



5MS Systems Working Group

SWG#1 - Friday, 24 August 2018

AEMO Offices:

Level 9, 99 Gawler Place, Adelaide

Level 10, 10 Eagle Street, Brisbane

Level 22, 530 Collins Street, Melbourne

Level 2, 20 Bond Street, Sydney

DIAL IN: 1800 055 132 MEETING ID: **98394756**

Agenda

NO	TIME	AGENDA ITEM	RESPONSIBLE
Preliminary Matters			
	10:00am - 10:10am	Welcome, introduction and apologies	Hamish McNeish (AEMO)
Matters for Noting			
	10:10am – 10:20am	Re-cap on 5MS	Graeme Windley (AEMO)
	10:20am – 10:40am	5MS program engagement	Graeme Windley (AEMO)
Matters for Discussion			
	10:40am - 11:10am	SWG and focus group approach	Hamish McNeish (AEMO)
	11:10am – 11:30am	System workstream scope	Hamish McNeish (AEMO)
	11:30am - 12:10pm	NEM Retail Systems	Satheesh Kumar (AEMO)
	12:10pm – 12:40pm	Lunch Break	
	12:40pm – 1:20pm	NEM Wholesale Systems	Hamish McNeish (AEMO)
Other business			
	1:20pm – 1:40pm	General questions	Hamish McNeish (AEMO)
	1:40pm – 1:45pm	Forward meeting plan	Hamish McNeish (AEMO)

Re-cap on 5MS

Graeme Windley

5MS Summary

AEMC Decision

- Final rule change made 28 Nov 2017 with industry go live 1 July 2021
- Removes the anomaly between five-minute dispatch and 30-minute settlement, which has been identified as a contributing factor to disorderly bidding.
- Provides a clearer price signal for investment in fast response technology, including batteries and demand response.

Key functional implications of 5MS include:

Metering

- Central systems acceptance of five-minute metering data from the market.
- Adjusting interval meters to deliver data at five-minute intervals.
- Controlled Load Profile (CLP) and Net System Load Profile (NSLP) change from 30-minute to five-minute.

5MS Summary

Settlement and Metering Calculations

- Profiling algorithms introduced to derive five-minute energy data.
- Transactions will need to be calculated for each five-minute period.
- Settlement estimation will calculate energy transactions for every five-minute period.
- Inter-regional and intra-regional residue will be calculated on a five-minute basis.
- A number of non-energy transactions, such as market ancillary services (i.e. FCAS) and compensation recovery, will be completed using five-minute energy volumes.

