



Five-Minute Settlement Program: Program Consultative Forum 7

AEMO 5MS Program Team

FRIDAY 8 FEBRUARY 2019

AEMO OFFICES:

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Agenda

NO	TIME	AGENDA ITEM	RESPONSIBLE
Preliminary Matters			
1	10:00am – 10:10am	Welcome, introduction and apologies	Chris Muffett (AEMO)
2	10:10am – 10:20am	Minutes and actions from previous meeting	Chris Muffett (AEMO)
Matters for Noting			
3	10:20am – 10:40am	Program update	Graeme Windley (AEMO)
4	10:40am – 11:00am	Industry risks & issues	Graeme Windley (AEMO)
5	11:00am – 11:10am	Procedures workstream update	Emily Brodie (AEMO)
6	11:10am – 11:20am	Systems workstream update	Hamish McNeish (AEMO)
7	11:20am – 11:30am	Stakeholder Update	Gary Eisner (AEMO)
Matters for Discussion			
8	11:30am – 11:50am	AEMO architecture for 5MS	Satheesh Kumar (AEMO)
9	11:50am – 12:10pm	Update on non-mandatory components	Chris Muffett (AEMO)
Other Business			
10	12:10pm – 12:20pm	General questions	Chris Muffett (AEMO)
11	12:20pm – 12:30pm	Forward meeting plan	Chris Muffett (AEMO)

