternative site in accordance with clause ~~3~~2 of the Market Suspension and System Failure Procedure.

If AEMO is unable to operate the *spot market* due to EMMS failures AEMO ~~will~~may suspend the NEM in accordance with the Market Suspension and System Failure Procedure.

2.2. Failure of Communications Impacting the Delivery of Metering Data

Clause 6 of the Service Level Procedure: Metering Data ~~Provision-Provider~~ Services sets out an MDP's' obligations in relation to system architecture and administration. -If a system failure occurs the MDP must ensure that its *metering data* services database is restored to operational service within the required timeframe in accordance with clause 6.3.5 of the above Procedure.

Clause 7.10.2 of the NER sets out each MDP's' obligations in relation to *metering data* management and storage. -If an MDP's *metering data* fails to meet the required validation rules prescribed in Metrology Procedure Part B: Metering Data Validation, Substitution and Estimation AEMO will estimate and substitute the affected data in accordance with clause 7.11.2(c) of the NER and the MSATS Procedure: MDM Procedures.

2.3. Failure of MSATS

Services will be transferred to another back-up server on the same site or a back-up server on an alternative site.

2.4. Failure of EMMS and MSATS supporting databases

The relevant services will be transferred to another back-up server on the same site or a back-up server on an alternative site.

3. Settlement estimates for the purpose of prudential assessments

Under clause 3.3.9 of the NER, AEMO is required to determine the *outstandings* of a *Market Participant* as a dollar amount. The *outstandings* is a key value used in the prudential assessment of a *Market Participant*. 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. ~~Market Participants are obliged under clause 3.3.11 of the NER to maintain their *outstandings* below their trading limit. Failure to do so can result in AEMO issuing a call notice.~~

The value of a *Market Participant's outstandings* can be considered to be the aggregate of the absolute value of net settlement amounts payable in respect of any *billing period*, or part of a *billing period*, that has occurred but not yet been settled less security deposit funds held by AEMO in respect of the *Market Participant*.

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 required. The process followed by AEMO to estimate settlements data for the purposes of prudential assessment is described below.

3.1. UFE for Global Settlements

Where initial *metering data* and/or preliminary and final settlement data is available, AEMO will include the *Market Participant's* allocation of UFE in the settlement estimation for prudential purposes. Where no *metering data* is available, the UFE component will be assumed to be zero.

3.2. Settlement estimation process

The following is a hierarchy of available data which is to be applied for the purposes of determining settlement estimates where no preliminary billing run data is available. AEMO will develop and implement ~~a set of data quality, Market Participant~~ and wholesale *connection point* data parameters and validations to determine the highest level in the hierarchy ~~that is of sufficient quality~~ to be applied in the estimation of *settlement amounts*.

~~Energy data can be split into four broad categories for the purposes of settlements estimation. These are generation for Market Generators, load for Market Generators, load for Market Customers and wholesale demand response settlement quantity for Demand Response Service Providers.~~

~~For each of these categories the s~~ Settlement estimates are to be based on the following data sources in a decreasing order of preference relating to the accuracy of the data source.

3.2.1. Hierarchy of data for estimating Consumed Energy and Sent Out Energy for all market participant categories

(a) Available metering data

- A billing run is to be performed for each calendar day which will pick up the latest metering data available for all days for which there is yet to be a preliminary billing run.

(i) If the meter data is provided at the NMI level:

(A) SCADA data

- Sent Out Energy and Consumed Energy is estimated directly from the NEM dispatch process. SCADA data is used for scheduled generating units, semi-scheduled generating units, non-scheduled generating units, scheduled bidirectional units, and non-scheduled bidirectional units that have SCADA data available.

(ii) If the meter data is provided at the TNI level:

(A) TNI SCADA data

- For Sent Out Energy and Consumed Energy, if there is a single Market Participant at the TNI then the SCADA data can be utilised where a one-to-one (SCADA to connection point) mapping is available. Market Participants can request AEMO to consider their suitability for using TNI SCADA data.

(B) Estimated data based on a statistical model

- To estimate the settlement amounts for the previous day's energy, a multiple linear regression model using period ID, region demand, business day vs non-business day, and the date being predicted as predictor values, is applied over the latest 28 days of available meter data for the Market Participant.
- The coefficients for regression are calculated based on Sent Out Energy and Consumed Energy for each Market Participant.

(b) Zero estimate

- For estimating wholesale demand response settlement quantity for DRSPs, the wholesale demand response settlement quantity is estimated at zero when actual metering data or final substitution metering data are not available.
- For MSRPs, the Consumed Energy and Sent Out Energy is estimated at zero when actual metering data or final substitution metering data are not available.

