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# **Draft EMMS Release Schedule and Technical Specification – 5MS and GS – Settlements and Billing**

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**0.02 Draft August 2019**

5MS Staging: March 2020

Pre-production: November 2020

Production: May 2021

Release series: EMMS5MSSET10521

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# Important Notice

## PURPOSE & AUDIENCE

This document describes the technical changes required to participant's systems for the Five-Minute and Global Settlement (Release). The Australian Energy Market Operator (AEMO) provides this information as a service targeting business analysts and IT staff in participant organisations. It provides guidance about the changes to their market systems under the National Electricity Rules (Rules), as at the date of publication.

## HOW TO USE THIS DOCUMENT

- If you have questions about the business aspects of these changes, please see Consultations on [AEMO's website](#).
- The references listed throughout this document are primary resources and take precedence over this document.
- Unless otherwise stated, you can find resources mentioned in this guide on AEMO's website.
- **Text in this format** is a link to related information.
- **Text in this format**, indicates a reference to a document on [AEMO's website](#).
- **Text in this format** is an action to perform in the MSATS Web Portal.
- This document is written in plain language for easy reading. Where there is a discrepancy between the Rules and information or a term in this document, the Rules take precedence.
- Glossary Terms are capitalised and have the meanings listed against them in the **Glossary**.
- Rules terms defined in the NER are listed in the Rules section.

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## VERSION HISTORY

0.02 Draft of the 5MS Settlements and Billing, Global Settlements technical specification including details of the new Electricity Data Model.

## DOCUMENTS MADE OBSOLETE

The release of this document changes only the version of Draft EMMS Release Schedule and Technical Specification – 5MS and GS – Settlements and Billing.

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# 1 Introduction

The Draft EMMS Release Schedule and Technical Specification – 5MS and GS – Settlements and Billing Release includes changes related to participants' IT systems. The release schedule and technical specification describes the projects planned by AEMO from a participant perspective.

## 1.1 Background

This section details the 5MS changes to the Settlements and AEMO's real-time operational systems.

### 1.1.1 Global Settlement (GS)

On 6 December 2018, the AEMC made a final rule requiring a move to a Global Settlement framework for the demand side of the wholesale electricity market.

AEMO releases new versions of this document as the technical requirements are streamlined.

The AEMC made this rule for the following key reasons:

- Improved transparency, leading to fewer settlement disputes and lower levels of Unaccounted for Energy (UFE) over time.
- Competition on equal terms.
- Improved risk allocation driving enhanced incentives.

### 1.1.2 Five Minute Settlement (5MS)

On 28 November 2017, the AEMC made a final rule to alter the trading interval for the wholesale electricity Spot Market from 30 minutes to five minutes for pricing. The changes are effective from 1 July 2021.

The AEMC determined the five-minute settlement provides a better price signal for investment in fast response technologies, such as batteries, new gas peaking Generation, and demand response. The alignment of the operational dispatch and financial settlement periods lead to more efficient bidding, operational decisions, and investment.

The 5MS updates are divided into different workstreams based on functionality as follows:

- Dispatch and Bidding
- Retail and Metering
- Settlements

For more information, see the 5MS Systems High-Level Impact Assessment (HLIA) document

## 1.2 Audience

AEMO provides this information as a service targeting business analysts and IT staff in participant organisations.

## 1.3 Project List

The Five-Minute and Global Settlement (Release) includes the following projects:

**Package: BILLING\_RUN** ..... 14

**Package: SETTLEMENT\_DATA** ..... 16

## 1.4 Schedule

Scheduled for implementation in:

- 5MS Staging: March 2020
- Pre-production: November 2020
- Production: May 2021

The following changes are under consultation and not definite at this stage.

## 1.5 Proposed timeline

The dates for the Market System User Group Meetings (MSUG) are tentative. AEMO provides an invitation a week prior to the meeting.

Milestone	Date	Description
Approval required	TBC	The final date for participant approval of this Release.
Revised Technical Specification	20 December 2019	Further details of the changes to assist IT staff with their own technical implementation.
5MS Staging	16 March 2020	AEMO starts implementing components of the Release to the 5MS Staging environment for participant testing. Participant access is not restricted; however, the data content or system availability is not guaranteed. Functionality is expected to be released in stages to this environment.

Milestone	Date	Description
Pre-production refresh	TBC	Refresh of the pre-production system with data refreshed from the production system. An outage of up to five days can occur to the pre-production environment during this period. Participant access is not restricted, however, AEMO do not guarantee the pre-production data content or system availability. During the refresh, access to other AEMO systems such as AWEFS, EMMS, OPDMS, and STTM may be intermittently affected.
Pre-production implementation	November 2020	AEMO implements components of the Release to pre-production for participant testing. AEMO has full access to the system during this period. Participant access is not restricted; however, the data content or system availability is not guaranteed.
Pre-production Data Model release	March 2020	Participant Data Model scripts released.
Pre-production available	November 2020	The testing period begins for participants.
User group meeting: pre-production review	TBC	Market systems user group meeting to review the implementation of this pre-production release.
Production implementation	May 2021	AEMO implements the release to production.
Production systems available	1 July 2021	Go live. Production systems available to participants
First 5-minute energy settlement run and first UFE publication	2 July 2021	Initial 5-minute run for 1 July 2021. UFE is calculated and included in the reports for Market Participants but assigned according to existing systems.
Split billing week	27 June 2021 – 3 July 2021	Billing week will be a mix of five-minute and 30-minute settlement
Global Settlement starts	6 February 2022	From 6 Feb 2022, UFE is applied and charged to Market Participants.

