WEM Settlement Statement and Invoice Technical Guide

Version 3.0

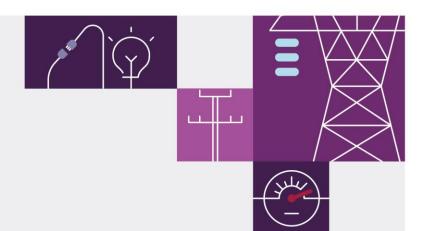Applicable from Trading Day 20 November 2024

Important notice

Purpose

The Australian Energy Market Operator (AEMO) has prepared this document to provide information about the Wholesale Electricity Market Settlement Statements and Invoices as at the date of publication.

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Version control

Version	Release date	Changes
1.0	25/8/2021	Initial publication
2.0	17/11/2023	Updated for WEM Rules effective 1 October 2023 (WEM Reform)
3.0	07/03/2025	Updated for WEM Amendment (FCESS Cost Review) Rules 2024 effective 20 November 2024

Document approval

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1. Introduction

1.1 Purpose

This document is the WEM Settlement Statement and Invoice Technical Guide.

This document provides general information about the formats of the Settlement Statements, adjusted Settlement Statements, and Invoices produced by AEMO's systems in accordance with the WEM Rules.

1.2 Application

This document applies to:

- AEMO who is required to issue Settlement Statement and Invoices to Rule Participants; and

- Rule Participants who are required to pay amounts owing on Invoices, or who are to receive amounts owing on Invoices.

All references to rules and procedures relate to the Wholesale Electricity Market.

> This document is effective for all Settlement Statements and Invoices issued for Trading Weeks containing Trading Days from 20 November 2024.

1.3 Supporting documentation

This guide should be read in conjunction with the following documents:

- WEM Metering, Settlement and Prudential Calculations from Version 5.0
- WEM Procedure: Settlement effective from 1 October 2023
- Prudential and Settlements Service User Guide from Version 1

1.4 Terms and abbreviations

The terms and abbreviations used in this document are outlined in Table 2.

Table 1   Terms and abbreviations

Term or abbreviation	Definition or expanded name
AEMO	Australian Energy Market Operator
API	Application Programming Interface
Formulation	Means the WEM Metering, Settlement and Prudential Calculations document
MPI	Market Participant Interface
PaSS	Prudential and Settlement Service

Term or abbreviation	Definition or expanded name
Post-Amended Rules	Means the WEM Rules as in force immediately after the New WEM Commencement Day [WEM Rule 1.47.1]
Pre-Amended Rules	Means the WEM Rules as in force immediately before the New WEM Commencement Day [WEM Rule 1.47.1]
WEM	Wholesale Electricity Market
WEMS	Wholesale Electricity Market System

1.5 Further information

Please contact WA Prudentials and Settlements on wa.settlements@aemo.com.au for further information regarding the materials contained in this document.

2 Calculation Formulation

2.1 Overview

The WEM PaSS application is built on the basis of the independently certified **WEM Metering, Settlement and Prudential Calculation** document (the "Formulation"). This document creates a mathematically accurate representation of the WEM Rules, including:

- Representation of sets for use within the document;

- Mathematical equation representation of the WEM Rules;

- Specifications for variables used by the calculations;

- Trading Margin calculation for Participants on a given Trading Day;

- Settlement of the relevant market services;

- Interest calculation for the Adjustment Process; and

- Input estimation methodology for Prudential calculations.

This Formulation is the foundation for the prudential and settlement calculations implemented in AEMO's software.

The outputs of the calculations are provided to Rule Participants through the Settlement Statement and Invoice artefacts.

2.2 Version

AEMO publishes the Formulation as a PDF file and as a text file.

The latest version(s) of the Formulation can be found under settlement technical guides on the AEMO Website.

More than one version may be current due to the applicable Trading Days and the Adjustment Process.

2.3 Variable Scope

The scope component of a variable describes the object to which each variable relates. The following table describes the scopes and formats provided in the Settlement Statement and Invoice artefacts.