Minutes and actions from previous meeting

Chris Muffett

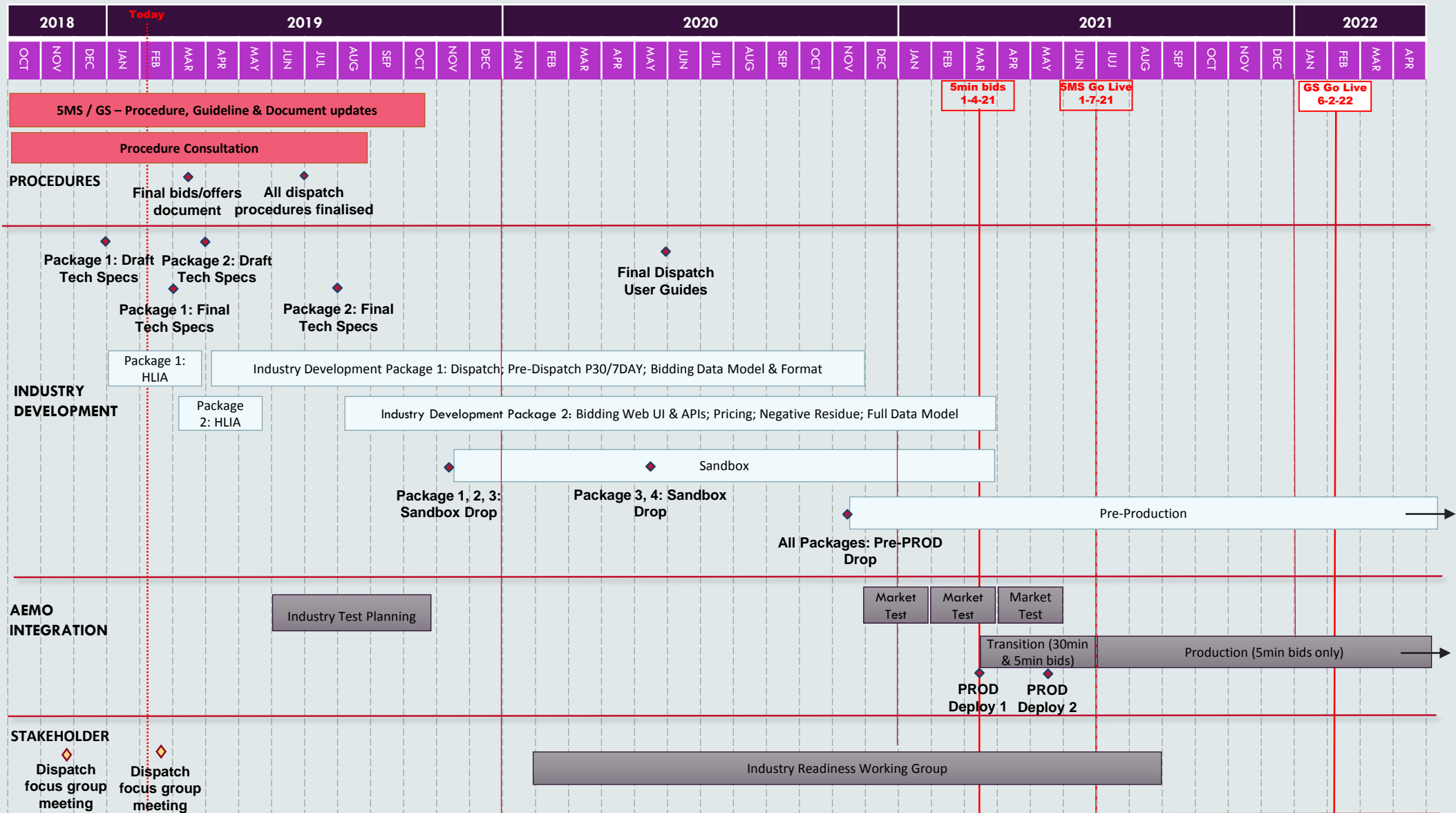
Program update

Graeme Windley

5 Minute & Global Settlements Program – INDICATIVE TRANSITION OVERVIEW – DISPATCH AND BIDDING SYSTEMS



Indicative Industry Overview V0.1 – 29 January 2019



Package 1: Dispatch; Predispatch P30/7DAY; PASA; Bidding Data Model; Bidding Format.

Package 2: Bidding Web UI and APIs

Package 3*: Predispatch P5

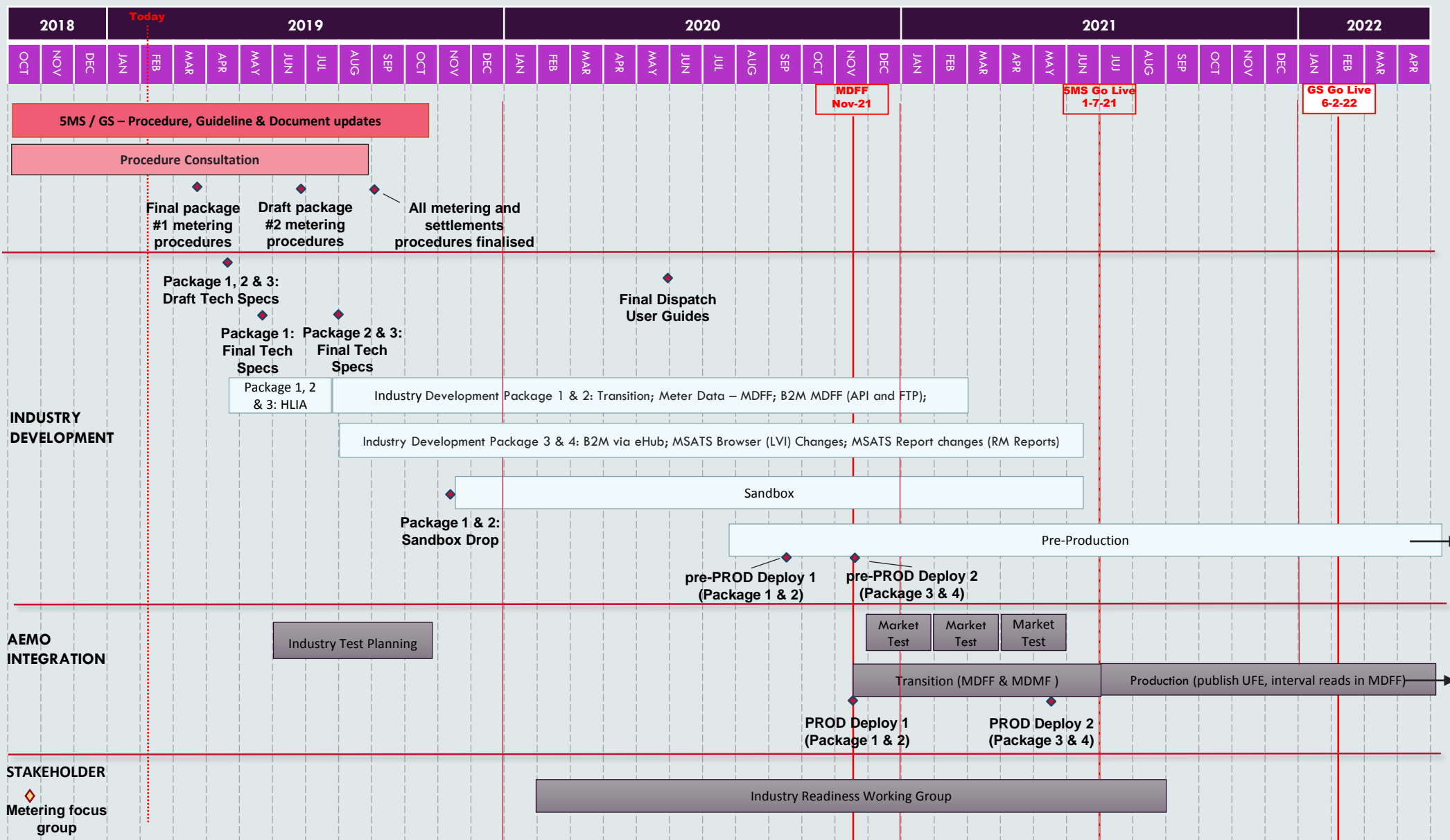
Package 4*: RERT, Trading Price / Price Revision; Administrated Pricing and CPT; Suspension Pricing; Negative Residue Management; Full Data Model[^]

* Dates TBC for External HLIA, Tech Spec and Sandbox

[^] Includes Settlements Data Models

5 Minute & Global Settlements Program – INDICATIVE TRANSITION OVERVIEW – METERING SYSTEMS

Indicative Industry Overview V0.1 – 29 January 2019



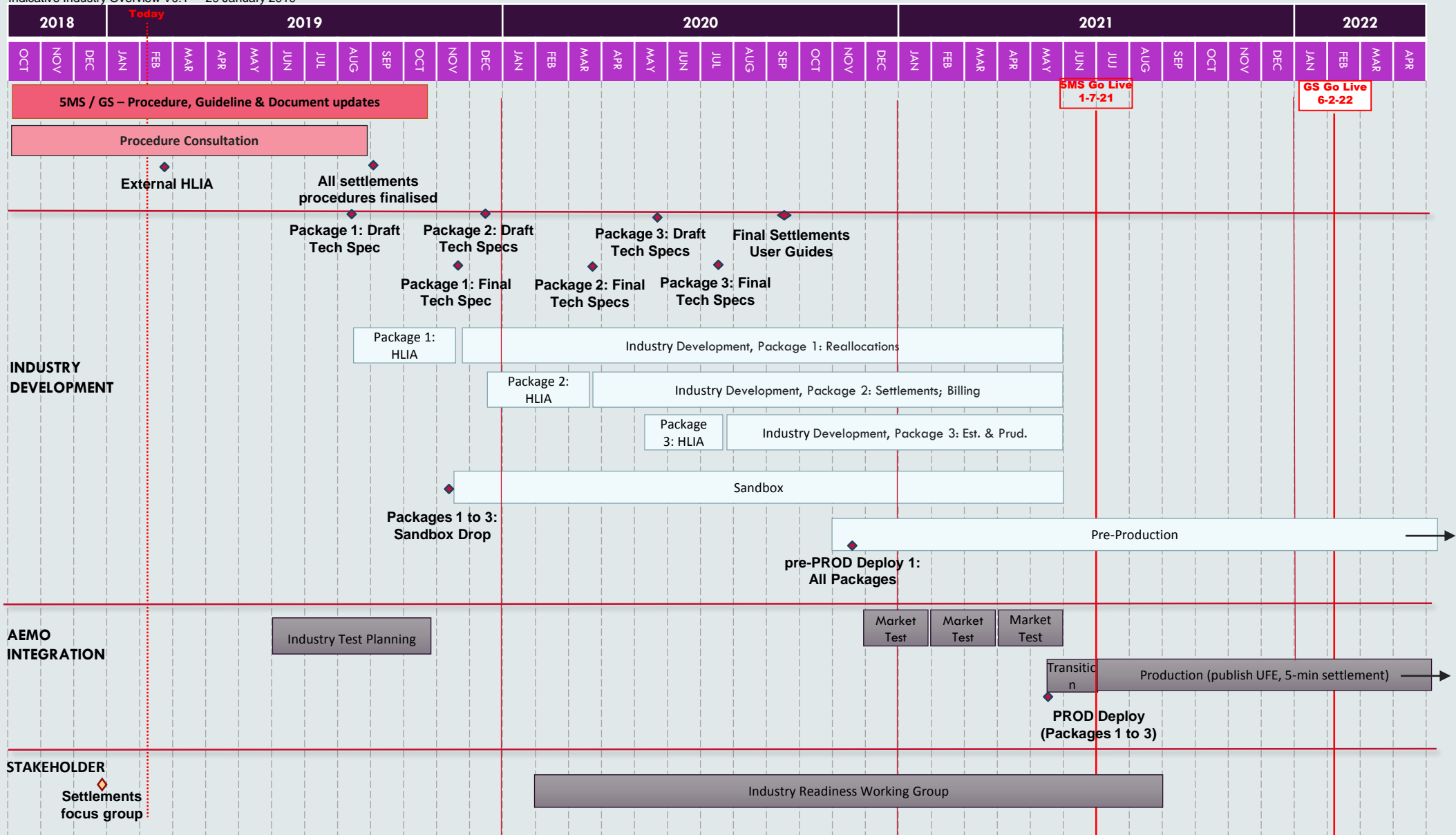
- Package 1:** Transition; Meter Data – MDFP; B2M MDFP (API and FTP);
- Package 2:** Standing Data and validations;
- Package 3:** B2M via eHub;
- Package 4*:** MSATS Browser (LVI) Changes; MSATS Report changes (RM Reports);

* Dates TBC for External HLIA, Tech Spec and User Guides

5 Minute & Global Settlements Program – INDICATIVE TRANSITION OVERVIEW – SETTLEMENT (and OPERATIONS) SYSTEMS



Indicative Industry Overview V0.1 – 29 January 2019



- Package 1:** Reallocation
- Package 2:** Settlements; Billing
- Package 3:** Estimation; Prudentials

For Information: HLIA = High Level Impact Assessment

◆ Milestone
◇ Working group meeting

For detailed meeting schedule and agendas, see AEMOs Stakeholder Relations Website

5MS Program Update

- Role update
 - Mal Borschman – 5MS IT Manager
 - Hamish McNeish – 5MS Technology Advisor
- AEMO Board Update
 - Messaging from Meeting Thursday 7 February
- Executive Forum
 - Wednesday 20 February
 - Peter Geers & Joe Locandro attending
 - Development of IT strategy
- Industry Timeline
 - Feedback from Participants

Industry risks & issues

Graeme Windley

Summary

- Latest risk/issue register included with meeting pack
- Risk/issue register is published on 5MS PCF page:
<http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement/Program-Management/Program-Consultative-Forum>
- AEMO welcomes any feedback from the PCF on the risks & issues

Procedures workstream update

Emily Brodie

Procedures workstream status

5 MINUTE SETTLEMENT PROCEDURES TRACKING	Pre-consultation		Consultation			CONTENT
	HLIA	PWG Engagement	TIMING			
			Consultation paper	Draft documents	Final documents	
METERING						
1. Metering - Metering Data & Metrology	Jul-18	Jul-18	Sep-18	Jan-19	Mar-19	
2. Metering - MSATS and SLPs	Jul-18	Dec-18 & Mar-19	Apr-19	Jun-19	Aug-19	
3. Metering - Miscellaneous*	Jul-18	Mar-19	n/a	Mar-19*	Jul-19	
B2B Procedures - B2B file size	n/a	Feb-19	TBC	TBC	TBC	
SETTLEMENTS						
SRA	Jun-18	Jul-18	n/a	Jul-18	Aug-18	
SRA round #2	Jun-18	Feb-19	Mar-19	Jun-19	Aug-19	
TNSP	Feb-19	Feb-19	Apr-19	n/a	Jun-19	
Estimation	Aug-18	Aug-18	Nov-18	Feb-19	Apr-19	
Reallocations	Dec-18	Dec-18	n/a	Dec-18	Feb-19	
Miscellaneous	Oct-18	Oct-18	Dec-18	Mar-19	May-19	
Prudentials	Aug-18	Sep-18	n/a	Apr-19	May-19	
DISPATCH						
1. Dispatch - Bids/Offers*	Jul-18	Jul 18 ongoing	n/a	Feb-19	Mar-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 - 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	

TIMING
Started and on track
Started late
Overdue

CONTENT
No issues
Issues
Severe issues

Procedures workstream meetings

- Next PWG scheduled for Tuesday 12th March:
 - Metering – Package 2 (MSATS and SLPs) and Package 3 (Miscellaneous)
 - Dispatch – debrief on dispatch focus group
 - Metering – possible debrief on metering focus group
- Focus groups:
 - Dispatch focus group – Friday, 15th February, Sydney
 - Metering focus group – late February/early March 2019, TBC
 - Settlements focus group –TBC

Consultations

AEMO: 5MS Metering package 1

- Draft Report & Notice of second stage consultation published on the 30 January 2019
 - On the proposed amendments to various metering procedures to support the implementation of 5MS
- Submissions on Draft Report due 15 February 2019
- Final report to be published 22 March 2019
- <http://aemo.com.au/Stakeholder-Consultation/Consultations/Five-Minute-Settlement---Metering-Procedure-Changes-Package-1>

AEMO: 5MS Settlements package - Revisions

- Consultation commenced 14 December 2018
- Submissions due 22 February 2019

Systems workstream update

Mal Borschman

System Workstream

5MS Systems Workstream status

- Dispatch and Settlement streams
 - Requirements gathering continues
 - Build of Development environments complete
 - Development and test resource confirmed
 - Development effort (environment shakeout) commenced
 - Test environment build nearing completion
- Retail stream
 - Requirements gathering continues
 - Vendor negotiations continue, recommendation tabled with Exec 25-Jan
 - WebMethods Development environment build in progress
 - Development work on interfaces expected to start February 2019
- IT Schedule
 - Detailed schedule build work continues with a key focus being on Industry deliverables
 - Schedules now have a 120 day baseline

Systems workstream update (2)

SWG#7

- Monday 18th February 2019
 - Introduce IT Org structure
 - Introduce the 5MS program Test manager & the test strategy
 - Introduce IT Stream leads (Retail, Dispatch, Settlements and Infrastructure)
 - Brief status update from each stream lead
 - Dispatch – Debrief from Focus Group

System Workstream - Metering

- Current estimated timeline

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

System Workstream - Dispatch

- Current estimated timeline

5 MINUTE SETTLEMENT SYSTEMS TRACKING	TIMING									
	Internal HLIA	Focus/Group	SWG Engagement	External HLIA	Draft Tech Spec	Final Tech Spec	User Guides	Sandbox	Preprod	Production
DISPATCH										
Transition	Aug-18	Oct-18	Aug-18	Nov-18	Dec-18	Feb-19	Oct-19	Nov-19	Nov-20	Mar-21
Bidding Web UI and APIs	Aug-18	Nov-18	Dec-18	Jan-19	Mar-19	Jul-19	Oct-19	Nov-19	Nov-20	Mar-21
Bidding Data Model	Aug-18	-	Sep-18	Mar-19	Dec-18	Feb-19	Oct-19	Nov-19	Nov-20	Mar-21
Bidding Format	Aug-18	-	Sep-18	Nov-18	Dec-18	Feb-19	Oct-19	Nov-19	Nov-20	Mar-21
Dispatch	Aug-18	-	Oct-18	Nov-18	Oct-18	Feb-19	-	Nov-19	Nov-20	Mar-21
Predispatch P30/7DAY	Aug-18	-	Oct-18	Nov-18	Oct-18	Feb-19	-	Nov-19	Nov-20	Mar-21
Predispatch P5	Nov-18	Oct-18	Nov-18	TBC	TBC	TBC	-	TBC	Nov-20	May-21
Trading Price / Price Revision	Aug-18	-	Feb-19	Nov-18	Mar-19	Jul-19	-	-	Nov-20	May-21
Administered Pricing and CPT	Aug-18	-	Feb-19	Dec-18	Mar-19	Jul-19	-	-	Nov-20	May-21
Suspension Pricing	Sep-18	-	Feb-19	Dec-18	Mar-19	Jul-19	-	-	Nov-20	May-21
Negative Residue Management	Sep-18	-	Feb-19	Dec-18	Mar-19	Jul-19	-	-	Nov-20	May-21
Full Data Model	Sep-18	Feb-19	Mar-19	Mar-19	Mar-19	Jul-19	Oct-20	-	Nov-20	May-21

System Workstream – Settlement and Operations

- Current estimated timeline

5 MINUTE SETTLEMENT SYSTEMS TRACKING	TIMING									
	Internal HLIA	Focus/Group	SWG Engagement	External HLIA	Draft Tech Spec	Final Tech Spec	User Guides	Sandbox	Preprod	Production
SETTLEMENTS										
Estimation	Oct-18	Nov-18	Dec-18	Feb-19	Feb-20	May-20	-	-	Nov-20	May-21
Settlements	Oct-18	Nov-18	Dec-18	Feb-19	Nov-19	Feb-20	-	-	Nov-20	May-21
Reallocation	Dec-18	Nov-18	Dec-18	Feb-19	Aug-19	Nov-19	Feb-20	-	Nov-20	May-21
Billing	Oct-18	Nov-18	Dec-18	Feb-19	Dec-19	Mar-20	-	-	Nov-20	May-21
Prudentials	Sep-18	Nov-18	Dec-18	Feb-19	Apr-20	Jul-20	Sep-20	-	Nov-20	May-21
Full Data Model	Refer DISPATCH									
POWER SYSTEM OPS (TBC)										
PASA (ST/PD)	Aug-18	-	Oct-18		TBC	TBC	Oct-19	Nov-19	Nov-20	Mar-21
RERT	Oct-18	TBC	TBC		TBC	TBC	TBC	-	Nov-20	May-21
Negative Residue Management	Refer DISPATCH									

Stakeholder update

Chris Muffett

Stakeholder status

- Website
 - Consultation pages: provides a summary of key dates and material for each work package
 - Actions log: coordinates issues and actions coming out of the 5MS Program
<http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement/Program-Management/Actions>
- 1-on-1 discussions:
 - In to process of arranging next round of catch-ups
 - Feel free to contact us if you would like to arrange
- Fact sheets:
 - Next level of fact sheets (specific to participant roles) are being planned – to be delivered in March
- Resourcing
 - Currently recruiting resources to support the stakeholder engagement activities

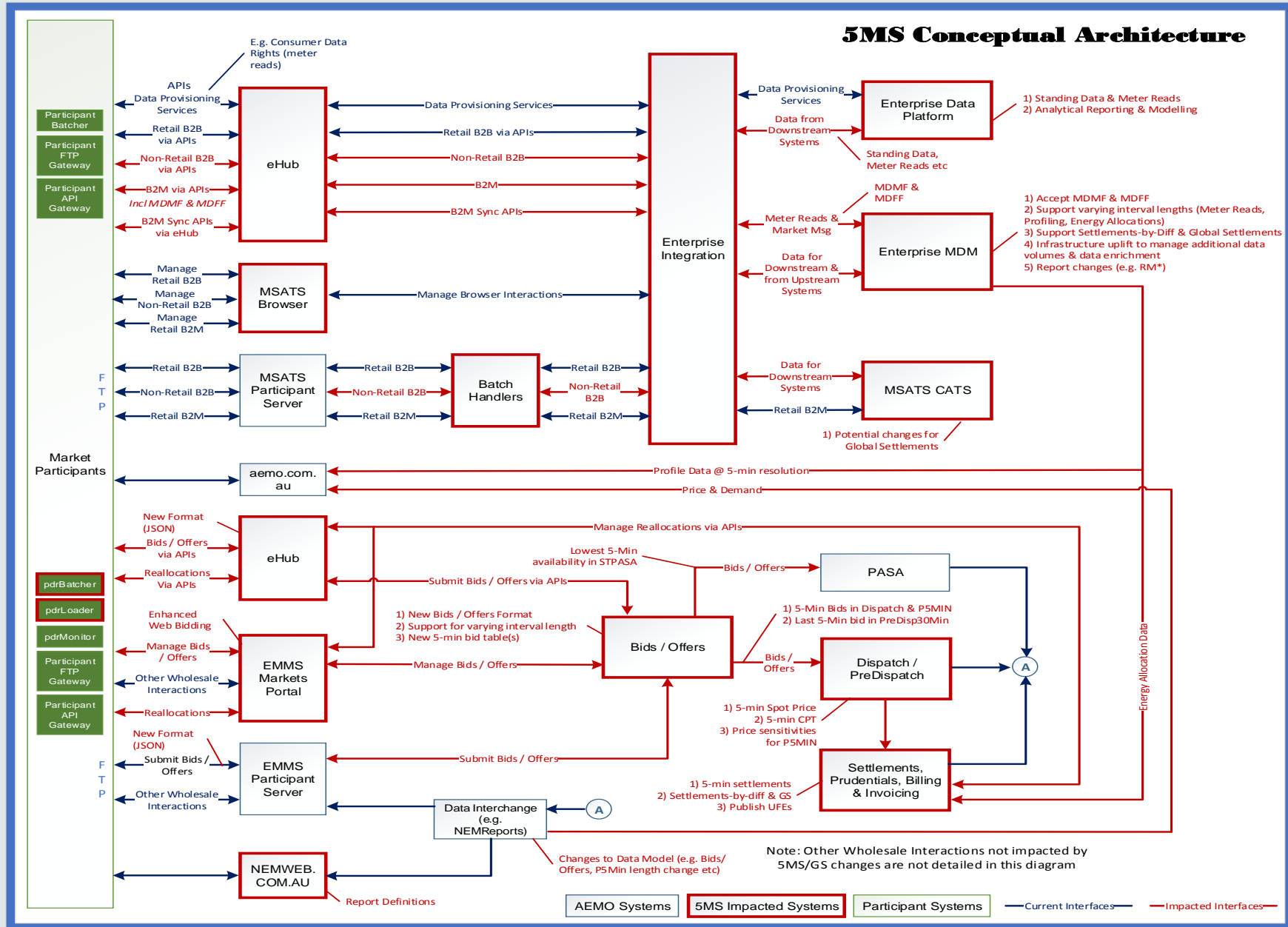
AEMO architecture for 5MS

Satheesh Kumar

5MS Architecture Overview

- Systems uplift (application, integration, data, infrastructure and security) to meet the
 - 5MS and GS Rule Change requirements
 - Non-functional requirements arising primarily due to increase in the volume of data (current and future volumes) and enriched data (e.g. MDFF data)
- Implement modern data exchange protocols (e.g. RESTful APIs) and formats (e.g. JSON) for the new functionalities and current functionalities where there are significant changes
- Provide support for legacy interfaces to support transition / contingency
- Provide an accompanying API where a significant change to a web application occurs
- Modern data exchange protocols over Internet

5MS Architecture On a Page



System Change Heatmap

NEM Retail System Changes

Market Interfaces

B2M MTRD

B2M via APIs

MDMT

Non-Retail B2B

MSATS Sync APIs

CATS

NMID

Retail B2B

VIC TUoS

MDM Processes

Meter Read Upload

AEMO Estimation

Profiling

Energy Allocation

UFE Calculations

CATS Processes

Standing Data

CR Processing

MSATS Browser / Reports

RM* Reports

PMS Reports

C* Reports

B2M Hub Queue
Screens

Meter Data Screens

NEM Wholesale System Changes

Dispatch Stream

Bids/Offers - API

Bids/Offers - FTP & UI

Data Model

Dispatch &
PreDispatch

EMMS Markets Portal

pdrBatcher

pdrLoader

Spot Price, Admin. &
Suspension Pricing

nemweb.com.au

Data Interchange

Constraints

Registration

Settlement Stream

Settlements by Diff &
Global Settlements

Reallocations

Estimation &
Prudentials

Data Model

EMMS Markets Portal

nemweb.com.au

Data Interchange

SRA

Causer Pay

Power System Stream

Negative Residue
Management*

STPASA

RERT*

Data Model

EMMS Markets Portal

nemweb.com.au

Data Interchange

MTPASA

Demand Forecasting

Wind/Solar
Availability

VAR/MW Dispatch

Update on non-mandatory components

Chris Muffett

Non-mandatory components

- Background:
 - At previous PCF meetings AEMO discussed a evolving list of items that are being considered as part of the 5MS program
- Status update:
 - The 3 metering components are no longer considered as optional components in light of GS final determination – AEMO has outlined a proposed approach in the draft determination for Metering package #1
 - Reallocation changes are being considered in light of feedback from Settlements Focus Group
- New items:
 - Item raised on alternative settlement approach, following suggestion from HydroTas in November Executive Forum
 - Item raised on profiling results, following discussions with Energy Queensland (and others)

Status update

	Component	Objective	Status
1	Unify meter data delivery	Decommission (after transition period) the existing B2M meter data format, and use same format as B2B and CAD (i.e. MDFF)	To be removed – AEMO has outlined the proposed approach in the draft report of Metering package #1
2	Register-level data streams for settlement	Allow import/export data to be provided for settlement activities (currently only net data is facilitated)	
3	Non-energy data streams	Allow non-energy (e.g. kVA) data to be received by AEMO	
4	Overhaul dispatch interface	Uplift the interface that scheduled participants use to provide bid/offer and related information	AEMO has sought feedback through the SWG and dispatch focus groups, and is proceeding on the basis of a technology change to the dispatch interface
5	Energy Storage System changes	Consider delivery of components of Energy Storage System work as part of 5MS	Still under consideration as to whether timing is suitable
6	Decommission sample meters	Remove requirement for NSPs to install/maintain sample meters to support controlled load profiles	Removed – AEMO will continue to support resolving this issue, but separately from 5MS
7	Reallocation changes	Consider what changes to reallocations should be incorporated as part of 5MS (e.g. 5-minute reallocations)	AEMO sought feedback through the Settlements Focus Group, and is currently considering the way forward

New items

	Component	Objective	Status
8	Alternative settlement approach	Explore opportunities to change the way 5-minute settlement is performed, to reduce impact on participant systems (raised by HydroTas)	AEMO is working with HydroTas to identify possible options and benefits
9	Profiling results	Explore opportunities to deliver more granular intermediate energy data, to reduce the need for participants to independently perform profiling, and improve ability to reconcile (raised by Energy Queensland)	AEMO is working with EQ to identify possible options and benefits – will seek guidance on arranging a targeted workshop on settlement reconciliation

General questions

Chris Muffett

Further information

- AEMO 5MS Program contacts:
 - Graeme Windley, 5MS Program Manager
 - Chris Muffett, 5MS Business Lead
 - Emily Brodie, 5MS Procedure Lead
 - Malcolm Borschman, 5MS Systems Lead
- Contact details:
 - 5MS email: 5ms@aemo.com.au
 - 5MS webpage:
<http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement>

Forward meeting plan

Chris Muffett

Upcoming meetings

- Program Consultative Forums:
 - PCF #8: Friday 8 March
- Next Executive Forum:
 - Wednesday 20 February
- Next Procedure Working Group:
 - Thursday 14 February
- Next Systems Working Group:
 - Monday 18 February
- Meetings and forum dates:
<http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement>