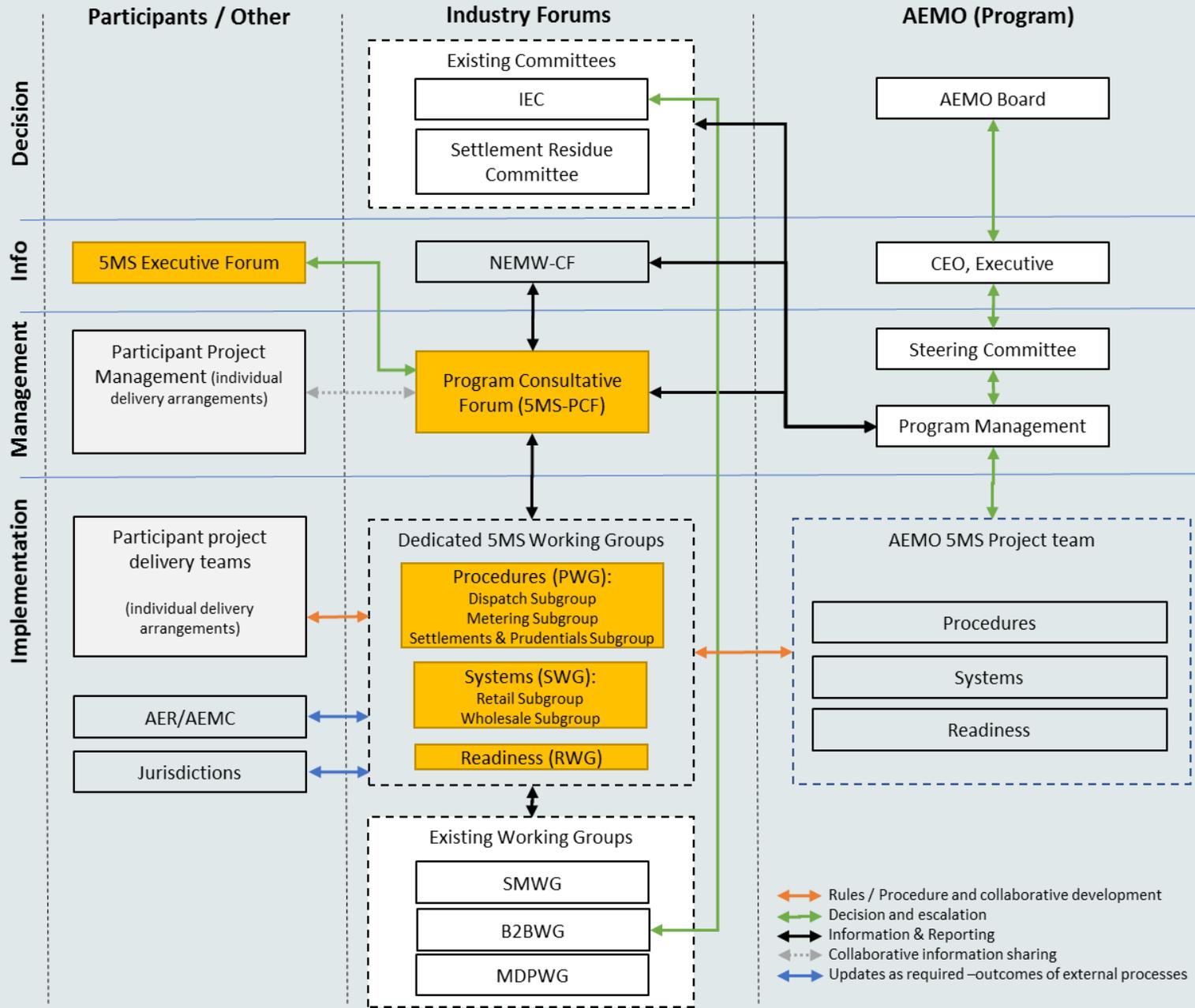
Dispatch & Market Information

- Daily bidding intervals to increase from 48 to 288. AEMO will create new data structures to receive, use and store five-minute bids and offers.
- 30-minute pre-dispatch and PASA processes that use bid information will be provided with five-minute data.
- Market participant systems will need to be updated to submit and receive confirmations of five-minute bid and offer data.
- AEMO will publish five-minute data.

5MS Program Engagement

Graeme Windley

Program engagement structure



Program forums and groups

Group	Purpose	Timing
Program Consultative Forum (5MS-PCF)	The primary program coordination and communication between AEMO and industry program teams (meets monthly)	Monthly, starting July 2018
Executive Forum (5MS-EF)	Provide appropriate level of executive oversight and escalation of issues and concerns (meets quarterly)	Every 2 months, starting July 2018
Procedure Working Group (5MS-PWG)	To facilitate the consultation on procedures, with focus groups for dispatch, metering, and settlements	Monthly, starting August 2018 (focus groups as required)
Systems Working Group (5MS-SWG)	To facilitate design and implementation of systems and interfaces, with focus groups covering retail and wholesale interfaces	Monthly, starting August 2018 (focus groups as required)
Readiness Working Group (5MS-RWG)	Formed in the lead-up to industry readiness testing, to support the planning and execution of readiness activities	Monthly, starting mid-2019

Other forms of engagement

- Focus groups
- Consultations (Rules-based)
- Email updates
- Newsletter
- Fact Sheets
- Face to face
- Information sessions

SWG and focus group approach

Hamish McNeish

SWG objectives

- The SWG provides a forum for:
 - AEMO to inform and consult during AEMO's and Industry's IT development on changes to AEMO's participant facing systems
 - Ensure sufficient information and systems are provided to support industry's own system change
 - Ensure a clear approach and timeline to AEMO system implementation and deployment
 - Industry to raise concerns or issues early in the system development process
 - Seek feedback on proposed changes and the impacts to industry stakeholders (including vendors)
- Refer to the Terms of Reference included in the SWG#1 pack
 - Available at: <http://aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement>