Table 2   Variable scope formats

Scope	Name	Description	Format and Example	Relevant Artefact(s)
A	Capacity Credit Allocation	The id of the Capacity Credit Allocation Submission.	Examples: 800, 5050, 10123	Detail
C	Contract	A string that uniquely identifies the Contract.	Example: NCESS001	Detail
CH	Channel	A string that uniquely identifies a channel of metering data for a NMI.	Format: <N>-<TYPE><INTEGER> where	N/A

Scope	Name	Description	Format and Example	Relevant Artefact(s)
			• N is the same as scope N • TYPE is B for generation or E for consumption Examples: 1234567890-E1, 1234567890-B2	
T	Tranche	A string that uniquely identifies a Capacity Credit tranche for a Facility or a Market Participant. Relates to the following variables: • CCP_T_D • CCQ_T_D, CCCQ_T_D • TRCCrank_T_D	Facility: <F>|F Participant: <P>|P where • <F> is the same as scope F • <P> is the same as scope P Examples: GRASMERE_WF1|F, WPGENER|P	Detail
T	Tranche	A string that uniquely identifies an Offer tranche for a Facility and a Market Service. Relates to the following variables: • RTMOERank_T_DI, RTMOCRRank_T_DI, RTMOCLRank_T_DI, RTMORRRank_T_DI, RTMORLRank_T_DI • RTEDC_T_DI, CRDC_T_DI, CLDC_T_DI, RRDC_T_DI, RLDC_T_DI • RTEQTop_T_DI, CRQTop_T_DI, CLQTop_T_DI, RRQTop_T_DI, RLQTop_T_DI, RLQBtm_T_DI • RTEQBtm_T_DI, CRQBtm_T_DI, CLQBtm_T_DI, RRQBtm_T_DI, • CLP_T_DI, CRP_T_DI, RLP_T_DI, RRP_T_DI, RTEP_T_DI • CLQ_T_DI, CRQ_T_DI, RLQ_T_DI, RRQ_T_DI, RTEQ_T_DI	Real-Time Energy: <F>|E_T1 to <F>|E_T10 Contingency Reserve Raise: <F>|CR_T1 to <F>|CR_T10 Contingency Reserve Lower: <F>|CL_T1 to <F>|CL_T10 Regulation Raise: <F>|RR_T1 to <F>|RR_T10 Regulation Lower: <F>|RL_T1 to <F>|RL_T10 where • <F> is the same as scope F • T1 represents the first tranche • T10 represents the tenth tranche (maximum permitted) Examples: KWINANA_ESR1|CL_T1, MUJA_G7|CR_T1, COCKBURN_CCG1|E_T3	Detail
N	NMI	The 10 digit National Metering Identifier provided by the Metering Data Agent.	Example: 1234567890	Detail
SA	SESSM Award	A string that uniquely identifies the SESSM Award.	Example: SESSM-001	Detail
FE	Facility-Essential System Service	A string that uniquely identifies the Essential System Service for a Facility.	Contingency Reserve Raise: <F>|CONTINGENCY_RAISE Contingency Reserve Lower: <F>|CONTINGENCY_LOWER Regulation Raise: <F>|REGULATION_RAISE Regulation Lower: <F>|REGULATION_LOWER RoCoF Control Service: <F>|ROCOF_CONTROL_SERVICE where • <F> is the same as scope F Example: PERTHENERGY_KWINANA_GT1|REGULATION_RAISE	Detail
NC	Network Contingency	A comma separated list of network equipment that trip (e.g. NBT-NT 92) and short codes for the network schemes that trigger (e.g. SPS_MARNET).	Example: NIL * NBT-NT 91, SPS_MARNET [LargestContingency]	Detail
FNC	Facility-Network Contingency	A string that uniquely identifies the Network Contingency for a Facility.	Format: <F>|<NC> where • F is the same as scope F • NC is the same as scope NC Example: YANDIN_WF1|NIL * NBT-NT 91, SPS_MARNET [LargestContingency]	Detail