~~3.2.1. Hierarchy of Data for Estimating Generation for Market Generators~~

~~— Actual metering data~~

~~A billing run is to be performed for each calendar day which will pick up the latest metering data available for all days for which there is yet to be a preliminary billing run.~~

~~— SCADA data~~

~~Generation is estimated directly from the NEM dispatch process with application of a static regional scaling factor to correct SCADA data for differences in point of measurement to metering data. SCADA data is used for scheduled generating units and semi-scheduled generating units, and non-scheduled generating units that have data available.~~

~~AEMO will review the static regional scaling factors annually, publishing them on the AEMO website and notifying Market Participants when the factors are changed.~~

~~3.2.2. Hierarchy of data for estimating load for Market Generators~~

~~(a) Actual metering data~~

~~—A billing run is to be performed each calendar day which will pick up the latest metering data available for all days for which there is yet to be a preliminary billing run.~~

~~(b) Estimated data based on like-day energy~~

~~—Load is estimated by scaling energy from a like-day for which actual metering data is available and applying a scaling factor derived from regional dispatch data.~~

~~3.2.3. Hierarchy of data for estimating load for Market Customers~~

~~(a) Actual metering data~~

~~—A billing run is to be performed each calendar day which will pick up the latest metering data available for all days for which there is yet to be a preliminary billing run.~~

~~(b) TNI SCADA data~~

~~—If there is a single Market Participant consuming energy at the TNI then the SCADA data can be utilised where a one-to-one (SCADA to connection point) mapping is available. Market Participants can request AEMO to consider their suitability for using TNI data.~~

~~(c) Estimated data generated for each NMI by the MDP in accordance with the Metrology Procedure Part B: Metering Data Validation, Substitution and Estimation.~~

~~(d) Estimated data generated for each NMI by MSATS in accordance with the MSATS Procedure: MDM Procedures.~~

~~(e) Estimated data based on like-day energy and wholesale connection point scaling factors (TNISFs)~~

~~—To estimate the previous day energy, a wholesale connection point scaling factor (TNISF) is applied to the like-day data for the Market Participant. The TNISF is calculated for each trading interval based on net energy purchase at the connection point and represented by the following equation:~~

$$TNISF = \frac{\text{Wholesale EMS Energy Previous day}}{\text{Wholesale EMS Energy Like day}}$$

~~—This estimation relies on a sufficient mapping between the wholesale connection points and the SCADA data in EMS.~~

~~(f) Estimated data based on like-day energy and regional scaling factors with a Market Participant specific calculation refinement.~~

~~—The like-day f minute regional scaling factor (SF) applied to the like-day data for the Market Participant (described in 7 below) can be refined using linear regression as illustrated below.~~

$$\text{Market Participant SF} = [\text{Regional Scaling Factor} \times \alpha] + \beta$$

~~(g) Estimated data based on like-day energy and regional scaling factors~~

~~—To estimate the previous-day energy, a five-minute regional scaling factor (SF) is applied to the like-day data for the Market Participant. The SF is calculated based on the regional dispatch data and is represented by the equation below:~~

$$\text{Regional Scaling Factor} = \frac{\text{Regional Dispatch Previous-day}}{\text{Regional Dispatch Likeday}}$$

~~In the above hierarchy, a like-day is the same day from the most recent billing period for which data from a preliminary billing run is available.~~

~~3.2.4. Hierarchy of data for estimating wholesale demand response settlement quantity for Demand Response Service Providers~~

~~(a) Actual metering data~~

~~—A billing run is to be performed each calendar day which will pick up the latest metering data available for all days for which there is yet to be a preliminary billing run.~~

~~—The wholesale demand response settlement quantity is calculated using the actual metering data in accordance with NER clause 3.15.6B(c).~~

~~(b) Final substituted metering data~~

~~—Substituted metering data is generated for each NMI by the MDP in accordance with the Metrology Procedure Part B: Metering Data Validation, Substitution and Estimation. Only metering data designated as final substituted metering data can be used.~~

~~—The wholesale demand response settlement quantity is calculated using the final substituted metering data in accordance with NER clause 3.15.6B(c).~~

~~(c) Estimated data~~

~~—The wholesale demand response settlement quantity is estimated at zero when actual metering data or final substitution metering data are not available.~~

Version release history

Version	Effective date	Summary of Changes
4.0	3 June 2024	<ul style="list-style-type: none"> • New AEMO template. • Replaced the five separate data hierarchies in Section 3 with one main hierarchy. • Incorporated Market SAPS Providers into the methodology for determining settlement estimations. • Amendment to the methodology for determining settlement estimates for previous day energy at a TNI level when no meter data is available. • Minor drafting improvements.
3.0	1 October 2021	<ul style="list-style-type: none"> • Add provisions for estimating settlement results for the purpose of prudential estimation for Demand Response Service Providers under the Wholesale Demand Response Mechanism. • Update 5MS start date.
2.0	1 July 2021	<ul style="list-style-type: none"> • Re-arranged information to comply with AEMOs new external Procedure template. • Replaced Section 5 in version 1.1 with Section 2 in the current version. • Updated references to half-hourly or thirty-minute to five-minute (<i>trading interval</i>). • Updated to include UFE estimations for prudential purposes in Section 3.1.
1.1	13 Mar 2013	Minor amendments to NEM Settlement Estimates Policy to include effective date of 15 March 2013.
1.0	10 Aug 2012	Initial Version of NEM Settlement Estimates Policy. With effect from the Effective Date determined under clause 1, this Policy and the NEM Settlement Revisions Policy supersede the NEM Settlement Estimates and Revisions Policy version 3A, published on 15 November 2009.