SWG expectations

- Expected that the SWG will meet monthly
 - Held by video conference in Brisbane, Sydney, Melbourne and Adelaide
 - Tele-conference dial-in, however preference for attendance in person at an AEMO office
- SWG members are expected to:
 - have authority to consider SWG matters on behalf of their business
 - have detailed IT knowledge on their IT systems that interface with AEMO's IT systems
 - be prepared to participate in discussion
 - provide information on SWG processes and outcomes back into their business
- The SWG is not a decision-making group – escalation of any contentious matters will be via AEMO's program and the Executive Forum

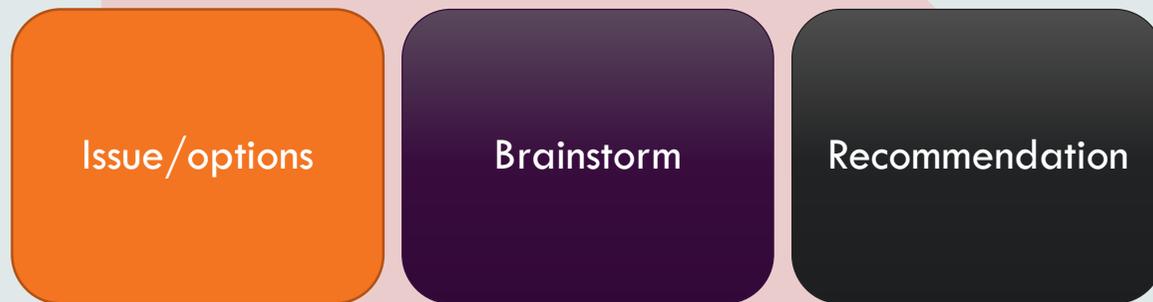
SWG Options

SWG Options:

1. Split an SWG into Retail and Wholesale
e.g. Morning on Retail, afternoon on Wholesale
2. Schedule separate Retail and Wholesale sessions

Focus Groups

- A smaller group, e.g. 5 to 10 representatives
- Will be face-2-face in AEMO's Melbourne office to facilitate brainstorming/discussion
- Focus on a particular technical issue or options as needed
- Not every business will need to be represented



- Recommendations will be presented back to the SWG

PWG and SWG Relationship

- Procedure consultation and subsequent AEMO decisions will drive requirements for system change
- AEMO system design will align to the 5MS procedures work program
- As procedural consultation continues there is the possibility of change after initial system design
- As system design continues this may also affect procedures
- Procedural items raised in the SWG will be referred to the PWG
- Technical implementation items raised in the PWG will be referred to the SWG
- Joint focus groups may be required between PWG and SWG participants for cross dependencies

Procedures Workstream

5 MINUTE SETTLEMENT PROCEDURES TRACKING	TIMING					CONTENT
	HLIA	PWG Engagement	Consultation paper	Draft documents	Final documents	Package content
METERING						
1. Metering - Metering Data & Metrology	Jul-18	Jul-18	Sep-18	Nov-18	Jan-19	
2. Metering - MSATS and SLPs	Jul-18	Nov-18	Feb-19	May-19	Jul-19	
3. Metering - Miscellaneous*	Jul-18	Feb-19	Mar 19*	n/a	Jul-19	
SETTLEMENTS						
SRA	Jun-18	Jul-18	n/a	Jul-18	Aug-18	
TNSP	Mar-19	Apr-19	Jun-19	Aug-19	Oct-19	
Estimation	Aug-18	Aug-18	Nov-18	Jan-19	Mar-19	
Reallocations	Dec-18	Mar-19	Apr-19	Jun-19	Aug-19	
Miscellaneous	Oct-18	Oct-18	Dec-18	Mar-19	Jun-19	
Prudentials	Aug-18	Sep-18	Nov-18	Jan-18	Mar-19	
DISPATCH						
1. Dispatch - Bids/Offers*	Jul-18	Jul 18 ongoing	n/a	n/a	Jan-19	
2. Dispatch - Spot market	Sep-18	Oct 18 ongoing	Jan-19	Apr-19	Jul-19	
3. Dispatch - Pricing	Aug-18	Aug 18 ongoing	Aug-18	Dec-18	Jul-19	
4. Dispatch - Specifications*	Jan-19	Feb-19	n/a	n/a	Jun-19	
5. Dispatch - Miscellaneous*	Jan-19	Feb-19	n/a	n/a	Jun-19	
POWER SYSTEM OPS						
1. Operations - Miscellaneous*	TBA	Apr 19 ongoing	n/a	n/a	Jul-19	
*no rules consultation required	TIMING			CONTENT		
	Started and on track			No issues		
	Started but late or not started			Issues		
	Overdue			Severe issues		