**Summary:**

- From 1 July 2021, AEMO executes processes based on five-minute data volumes.
- The first Settlement run with five-minute energy data volumes is scheduled to run on 2 July 2021 (wholesale settlement systems process always runs for the previous day).
- AEMO supports both 30-minute and 5-minute energy data volumes to allow for a smoother transition on 1 July 2021.
- AEMO publishes UFE data for reporting purposes from 1 July 2021. Participants are charged UFE in the settlement calculations from 6 Feb 2022.

## 1.6 Approval to change

The changes are continually discussed and updated as a part of the 5MS Systems Working Group and other 5MS Consulting Forum meetings. There is no approval to change required from participant change controllers at this time.

Amendments to the Rules regarding five-minute settlements are published on the AEMC website: [National Electricity Amendment \(Five-minute settlement rule\) 2017](#).

Amendments to the Rules regarding Global Settlements are published on the AEMC website: [National Electricity Amendment \(Global Settlement and Market Reconciliation\) 2018](#).



# 2 Settlements Overview

The Settlements system is part of the Electricity Market Management System that depends on information from Registration and Dispatch systems and calculates amounts owing to or owned by each party including AEMO.

This document details the 5MS and GS changes to the Settlements stream.

The following changes are under consultation and not definite at this stage.

## 2.1 Settlements Stream

The Settlements stream includes Settlements, Billing, Invoicing, Reallocations, and Prudentials.

This version of the document focuses on the updates to the Settlements and Billing packages.

From 1 July 2021, the following services are impacted:

- Transactions are calculated every five minutes.
- Settlement estimation calculates energy transactions every five minutes.
- The inter-regional and intra-regional residue surplus are calculated on a five-minute basis.
- Several non-energy transactions, such as market ancillary services (such as FCAS) are completed using five-minute energy volumes.

## 2.2 Settlements

AEMO settles the NEM in a 30-minute resolution.

From 1 July 2021, AEMO processes data based on five-minute data (both energy and price). AEMO publishes the Settlement reconciliation data at the same resolution as the associated settlement run.

## 2.3 Billing

Billing aggregates all settlement days in a billing period, calculates GST, interest and other billing items.

With five-minute settlements, billing executes aggregation of both 5-minute and 30-minute settlement amounts. There are format changes to the statements to apply to both line items and GST amounts.

- 1 July 2021 is mid billing week.
- Billing handles both 30-minute and five-minute data processed across different settlement runs within the billing week of 27 June 2021 to 3 July 2021 (transitional week).
- Transitional Week:
  - Produce Settlements Run Report as per the current process.
  - Produce PDF Tax Invoice as per the current process
  - Data tables in Data Interchange can be utilised to identify five-minutes vs 30 minutes.

The following changes are under consultation and not definite at this stage.

## 2.4 Mandatory Restrictions compensation calculation

Mandatory Restrictions are a means to control the electricity supply in a region in times of extreme scarcity. The Settlements and Billing systems no longer include Mandatory Restrictions. If necessary, it is calculated manually and included in the statements as a part of the Revision Adjustment. With the five-minute settlements, the Mandatory Restrictions are removed from EMMS.

## 2.5 Settlements Data Interchange

With the five-minute settlements, the definition of PeriodID changes from 30 minutes (1 to 48) to five minutes (1 to 288).

- Data interchange prior to 1 July 2021 retains a 30-minute PeriodID. The “Interval Length” column in the settlement tables determines the granularity.
- Additional indicators are added for ‘interval length’ to specify the length of an interval in each settlement run.
- A new version of the Electricity data model for 5MS. This will be an optional upgrade as the data model is backwards compatible with the existing ‘legacy’ version.
- All Settlements results tables in Data Interchange have the two columns (SettlementDate/SettlementRunNo.) as the first elements of the primary key.
- Participants can use ‘Interval Length’ to compare historical data and with both formats (five-minute and 30-minute).
- Data Model tables containing Mandatory Restrictions (MR) and Smelter Reductions are removed from the Data Interchange. For the list of related tables, see Discontinued tables.

The following changes are under consultation and not definite at this stage.