Scope	Name	Description	Format and Example	Relevant Artefact(s)
SCC	Separately Certified Component	A string that uniquely identifies the Separately Certified Component.	Examples: COLLIE_BESS2_ESR_01, YANDIN_WF1_IGS_01, PINJAR_GT3_NIGS_01	Detail
F	Facility	A string that uniquely identifies the Facility.	Examples: COLLIE_ESR1, YANDIN_WF1, PINJAR_GT3	Detail
P	Participant	A string that uniquely identifies the Rule Participant, ERA or the Coordinator.	Examples: IMOWA, COE, ERA	Summary Detail Invoice
G	Global	A string that represents the WEM.	Global	Summary Detail

2.4 Variable Granularity

The granularity component of a variable describes the timeframe to which the variable relates. The following table describes the granularities and formats provided in the Settlement Statement and Invoice artefacts. The description of each granularity aligns with the Glossary in the WEM Rules and is not repeated here.

Table 3   Variable granularity formats

Granularity	Name	JSON Format	CSV Format	Relevant Artefact(s)
D	Trading Day	yyyy-mm-ddThh:mm:ss The tradingDay in the tradingDays array e.g. 2024-12-01T00:00:00	yyyy-mm-dd The Trading Day represented by the Timestamp e.g. 2024-12-01	Summary Detail
I	Trading Interval	Derived from the position in the Value array of the tradingDay in the tradingDays array where • position 1 is the 1st Trading Interval • position 48 is 48th Trading Interval	Derived from the position in the Value array of the Trading Day represented by the Timestamp where • position 1 is the 1st Trading Interval • position 48 is 48th Trading Interval	Detail
DI	Dispatch Interval	Derived from the position in the Value array of the tradingDay in the tradingDays array where • position 1 is the 1st Dispatch Interval • position 288 is 288th Dispatch Interval	Derived from the position in the Value array of the Trading Day represented by the Timestamp where • position 1 is the 1st Dispatch Interval • position 288 is 288th Dispatch Interval	Detail
M	Trading Month	Derived from the tradingDay in the tradingDays array where • tradingDay represents the first Trading Day of the Trading Month e.g. 2024-12-01T00:00:00 for December 2024	Derived from the Trading Day represented by the Timestamp where • Timestamp represents the first Trading Day of the Trading Month e.g. 2024-12-01 for December 2024	Detail
CY	Capacity Year	Derived from the tradingDay in the tradingDays array where • tradingDay represents the first Trading Day of the Capacity Year e.g. 2024-10-01T00:00:00 for Capacity Year 2024	Derived from the Trading Day represented by the Timestamp where • Timestamp represents the first Trading Day of the Capacity Year e.g. 2024-10-01 for Capacity Year 2024	Detail
FY	Financial Year	Derived from the tradingDay in the tradingDays array where	Derived from the Trading Day represented by the Timestamp where	Detail

Granularity	Name	JSON Format	CSV Format	Relevant Artefact(s)
		• tradingDay represents the first Trading Day of the Financial Year e.g. 2024-07-01T00:00:00 for the Financial Year commencing 1 July 2024	• Timestamp represents the first Trading Day of the Financial Year e.g. 2024-07-01 for the Financial Year commencing 1 July 2024	
X	Independent of time	Derived from the tradingDay in the tradingDays array where • tradingDay represents the first Trading Day of the Contract or SESSM Award time range	Derived from the Trading Day represented by the Timestamp where • Timestamp represents the first Trading Day of the Contract or SESSM Award time range	Detail
X	Trading Week	Derived from the tradeWeek in the Data array where • tradeWeek represents the Trading Week as published in the Settlement Timeline	N/A	Invoice

3 Settlement Statements

3.1 Overview

AEMO provides Settlement Statements in two parts:

- **Settlement Statement Summary**: the high-level summary of a Settlement Statement for a Trading Week, associated with a Rule Participant.
- **Settlement Statement Detail**: the low-level details of a Settlement Statement for a Trading Day, associated with a Rule Participant.

The format of the data in these artefacts is described in the following sections.

3.2 Settlement Statement Summary artefacts

3.2.1 Variables

The Settlement Statement Summary contains the variables outlined in Section 5.1 "Variable Categorisation" of the Formulation.

The variables are provided in granularity D (Trading Day) and scope P (Participant) and use the formats described in Sections 2.3 and 2.4.

3.2.2 JSON format

The Settlement Statement Summary is provided in JSON format via an API documented in the Developer Portal (Section 5).

3.2.3 CSV format

The Settlement Statement Summary is provided in CSV format through the PaSS user interface, and access is described in the Prudential and Settlements Service User Guide.

The CSV format is described in Table 4.

Table 4   Fields in the Settlement Statement Summary CSV file

Field	Description	Type	Format and Example
RunId	The identifier of the settlement run calculation	Integer	e.g. 50000
PublishedAt	The time the RunId was published by AEMO	String	yyyy-MM-ddTHH:mm:ss e.g. 2023-10-31T15:30:45
MarketService	The market service of the RunId	String	WEM
Designation	The designation of the RunId used to indicate an initial calculation or an adjustment calculation	String	INITIAL | ADJ1 | ADJ2 | ADJ3
Period	The Trading Week associated with the RunId, as published in the Settlement Timeline	String	TW dd mmm yyyy e.g. TW 01 Oct 2023
PeriodFrom	The first Trading Day of the Period	String	yyyy-mm-dd e.g. 2023-10-01

Field	Description	Type	Format and Example
PeriodTo	The last Trading Day of the Period (inclusive)	String	yyyy-mm-dd e.g. 2023-10-08
ParticipantCode	The identifier of the Rule Participant associated with the RunId	String	e.g. IMOWA
Variable	The variable name associated with the RunId	String	Refer to Section 5.1 "Variable Categorisation" of the Formulation
Timestamp	The Trading Day associated with the Variable	String	yyyy-mm-dd e.g. 2023-10-05
P Or C	Indicates whether the Variable is a payment from AEMO to the Rule Participant (Payment) or a charge paid by the Rule Participant to AEMO (Charge)	String	Payment | Charge
GST Applicable	Indicates if GST is applicable (Y) or if GST is not applicable (N) to the Variable	String	Y | N
Value	The value associated with the Variable	Number	Decimal(23,8) e.g. 123.12345678

3.3 Settlement Statement Detail artefacts

3.3.1 Variables

The Settlement Statement Detail contains the variables outlined in Section 4 "Calculation Engine" of the Formulation when those variables are required to be calculated for the Rule Participant. Exceptions apply to sets which are not typically provided in the results due to the size of the data.

The Settlement Statement Detail also contains the variables in Section 3 "Metering Calculation Engine" of the Formulation when those variables are used as inputs to the formulas in Section 4 of the Formulation.

The variables are provided in various granularities and scopes and use the formats described in Sections 2.3 and 2.4.

3.3.2 JSON format

The Settlement Statement Detail is provided in JSON format via an API documented in the Developer Portal (Section 5).

3.3.3 CSV format

The Settlement Statement Detail is provided as a single ZIP file through the PaSS user interface, and access is described in the Prudential and Settlements Service User Guide.

The ZIP file contains one CSV file per Trading Day in the Trading Week.

The CSV format is described in Table 5.

Table 5   Fields in the Settlement Statement Detail CSV file

Field	Description	Type	Format and Example
RunId	The identifier of the settlement run calculation	Integer	e.g. 50000
PublishedAt	The time the RunId was published by AEMO	String	yyyy-MM-ddTHH:mm:ss e.g. 2023-10-31T15:30:45

Field	Description	Type	Format and Example
MarketService	The market service of the RunId	String	WEM
Designation	The designation of the RunId used to indicate an initial calculation or an adjustment calculation	String	INITIAL | ADJ1 | ADJ2 | ADJ3
Period	The Trading Week associated with the RunId, as published in the Settlement Timeline	String	TW dd mmm yyyy e.g. TW 01 Oct 2023
PeriodFrom	The first Trading Day of the Period	String	yyyy-mm-dd e.g. 2023-10-01
PeriodTo	The last Trading Day of the Period (inclusive)	String	yyyy-mm-dd e.g. 2023-10-08
ParticipantCode	The identifier of the Rule Participant associated with the RunId	String	e.g. IMOWA
Settlement Trading Day	The Trading Day associated with the RunId and Period	String	yyyy-mm-dd e.g. 2023-10-05
Variable	The variable name associated with the RunId and Period	String	Refer to the Formulation
Scope	The object associated with the Variable, which changes depending on the scope of the Variable	String	Refer to Section 2.3 of this Guide
Timestamp	The time period associated with the Variable, which changes depending on the granularity of the Variable. Some Variables may be calculated for Timestamps outside the Period e.g. MFRATE_G_FY is required for every Settlement Trading Day within the Period but has a Timestamp representing the start of the Financial Year of the Settlement Trading Day.	String	Refer to Section 2.4 of this Guide
Value	The value(s) associated with the Variable	Array	Variable with Trading Interval granularity: "[value1,value2,…,value48]" Variable with Dispatch Interval granularity: "[value1,value2,…,value288]" "Variable with other granularity: "[value]" where value is Decimal(23,8) e.g. [123.12345678,0.0,0.00002334,0.0…]

4 Settlement Invoices

4.1 Overview

Invoices contain an itemised list of payments to the Rule Participant and charges paid by the Rule Participant that are associated with the Settlement Statement. Each of the line item amounts may change between positive and negative values as a result of the Adjustment Process.

Invoices are issued for initial Settlement Statements and adjusted Settlement Statements.

4.2 Invoice sections

Invoices contain various sections of information in accordance with the WEM Rules and Australian tax legislation.

Table 6   Invoice sections

Section	Content	Application
Payment Summary	• Lists all GST applicable payments and charges line items. • Lists all GST not applicable payments and charges line items. • Displays total amount payable for all listed items, less any prepayments applied. • Displays prepayment balance, less any prepayments applied.	• All Invoices
Recipient Created Tax Invoice (RCTI)	• Supplier is the Participant and Recipient is AEMO. • Lists all GST applicable payments line items, negated. • Lists all GST not applicable payments line items, negated. • Displays total payable by AEMO for the listed items.	• All Invoices
Tax Invoice	• Supplier is AEMO and Recipient is the Participant. • Lists all GST applicable charges line items. • Lists all GST not applicable charges line items. • Displays total payable to AEMO for the listed items.	• All Invoices
Adjustment Information	• Displays difference between current run and previous run for the Recipient Created Tax Invoice. • Displays difference between current run and previous run for Tax Invoice.	• Only Invoices for adjusted Settlement Statements

4.3 Invoice artefacts

4.3.1 JSON format

Invoices are provided in JSON format via an API documented in the Developer Portal (Section 5).

4.3.2 PDF format

Invoices are provided in JSON and PDF format via an API documented in the Developer Portal (Section 5).

Invoices are provided in PDF format in the PaSS user interface, and access is described in the Prudential and Settlements Service User Guide.

4.4 Invoice line items

Invoices contains line items for the variables outlined in Section 5.1 of the Formulation.

The line items are provided in granularity X and scope P (participant).

On the Invoice for an initial Settlement Statement, each line item is aggregated to a Trading Week.

On the Invoice for an adjusted Settlement Statement, each line item is aggregated to a Trading Week, then displayed as the difference between the amount calculated for the current settlement run to the amount calculated for the previous published settlement run for the same Trading Week.

5 APIs

AEMO uses the Developer Portal platform to document the APIs for the PaSS application and share the information with Rule Participants.

The PaSS APIs have not been integrated into the APIM at this time. This has implications for the certificate type and other requirements/behaviours that are explained via the links below.

Table 7   API references

API information	URL
Prudentials	https://dev.aemo.com.au/WEM-Prudential
Settlements	https://dev.aemo.com.au/WEM-Settlement