System workstream scope

Hamish McNeish

Workstream Approach

- Prioritisation of work – aligning to procedures and expected industry impact.
Initial Items:
 - Bidding Interface
 - Meter Data Interface
- Technical Specifications
 - Provide detail early
 - Provided in sections – rather than a full specification
- Sand Box Environment
 - Provided to test interfaces against technical specification
 - Will not be fully functional environments
- Transition
 - Minimise “big bang” cutover where possible
 - Systems rollout before 1 July 2021
 - Functionality may roll in or take effect from trading/calendar day 1 July 2021

System Workstream - Metering

- Planned dates are subject to PWG consultation progress
- Early Release depends on PWG outcomes

5 MINUTE SETTLEMENT SYSTEMS TRACKING	TIMING								
	Internal HLIA	SWG Engagement	Focus/Group	Draft Tech Spec	Final Tech Spec	User Guides	Sandbox	Preprod	Production
METERING									
Meter Data - MDFF	Aug-18	Aug-18	Sep-18*	Nov-18	Feb-19	-	Nov-19	TBC	Early Release
B2M MDFF (API and FTP)	Aug-18	Sep-18	Oct-18	Nov-18	Feb-19	-	Nov-19	TBC	Early Release
Standing Data and validations	Oct-18	Nov-18	Nov-18*	Feb-19	Jul-19	-	Nov-19	TBC	Early Release
B2M via eHub	Aug-18	Nov-18	Dec-18	Feb-19	Jul-19	-	-	TBC	TBC
MSATS Browser (LVI) changes	Oct-18	TBC	TBC	TBC	TBC	TBC	-	Nov-20	May-21
MSATS report changes (RM reports)	Oct-18	TBC	TBC	TBC	TBC	TBC	-	Nov-20	May-21

* = Potential joint focus groups with PWG

System Workstream - Dispatch

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5 MINUTE SETTLEMENT SYSTEMS TRACKING	TIMING								
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DISPATCH									
Bidding API's and Data Model	Aug-18	Sep-18	Sep-18	Oct-18	Feb-19	Oct-19	Nov-19	TBC	Early Release
Web Bidding	Aug-18	Sep-18	Oct-18	Mar-19	Jul-19	Oct-19	Nov-19	TBC	Early Release
Dispatch	Aug-18	Oct-18		Oct-18	Feb-19	-	Nov-19	TBC	Early Release
Predispatch (P5, P30)	Aug-18	Oct-18		Oct-18	Feb-19	-	Nov-19	TBC	Early Release
Trading Price / Price Revision	Aug-18	Nov-18	TBC	Mar-19	Jul-19	-	-	Nov-20	May-21
Administered Pricing and CPT	Aug-18	Nov-18		Mar-19	Jul-19	-	-	Nov-20	May-21
Suspension Pricing	Sep-18	Nov-18		Mar-19	Jul-19	-	-	Nov-20	May-21
Negative Residue Management	Sep-18	Feb-19		Mar-19	Jul-19	-	-	Nov-20	May-21
Full Data Model	Sep-18	Mar-19	TBC	Mar-19	Jul-19	Oct-20	-	Nov-20	May-21

NEM Retail Systems

Satheesh Kumar

NEM Retail System Change Heatmap

* Change likely based on PWG outcomes

B2M / B2B Interfaces

MDMT

B2M aseXML schema

NMID

CATS

MSATS B2M APIs

B2B Transactions

B2B aseXML schema

VIC TUoS

CATS / MDM Processes

Profiling

CATS Standing Data

Meter Data
Validation

Estimation /
Substitution

Energy Allocation

CR Processing

MSATS Browser / Reports

Meter Data screens

RM21/27

C1,4

RM11,12,13,14,16
RM17,18,19,20,22

RM28,30,31,32
RM33

SDR

RM7,8,9,10
RM15,29

C2,3,6,7,9,10

C11,12,13

B2M Meter Data

Status:
PWG CONSULT

Impact:
HIGH

Changes:

- Significant meter data volume increase predicted
- Transition to 5-minute interval reads

Impacts:

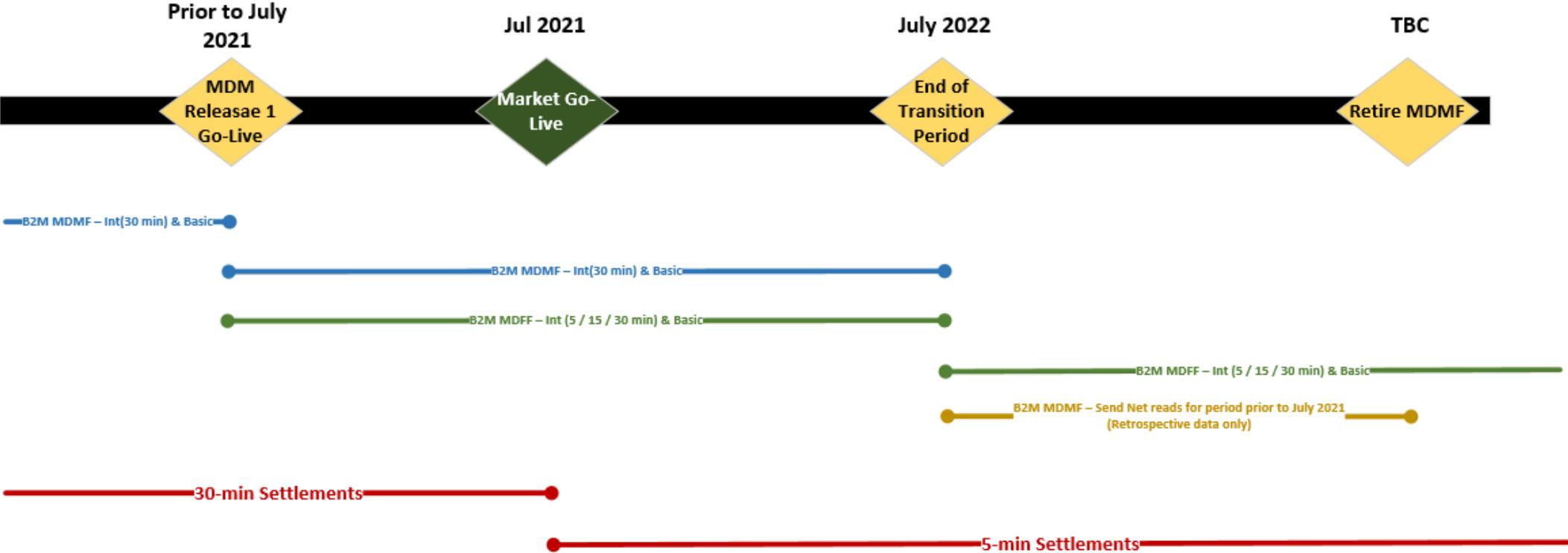
- Unified meter data file format B2B and B2M format MDFF (NEM12/NEM13)
- Need a mechanism to easily determine 5 vs 15 vs 30 content
- 1 MB limit may need to be increased
- New Web API interface for MDFF (FTP still supported)
- Review of 13 months online storage
- Validation of meter data streams

Transition:

- Early acceptance of MDFF format (prior to 1 July 2021) - 5/15/30-minute
- MDMT and 5/15/30-minute MDFF accepted from 1 July 2021
- MDMT format will be retired after transition period from 1 July 2021 (assume at least 12 months)

Retail Meter Data Transition

- *View of potential transition*



CATS/MDM Processes

Status:
PWG CONSULT

Impact:
HIGH

Changes:

- Profiling basic and interval meter reads
- Potential changes to attributes of Datastreams (based on PWG outcomes)

Impacts:

- AEMO MDM estimation process prior to energy allocation process
- Profiling basic meter reads to 5-min meter reads
- Profiling 30-min / 15-min meter reads to 5-min meter reads
- Energy allocation process @ 5-min resolution
- Energy allocation process – settlement by difference or global settlements (based on PWG outcomes)
- MSATS screens and RM* reports – Display of interval meter reads to support variety of interval lengths

Meter Data Architecture

Refer to the diagram included in the SWG#1 pack

NEM Wholesale Systems

Hamish McNeish

NEM Wholesale System Change Heatmap

* Change likely based on PWG outcomes

DISPATCH

Bids/Offers

Data Model

Dispatch

Predispatch
(P5/P30s)

Spot Price

Administered Pricing

Suspension Pricing

Constraints

Registration

SETTLEMENT

Settlement 5MS Calc.