## 2.6 Invoicing

With the five-minute settlements, a new flexible invoicing system is available. The PDF statement filename structure will remain the same as before:

<PARTICIPANTID>\_<REPORTNAME>\_<BILLINGWEEKSTARTDATE>.RNN

Where:

- Participant ID
- Report Name for example, for a preliminary summary statement, the report name is PDFNONFINALSS
- Date of the billing week start day in the format YYYYMMDD
- Bill run number

The following image shows the new invoice:

**AEMO**  
AUSTRALIAN ENERGY MARKET OPERATOR

<Statement Type>

Reference:   
MSATS Case ID:

<Participant Name>  
ABN:   
<Participant Address>

Enquiries  
1300 361 011

Statement Date  
06 Nov 2018

Statement Total  
\$

Summary of NEM Transactions  
for Week 25: 17 Jun 2018 - 23 Jun 2018

Description	\$
Energy	<input type="text"/>
Ancillary Services	<input type="text"/>
Settlement Residue Auction	<input type="text"/>
Market Fess	<input type="text"/>
TNSP Residue	<input type="text"/>
Security Deposits	<input type="text"/>
Reallocation	<input type="text"/>
Revision Adjustment	<input type="text"/>
Revision Interest	<input type="text"/>
Early Payment Interest	<input type="text"/>
Other	<input type="text"/>
GST	<input type="text"/>
Reassignment	<input type="text"/>
Total	<input type="text"/>

Notes to the statement

For 5MS, Smelter reduction and Mandatory Restrictions are no longer displayed in the 'Summary of the NEM Transactions' or 'Detailed Transactions' section of any invoice statement.

## 2.7 Settlement Reports

The NEM billing system generates the Settlement report in a text file format. With the five-minute settlements, the billing system includes new DME, UFEA columns in the Settlement report at Transmission Node Identifier (TNI) level. The updated SR report includes new columns as shown below:

```

SETTLEMENT REPORT
-----
REPORT FOR ██████████
REVISION 1 Settlements ref ██████████
MSATS CASEID: ██████████
-----
09-Sep-2018 to 15-Sep-2018                               Week No 37
-----
Energy Transactions
                Aggregate      Trading
                Energy (MWh)    Amount ($)
-----
Total Sales                ██████████ ██████████
Total Purchases            ██████████ ██████████
-----
Nett Sales (Purchases)    ██████████ ██████████
-----

Sales (Purchases) by Transmission Connection Point
-----
Transmission  Description      Trading    Load Wtd Avg.   Aggregate
Node           Description      Amount ($)  Price ($/MWh)   Energy (MWh)   DME (MWh)   UFEA (MWh)

```

The new columns are available from 1 July 2021. Adjusted Gross Energy (AGE) is available in the Aggregated Energy column and moved from after Description to before DME (MWh). This does not include Unaccounted for Energy (UFE) between 1 July 2021 and 6 February 2022.

The new SR Reports removes the following sections:

- Metered Data Agent column in the 'Sales (Purchases) by Transmission Connection Point'.
- Mandatory Restrictions
- Smelter Reduction

# 3 Global Settlements

This section describes the updates for Global Settlements.

## 3.1 Global Settlements

Global Settlements changes how the unaccounted for energy (UFE) is calculated and allocated. Currently, based on the total energy consumed in a network, the UFE for a local area is apportioned to participants responsible at the Transmission Connection Point (TCP).

With GS, the UFE is now assigned to each participant in the Distribution Network based on the energy they consume. To facilitate allocation of UFE, from 1 July 2021, meter data providers (MDPs) provide AEMO metering data for all participants and notify AEMO of the consumption of metered loads.

The following changes are under consultation and not definite at this stage.

AEMO reports UFE calculation from 1 July 2021 and applies it to AGE calculations from 6 February 2022.

## 3.2 AEMO reports on UFE

In order to compile with the Rules for reporting the UFE, AEMO creates the following files in csv format:

### 3.2.1 Settlement data extract file

UFE information is added to the confidential settlement data extract file. The settlement data extract file (in the csv format) adds the following additional data for each settlement run number, market participant, settlement day, trading interval and TNI:

- Local Area ID
- DME in MWh is the amount represented by  $(ME - * DLF)$  for a connection point and trading interval.
- UFEA in MWh is the allocation of unaccounted for energy for a relevant connection point and trading interval.
- AGE in MWh which includes UFEA
- For participant where UFE is not applicable, the data extract will display a UFE of zero.

This report is private meaning participants only have access to their data.

### 3.2.2 Local Area UFE Data Extract file

A new data extract report titled Local Area UFE Data Extract available publicly through NEMWEB. This report is in csv format and produced for each settlement run for a combination of the LA and TI.

This report includes the following details:

- Settlement run number
- Local Area ID
- Settlement date
- Trading Interval (5 minutes) ID
- ADME in MWh is the aggregate of the amounts represented by  $(ME * DLF)$  for that trading interval for each connection point.
- TME in MWh is the amount of electrical energy flowing at each transmission network connection point in the local area in the trading interval.
- DDME in MWh is the amount of electrical energy flowing at each of the distribution network connection points in the local area, connected to an adjacent local area in the trading interval.
- UFE in MWh for the LA and TI
- AGE in MWh is the adjusted gross energy for the local area and trading interval which include UFE.

For more details on the terms and definitions, see [NER Rules: Global Settlements](#).

# 4 Electricity Data Model 5.00

This Release contains a new version of the Electricity Data Model 5.00. This section describes the affected packages, tables, files, reports, and interfaces.

With 5MS, all Settlements and Billing tables use five-minute data even if the structure of the table does not change. For Metering, all tables except the ones listed in Discontinued tables use five-minute data.

The Release has changes to the following packages:

**Package: BILLING\_RUN** .....20

**Package: SETTLEMENT\_DATA**.....22

The following changes are under consultation and not definite at this stage.

## 4.1 Data Model changes summary

Package	Table name	Change	Details
BILLING_RUN	BILLINGCPDATA	Modified table	Changes for 5MS/Global Settlements
SETTLEMENTS_DATA	SETCPDATA	Modified table	Changes for Global Settlements
	SETLOCALAREAENERGY	New table	Changes for Global Settlements
	SETLOCALAREATNI	New table	Changes for 5MS
	SETMARKETFEEES	Modified table	Changes for Global Settlements

## 4.2 Modified packages and tables

Package	Table name	Change	Details	Primary Key
BILLING_RUN	BILLINGCPDATA	Modified table includes new and updated columns	AGGREGATEENERGY (Existing) PURCHASES (Existing) AFE DME UFEA UFEADOLLARVALUE	BILLRUNNO CONNECTIONPOINTID CONTRACTYEAR MDA PARTICIPANTID WEEKNO
SETTLEMENTS_DATA	SETCPDATA	Modified table includes new and updated columns	INENERGY (Existing) XNENERGY (Existing) AFE DME UFEA AGE	MDA PARTICIPANTID PERIODID SETTLEMENTDATE TCPID VERSIONNO
	SETLOCALAREAENERGY	New table	SETTLEMENTDATE SETTLEMENTRUNNO LOCALAREAID PERIODID UFE DDME TME ADME ADMELA LASTCHANGED	SETTLEMENTDATE SETTLEMENTRUNNO LOCALAREAID PERIODID



Package	Table name	Change	Details	Primary Key
	SETLOCALAREATNI	New table	SETTLEMENTDATE SETTLEMENTRUNNO LOCALAREAID TNI LASTCHANGED	SETTLEMENTDATE SETTLEMENTRUNNO LOCALAREAID TNI
	SETMARKETFEEES	Modified table includes new columns	FEERATE FEEUNITS	MARKETFEEID PARTICIPANTCATEGORYID PARTICIPANTID PERIODID RUNNO SETTLEMENTDATE

# Package: BILLING\_RUN

Results from a published Billing Run. The settlement data and billing run data are updated daily between 6am and 8am for AEMO's prudential processes. In a normal week, AEMO publishes one PRELIM, one FINAL and two REVISION runs in addition to the daily runs. Each billing run is uniquely identified by contract year, week no and bill run no.

## 4.3 Modified table: BILLINGCPDATA

Comment	BILLINGCPDATA shows energy quantity and \$ value purchased per participant connection point.
Visibility	Private
Trigger	Populated by the posting of a billing run, being several times each week
Participant file share location	<#INTERFACE>\<#PARTICIPANTID>\IMPORT\REPORTS\CSVREPORTS
Primary key (in order)	BILLRUNNO, CONNECTIONPOINTID, CONTRACTYEAR, MDA, PARTICIPANTID, WEEKNO

The following changes are under consultation and not definite at this stage.

### 4.3.1 Modified Columns: BILLINGCPDATA

Field Name	Data Type	Description	Primary Key
AGGREGATEENERGY (EXISTING)	NUMBER (16,6)	As per existing column, plus UFEA. When GS commences on 6 Feb 2022, this includes the UFEA amount in the settlement runs.	N

Field Name	Data Type	Description	Primary Key
PURCHASES (EXISTING)	NUMBER	Financial value of energy transactions for the Market Customer and FRMP and TNI in the billing run.  When GS commences on 6 Feb 2022, this includes the UFEA amount in the settlement runs.	
AFE	NUMBER (18,8)	Adjusted Gross Energy for this Market Customer FRMP and TNI in the billing run, excluding any UFEA component.	N
DME	NUMBER (18,8)	Sum of ME- for all NMI's at this Market Customer FRMP and TNI in the billing run.	N
UFEA	NUMBER (18,8)	Share of UFE allocated to this FRMP and TNI in the billing run.	N
UFEADOLLARVALUE	NUMBER (18,8)	Financial value of UFEA for this Market Customer FRMP and TNI in the billing run. Until GS commences on 6 Feb 2022, this value is 0 in the settlement runs.	N

# Package: SETTLEMENT\_DATA

Results from a published Settlements Run. The settlement data and billing run data are updated daily between 6 am and 8 am for AEMO's prudential processes. In a normal week, AEMO publishes one PRELIM, one FINAL and two REVISION runs in addition to the daily runs.

## 4.4 Modified table: SETCPDATA

Comment	SETCPDATA shows meter settlement data for each connection point. This is the key view for retailers to verify energy charges. A regional summary view is also provided. As the view has values for each connection point by period, for each meter data file, it is a very large view.
Visibility	Private
Trigger	Updates after each Settlement run
Participant file share location	<#INTERFACE>\<#PARTICIPANTID>\IMPORT\REPORTS\CSVREPORTS
Primary key (in order)	MDA, PARTICIPANTID, PERIODID, SETTLEMENTDATE, TCPID, VERSIONNO

The following changes are under consultation and not definite at this stage.

#### 4.4.1 Modified Columns: SETCPDATA

Field Name	Data Type	Description	Primary Key
INENERGY (existing)	NUMBER (18,8)	As per existing column, plus UFEA if the UFEA amount is positive. When GS commences on 6 Feb 2022, this includes the UFEA amount in the settlement runs.	N
XNENERGY (existing)	NUMBER (18,8)	As per existing column, plus (UFEA * -1) if the UFEA amount is negative. When GS commences on 6 Feb 2022, this includes the UFEA amount in the settlement runs.	N
AFE	NUMBER (18,8)	Adjusted Gross Energy for this Market Customer FRMP and TNI in the trading interval, excluding any UFEA component.	N
DME	NUMBER (18,8)	Sum of ME- for all NMI's at this Market Customer FRMP and TNI in the trading interval.	N
UFEA	NUMBER (18,8)	Share of UFE allocated to this FRMP and TNI in the trading interval	N
AGE	NUMBER (18,8)	Adjusted Gross Energy for this Market Customer FRMP and TNI in the trading interval. When GS commences on 6 Feb 2022, this includes the UFEA amount in the settlement runs.	N

## 4.5 New table: SETLOCALAREAENERGY

Comment	SETLOCALAREAENERGY shows the UFE, AGE and associated values for each local area and trading interval in a settlement run.
Visibility	Public
Trigger	Updates after each Settlement run
Participant file share location	<#INTERFACE>\<#PARTICIPANTID>\IMPORT\REPORTS\CSVREPORTS
Primary key (in order)	SETTLEMENTDATE, SETTLEMENTRUNNO, LOCALAREAID, PERIODID

### 4.5.1 New Columns: SETLOCALAREAENERGY

Field Name	Data Type	Description	Primary Key
SETTLEMENTDATE	DATE	Settlement date of the settlement run	Y
SETTLEMENTRUNNO	INTEGER	Settlement run number of the settlement run	Y
LOCALAREAID	VARCHAR2 (30)	Unique identifier for the local area	Y
PERIODID	INTEGER	Period identifier	Y
UFE	NUMBER (18,8)	Total unaccounted-for energy for the local area in this trading interval, in MWh	N
DDME	NUMBER (18,8)	DDME component of UFE for the local area in this trading interval, in MWh.	N

Field Name	Data Type	Description	Primary Key
TME	NUMBER (18,8)	TME component of UFE for the local area in this trading interval, in MWh.	N
ADME	NUMBER (18,8)	ADME component of UFE for the local area in this trading interval, in MWh.	N
ADMELA	NUMBER (18,8)	The sum of all DME amounts for each Market Customer FRMP and TNI in the local area, in this trading interval.	N
LASTCHANGED	DATETIME	Last changed date for the record	

## 4.6 New table: SETLOCALAREATNI

Comment	SETLOCALAREATNI shows the list of TNIs constituent to a local area in a settlement run.
Visibility	Public
Trigger	Updates after each Settlement run
Participant file share location	<#INTERFACE>\<#PARTICIPANTID>\IMPORT\REPORTS\CSVREPORTS
Primary key (in order)	SETTLEMENTDATE, SETTLEMENTRUNNO, LOCALAREAID, PERIODID

### 4.6.1 New Columns: SETLOCALAREATNI

Field Name	Data Type	Description	Primary Key
SETTLEMENTDATE	DATE	Settlement date of the settlement run	Y

Field Name	Data Type	Description	Primary Key
SETTLEMENTRUNNO	INTEGER	Settlement run number of the settlement run	Y
LOCALAREAD	VARCHAR2 (30)	Unique identifier for the local area	Y
TNI	VARCHAR2 (30)	Unique identifier for a TNI constituent to the local area as-at the settlement run	Y
LASTCHANGED	DATETIME	Last changed date for the record	

## 4.7 Modified table: SETMARKETFEEES

Comment	SETMARKETFEEES shows payments for market fees for each settlement date.
Visibility	Private
Trigger	Updates after each Settlement run
Participant file share location	<#INTERFACE>\<#PARTICIPANTID>\IMPORT\REPORTS\CSVREPORTS
Primary key (in order)	MARKETFEEID, PARTICIPANTCATEGORYID, PARTICIPANTID, PERIODID, RUNNO, SETTLEMENTDATE

### 4.7.1 New Columns: SETMARKETFEEES

Field Name	Data Type	Description	Primary Key
FEERATE	NUMBER (18,8)	The rate applied to this fee for the participant at the settlement date.	N



Field Name	Data Type	Description	Primary Key
FEEUNITS	NUMBER (18,8)	The number of units applicable to this fee for the participant, in the trading interval.	N

## 4.8 Participant interfaces changes

Package Name	MMS Data Model table	File ID	CSV report type	Change
BILLING_RUN	BILLINGCPDATA	BILLING	BILLING_RUN,BILLINGCPDATA,6	Modified
SETTLEMENT_DATA	SETCPDATA	SETTLEMENTS	SETTLEMENT_DATA,SETCPDATA,6	Modified
	SETLOCALAREAENERGY	SETTLEMENTS	SETTLEMENT_DATA,SETLOCALAREAENERGY,1	New
	SETLOCALAREATNI	SETTLEMENTS	SETTLEMENT_DATA,SETLOCALAREATNI,1	New
	SETMARKETFEEES	SETTLEMENTS	SETTLEMENT_DATA,SETMARKETFEEES,6	Modified

## 4.9 File interface changes

Package ID	File ID	Description	Batcher file masks	Frequency	Modification	Auto-subscription
BILLING_RUN	BILLING	Modifies the BILLINGCPDATA table and the tables contain information for five-minute periods instead of 30-minute periods.	*_BILLING_RUN_*.CSV	Weekly	Modified	No

Package ID	File ID	Description	Batcher file masks	Frequency	Modification	Auto-subscription
SETTLEMENT_DATA	SETTLEMENTS	Modifies the SETCPDATA, SETMARKETFEEES tables and adds new tables for SETLOCALAREAENERGY, SETLOCALAREATNI tables and the tables contain information for five-minute periods instead of 30-minute periods.	*_SETTLEMENT_DATA*.CSV	Daily	Modified	No

## 4.10 Discontinued tables

**Participants must ensure all dependencies on these tables are removed prior to the deployment of this Release otherwise participant processes may be impacted.**

MMS Data Model table	Change detail
BILLING_MR_PAYMENT	
BILLING_MR_RECOVERY	
BILLING_MR_SHORTFALL	
BILLING_MR_SUMMARY	With 5MS, Mandatory Restrictions and Smelter Reductions are no longer included in any reports from trading day 1 July 2021.
BILLINGSMELTERREDUCTION	
SET_MR_PAYMENT	
SET_MR_RECOVERY	
GENUNITMTRPERIOD	
INTERCONNMWFLOW	These tables are discontinued from 5MS Metering release date (December 2020).
METERDATA	
METERDATA_TRK	

## 4.11 Non-functional changes

MMS Data Model table	Change detail
MMS Data Model Upgrade Report	Updated for new Data Model version and AEMO branding
MMS Data Model Report	
MMS Data Model Package Summary	
MMS Data Model Table to File to Report Relationships workbook	

# 5 Implementation

## 5.1 Transition

Participants are required to upgrade their Data Model versions to 5.00 to receive the new 5MS Reallocations information. For details, see Electricity Data Model 5.00.

This section is a draft and subject to the 5MS Readiness Workstream transition and cutover forums.

## 5.2 Implications

To maintain systems in line with AEMO's market systems, participants need to:

- Review the changes implemented as part of this Release and assess the impact on their market systems.
- Change their systems prior to the implementation of this Release.
- Schedule staff and resources to upgrade their market systems for the production implementation of this Release.

## 5.3 Risks

Participants not subscribed to the latest versions of files using the Data Subscriptions web application will not receive the new data. Upgrade options

## 5.4 Upgrade options

From a wholesale energy market system's focus, participants need to:

- Review the changes implemented as part of this Release and assess the impact on their market systems.
- Plan to upgrade their Data Interchange installations to the latest versions to utilise benefits from the new functionality, operate against newly supported platforms, and to maintain ongoing support from AEMO.
- Schedule staff and resources to upgrade their market systems from the implementation of this Release. To maintain systems in line with AEMO's market systems, AEMO recommends upgrading within six months of the implementation date.
- Change their systems prior to the deployment of this Release to ensure they are up to date. AEMO recommends participants' wholesale market systems are compliant with the latest Data Interchange software versions, see **Data Interchange Framework and Glossary**.

## 5.5 What happens if I do not upgrade?

If participants' systems are compliant with AEMO's supported configuration defined in [DI Framework and Glossary](#), this Release does not impact MMS Data Model systems immediately. Depending on participants' systems, not upgrading may result in the following issues:

- Participant's database does not receive the new fields or tables because the Data Model elements are not created.
- Participants not subscribed to the latest versions of files using the Data Subscriptions web application will not receive the new data.
- Content in legacy files may change after deployment of this Release.

If participants have a system dependency on the formats of the non-MMS Data Model reports, they need to manage these dependencies using the detail provided in this technical specification. Participants need to review and assess the impact on their market systems with respect to the changes implemented as part of this Release.

**AEMO encourages participants to make use of the four-week pre-production period, to assess and test any impact to their market systems and business processes. Participants using data replication products critical to their business are strongly advised to participate in the pre-production rollout and testing period.**

# 6 Rules Terms

This section lists the terms defined in the [National Electricity Rules \(NER\)](#).

Rules Terms	Rules Terms	Rules Terms
Adjusted Gross Energy	Final Statement	Reactive Power
Ancillary Services	Generated	Reallocations
Billing	Generating Unit	Reliability
Billing Period	Generation	Reliability and Emergency Reserve Trader (RERT)
Carbon Dioxide Equivalent Intensity Index	Generation Centre	Reserve
Compensation Recovery Amount	Load Shedding	Settlements
Connection point	Local Area	Settlement Statements
Dispatch Interval	Mandatory Restrictions	Settlements Residue
Distribution	Market Customer	Spot Market
Distribution Loss Factor	Market Participant	Spot Price
Distribution Network	MWh Offset	Tax
Energy	NEM	Trading Interval
Ex Post Reallocation	Power System	Transmission Node
Flat	Preliminary Statement	
	Prudential Requirements	

# 7 Related Resources

You can find the following resources on AEMO's website:

**National Electricity Rules ("The Rules"):** Provides details on the national electricity rules that govern all system and process/procedural changes.

**NER Amendment – 5MS:** Explains the amendments to the Rules regarding five-minute settlements. See 'National Electricity Amendment (Five-minute settlement rule) 2017'.

**NER Amendment – GS:** Explains the amendments to the Rules regarding Global settlements. See 'National Electricity Amendment (Global Settlement and Market Reconciliation) Rule 2018'.

**Final Report – Structure of Participant Fees in AEMO's Electricity Markets 2016:** Equations for Market Fees.

**Structure of Participant Fees in AEMO's Electricity Full Retail Competition Market (2017):** Equations for Market Fees.

**NEM Transmission Network Service Provider Negative Settlements Residue Procedure:** Equations for Intra-Regional Residues.

**Methodology for the Allocation and Distribution of Settlements Residue:** Equations for Intra-Regional Residues.

**NEM Settlement Equations:** Equations put together by the settlements team, input to this requirements document.

**5MS Factsheet:** Provides an overview of what 5 Minute Settlement (5MS) is, and how AEMO is going about implementing the change.

**5MS High Level Design:** Provides information about the potential design of AEMO processes and systems to support the proposed introduction of five-minute settlement'.

**Data Interchange Framework and Glossary:** provides important information about upgrading your Data Interchange (DI) environment, explains DI terms, and DI related resources. Please read this guide in conjunction with this technical specification.

**Guide to AEMO's e-Hub APIs:** Provides details about using AEMO's e-Hub as an interface to communicate information with AEMO. It assists Wholesale electricity and gas participants developing their own APIs.



**Guide to Electricity Information Systems:** Provides guidance for *Registered Participants* and interested parties about AEMO's participant electricity market systems.

**Guide to User Rights Management:** Assists participant administrators (PAs) to use the user rights management functions in the MSATS Web Portal.

**Guide to Markets Direct:** Explains how to use the Markets Portal Market Direct web application providing participants with access to reports and statements published by AEMO.

# 8 Glossary

Abbreviation	Explanation
<b>30-minute period</b>	New term to replace 'trading interval', where the period needs to remain as 30 minutes
<b>5MS</b>	Five-Minute Settlement Program
<b>AEMC</b>	Australian Energy Market Commission
<b>AEMO</b>	Australian Energy Market Operator
<b>AEST</b>	Australian Eastern Standard Time
<b>AGE</b>	Adjusted Gross Energy
<b>APA</b>	Auction Participation Agreement
<b>Billing Period</b>	7 days from the first trading interval on a Sunday to the last trading interval on the next Saturday.
<b>Company ID</b>	<p>In AEMO IT system, Participant ID sits under a Company ID. A Company ID can have multiple Participant IDs.</p> <p>AEMO IT system currently identifies Market Participant as a Participant ID, except for FCAS recovery calculation was changed in 2015.</p> <p>However, as part of the 5MS project, it is required that AEMO system identifies Company ID as Market Participant in accordance with the rules.</p>
<b>CSV files</b>	Files containing data in comma separated values format.
<b>Data Interchange</b>	Data Interchange (DI) is a set of cooperating applications to replicate data between AEMO's systems and a participant's RDBMS conforming to the MMS or Gas Data Model.
<b>Dispatch Interval</b>	Obsolete term. See Trading Interval.
<b>DLF</b>	Distribution Loss Factor
<b>DUID</b>	Dispatch unit ID
<b>Electricity Data Model</b>	Data published to participants by AEMO from NEM systems.
<b>EMMS</b>	(Wholesale) Electricity Market Management System. Single web portal interface to access AEMO's IT systems; software, hardware, network and related processes used to operate the energy market.

Abbreviation	Explanation
<b>EMMS Data Model</b>	AEMO's federated data model in Electricity Wholesale markets for replication of internal data to market participants.
<b>Equation Variables</b>	Some requirements refer to the formulation document which contains the equations and uses various variables. The equation variables have been defined in this document, this is located <a href="#">here</a> .
<b>FCAS</b>	Frequency control ancillary services
<b>Fixed Load</b>	Optional MW, not greater than the max. availability. When supplied as '0', this was interpreted as 'not inflexible', but this will now be interpreted as 'fixed at 0' (i.e no output).
<b>FRMP</b>	Financially Responsible Market Participant. It is equivalent to the Participant ID in the AEMO IT system.
<b>GS</b>	Global Settlement
<b>GST</b>	The goods and services tax governed by A New Tax System (Goods and Services Tax) Act 1999 (Cth) and related legislation.
<b>Inter-regional Settlements Residue (IRSR)</b>	That part of the Settlements residue arising from energy flow across notional interconnectors.
<b>IRSR</b>	Inter-regional Settlements Residue.
<b>IRSS</b>	Intra-regional Settlements Residue.
<b>LA</b>	Local Area
<b>Market Customer</b>	AEMO's registration category. Market Customers are typically retailers or large users who draw energy from the transmission grid.
<b>Market Participant</b>	<p>AEMO IT system currently identifies Market Participant as a Participant ID.</p> <p>However, as part of the 5MS project, it is required that AEMO system identifies Market Participant as a Company ID.</p> <p>Note: In AEMO IT system, Participant ID sits under a Company ID. A Company ID can have multiple Participant IDs.</p>
<b>ME</b>	Metered Energy.
<b>MDM</b>	Meter Data Management.

Abbreviation	Explanation
<b>MLF</b>	Marginal Loss Factor. Note: Some AEMO documents use Transmission Loss Factor (TLF) and Marginal Loss Factor (MLF) interchangeably. This document uses the term TLF to indicate loss factor.
<b>MNSP</b>	Market Network Service Provider.
<b>MSATS</b>	(Retail) Market Settlement & Transfer Solution.
<b>NEM</b>	National Electricity Market.
<b>NEMDE</b>	NEM Dispatch Engine.
<b>Net Energy Flow</b>	Metering reads calculated at regional boundary which is used to derive the energy flow at each end of the interconnector.
<b>NER</b>	National Electricity Rules. <a href="https://www.aemc.gov.au/regulation/energy-rules/national-electricity-rules/current">https://www.aemc.gov.au/regulation/energy-rules/national-electricity-rules/current</a> . Often just called 'the Rules'.
<b>NMI</b>	National Metering Identifier.
<b>Notional Interconnector</b>	The concept of a notional interconnector is used to provide a simple radial link representation of individual transmission lines that form a physical interconnection between adjacent Regional Reference Nodes (RRN)s. It represents one or a number of parallel transmission lines that physically cross the region boundary, plus supporting transmission lines within the regional networks that form a meshed path to the respective RRNs.
<b>NSP</b>	Network Service Provider. In practice, this refers to TNSPs and Distribution Network Service Providers.
<b>Participant</b>	A registered organisation participating in the NEM.
<b>Participant ID</b>	In AEMO IT system, Participant ID sits under a Company ID. A Company ID can have multiple Participant IDs.  AEMO IT system currently identifies Market Participant as a Participant ID, except for FCAS recovery calculation was changed in 2015.  However, as part of the 5MS project, it is required that AEMO system identifies Market Participant as a Company ID, and FRMP as a Participant ID.
<b>RBF</b>	Regional Benefit Factor.
<b>RCTI</b>	Receipt Created Tax Invoice.
<b>RERT</b>	Reliability and Emergency Reserve Trader.

Abbreviation	Explanation
<b>RMC</b>	Registration Management Client.
<b>RRN</b>	Regional Reference Node.
<b>RRP</b>	Regional Reference Price.
<b>SDA</b>	Security Deposit Amount
<b>Settlements database</b>	Data warehouse for all EMMS market systems data, plus the EMMS settlements/metering database.
<b>Settlement day</b>	Calendar day starting at 12am. Where 'day' unless otherwise specified, the 24-hour period beginning and ending at midnight Eastern Standard Time (EST).
<b>SR</b>	Settlements Report
<b>SGA</b>	Small Generator Aggregator.
<b>SIMMS</b>	Settlement Interface Market Management System.
<b>Small customer</b>	Under Market Customer registration category, small customers are the ones with meter type small.
<b>SOM</b>	Settlements Operations Manual.
<b>SRIS</b>	Settlement Residue Information System.
<b>TLF</b>	Transmission Loss Factor. Note: Some AEMO documents use Transmission Loss Factor (TLF) and Marginal Loss Factor (MLF) interchangeably. This document uses the term TLF to indicate loss factor.
<b>TNI</b>	Transmission Node Identifier. In the document this is referred to as Transmission Connection Point in some instances.
<b>TNISF</b>	Wholesale Connection Point Scaling Factor
<b>TNSP</b>	Transmission Network Service Provider.
<b>Trading Day</b>	"The 24-hour period commencing at 4.00 am and finishing at 4.00 am on the following day." (NER) Where 'day' "Unless otherwise specified, the 24-hour period beginning and ending at midnight Eastern Standard Time (EST).
<b>TUOS</b>	Transmission Use of System.
<b>UFE</b>	Unaccounted for Energy.
<b>UFEA</b>	UFE prorated to each NMI load.

Abbreviation	Explanation
<b>WCP</b>	Wholesale Connection Point. In the document this is referred to as Connection Point in some instances.

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