Settlement GS Calc.

Estimation and
Prudentials

Reallocations

Data Model

IRSR Calc.

SRA

Causer Pays Factors

POWER SYSTEM

Negative Residue
Management

ST PASA

RERT

Data Model

MT PASA / EAAP

Demand Forecasting

Generator Recall

Wind/Solar
Availability

VAR/MW Dispatch

Bids/Offers

Status:
PWG CONSULT

Impact:
HIGH

Changes:

- Bids and offers shift from 48 periods to 288 periods
- Web bidding enhanced to be more functional
- Potential Rebid explanation field changes

Interfaces:

- Current TXT file format is deprecated, new JSON format introduced
- Web API interfaces introduced
- FTP interface kept for transition and backup
- Web bidding and upload file functionality kept
- Data Model – Add new 5-minute bid table(s)

Transition:

- Proposed early 5-minute bid support 3-6 months prior to 1 July 2021
- TXT file not supported from Trading Day 1 July 2021

Bidding Architecture

Refer to the diagram included in the SWG#1 pack

Dispatch / Predispatch / PASA

Status:
PWG CONSULT

Impact:
LOW

Changes:

- 5-minute bids used in Dispatch and P5
- Last 5-minute bid (or alternative) used in P30s
- Lowest 5-minute availability in ST PASA
- Possibility of increasing P5 length and doing price sensitivities

Interfaces:

- Dispatch no change in outputs
- P5 possibility of adding price sensitivities
- Predispatch / ST PASA no change in outputs
- Data Model – possible P5 length/sensitivities

Transition:

- Early Release to accept 5-minute bids
- 30-minute bids translated to 5-minute by AEMO

Spot Price

Changes:

- Spot prices changes from 30-minute to 5-minute
- 30-minute price still required to be published

Interfaces:

- Data Model – Likely change to 5-minute price tables
- Data Model – Trading Price kept

Transition:

- Early release of an initial Data Model

Status:
HLIA

Impact:
LOW

Administered Pricing

Changes:

- Cumulative Price Threshold (CPT) changed to 5-minute based
- Rolling Sum Price (RSP) calculation impacted

Interfaces:

- Administered pricing events
- Market notices likely message changes
- Data Model – None identified

Transition:

- Effective 1 July 2021 @ 12am (CPT becomes effective)
- Transition of RSP needs to be determined

Status:
HLIA

Impact:
LOW

Suspension Pricing

Changes:

- Changes to AEMO's price calculation

Interfaces:

- Price determination under market suspension
- Data Model – None identified

Transition:

- Effective 1 July 2021 @ 12am

Status:
HLIA

Impact:
LOW

Negative Residue Management

Changes:

- Shift to dispatch interval accumulation from 30-minute
- Use P5 negative residue forecast instead of P30

Interfaces:

- Dispatch Price/Schedule - NRM constraints acting
- Data Model - DISPATCH.NEGATIVE_RESIDUE

Transition:

- Effective 1 July 2021 @ 12am

Status:
HLIA

Impact:
LOW

Data Model

Avoid breaking change to align to rules terminology.
Descriptions can clarify discrepancies.

Changes:

- New 5-minute bid table(s)
- Likely 5-minute price data improvements
- Negative Residue table
- Settlement, billing, prudentials TBD

Interfaces:

- Data Interchange
- NEMWeb

Transition:

- Initial Early Release Data Model
- Full Data Model

Status:
HLIA

Impact:
HIGH

Other Items – not covered today

- RERT
- Settlement / Billing / Prudentials
- Mandatory Restrictions
- Others?

General Questions

Hamish McNeish

Forward Meeting Plan

Hamish McNeish

Proposed Next Sessions

SWG Focus Groups

- Sep-18 – Metering Data – MDFF, B2M interface
- Sep-18 – Bidding API's and Data Model

SWG's

- Sep-18
 - B2M MDFF (API and FTP)
 - Bidding API's and Data Model
 - Web bidding

5MS Meetings and Forum Dates:

<http://aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement>