



5 Minute Settlement & Global Settlement Vendor Briefing Session #3

16 September, 2020

Welcome and Introduction

Graeme Windley

Agenda

#	TIME	AGENDA ITEM	PRESENTER
1	10:00 – 10:05	Welcome and introduction	Graeme Windley
2	10:05 – 10:10	5MS and Global Settlement Rule Overview	Anne-Marie McCague
3	10:10 – 10:15	Program status overview	Rowena Leung
4	10:15 – 10:20	Systems and Technical Documents	Deborah Armenante
5	10:20 – 10:35	Key Systems Changes for 5MS and GS	Graeme Windley, Mark Hillaby, Ian Devaney & Jim Agelopoulos
6	10:35 – 10:45	Transition Plans	Greg Minney
7	10:45 – 10:55	Plan for Industry Test and Market Trial	Greg Minney
8	10:55 – 11:05	Approach to go-live plans	Greg Minney
9	11:05 – 11:15	Industry Risks and Issues	Graeme Windley & Anne-Marie McCague
10	11:15 – 11:30	Q&A Session on Functionality Deployment Matrix	Tui Grant
11	11:30 – 11:40	Industry Readiness	Greg Minney
12	11:40 -11:45	General Information Sources	Anne-Marie McCague
13	11:45 – 12:00	Questions	Graeme Windley

Purpose of this session

- To provide:
 - An update on the current status of the 5MS Program
 - An overview of industry testing
 - An introduction to the approach to transition
 - An opportunity for vendors to ask questions directly to the 5MS Program team

Meet the Team

- Rowena Leung – Program Director
- Graeme Windley - Senior Project Manager
- Ian Devaney – Dispatch Project Manager
- Jim Agelopoulos – Retail Project Manager
- Mark Hillaby – Settlements Project Manager
- Greg Minney, Readiness Manager
- Tui Grant – Test Manager
- Deborah Armenante – Senior Technical Writer
- Anne-Marie McCague, Stakeholder Manager

5MS and Global Settlements rule overview

Anne-Marie McCague

Background to 5MS & GS

The 5MS Program is implementing two AEMC rules for the wholesale electricity market – requires changes to metering, retail & wholesale, settlement, bidding and NEM operational systems.

Why, What & When

Expected benefits

5MS



- Settlement currently 30 mins, dispatch 5 mins.
- Settlement period will change to 5 mins.
- Commences 1 Oct 2021.

- Removes anomaly by aligning settlement & dispatch period – efficiencies for NEM operations & investments, supports orderly bidding.
- Better **price signal** for demand response, and for investment in **fast response technologies** (e.g.: batteries, gas peaking generators).

GS



- Unaccounted for Energy (UFE) is currently charged to a limited number of 'local retailers'.
- With GS, all retailers share the cost of UFE.
- UFE published by AEMO from 1 Oct 2021.
- GS commences 1 May 2022.

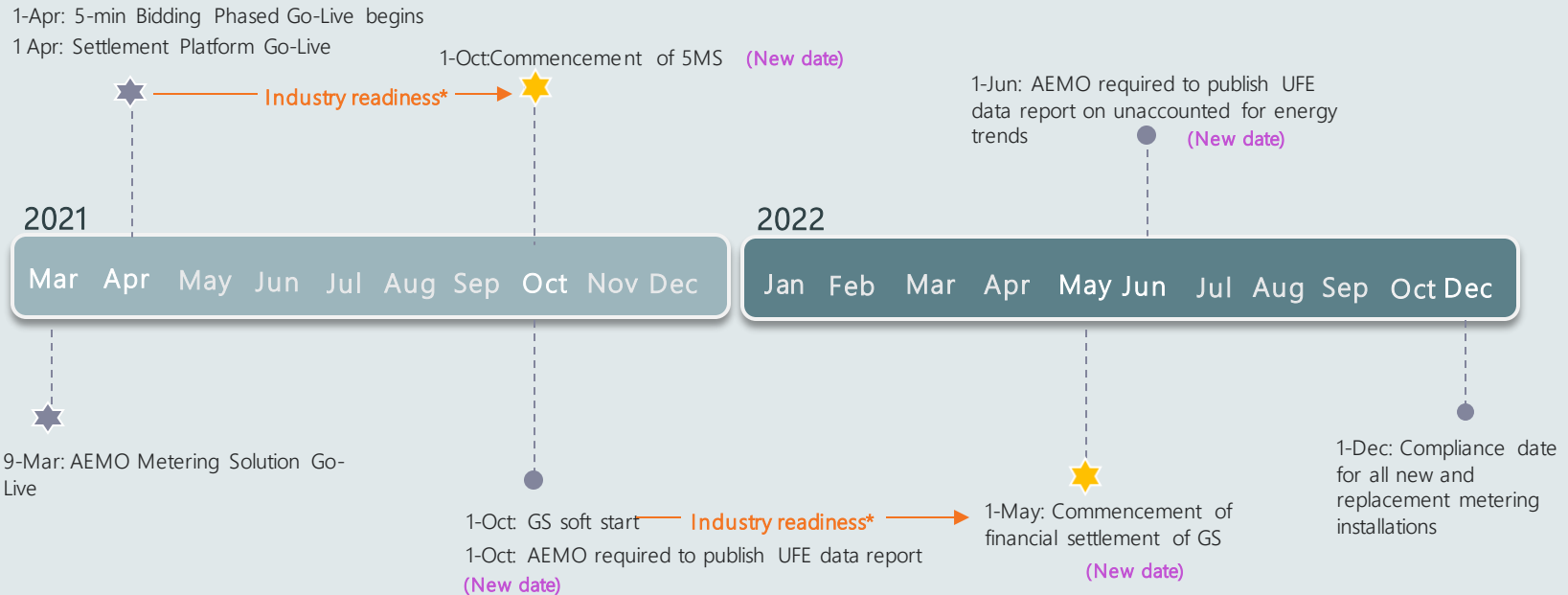
- Improved transparency, fewer settlement disputes and lower levels of UFE over time.
- Competition on equal terms.
- Improved risk allocation, enhanced incentives.
- It's efficient to implement GS within the 5MS Program, as it affects the same systems.

AEMC Decision – three-month deferral

Activity	Original date	New date
Commencement of 5MS	1 July 2021	1 October 2021
Commencement of "soft start" GS	1 July 2021	1 October 2021
Commencement of financial settlement of GS	6 February 2022	1 May 2022
Compliance date for all new and replacement metering installations (other than excluded metering installations) to be configured to record and provide 5-minute data	1 December 2022	1 December 2022
AEMO required to publish UFE data report	1 July 2021	1 October 2021
AEMO required to publish UFE report on unaccounted for energy trends	1 March 2022	1 June 2022

AEMO's implementation program remains unchanged

The Program is committed to meeting the original dates it set for IT systems development and deployment to allow market participants extra time to prepare and test their systems ahead of the new Industry go live dates.



*Note: Industry readiness includes testing and market trials

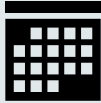
Further Information

- [AEMC webpage for 5MS](#)
- [AEMC webpage for GS](#)
- [AEMC webpage for 5MS and GS implementation amendments](#)
- [AEMC webpage for delayed implementation](#)

Program status overview

Rowena Leung

Program update and current activities



AEMO program

- Overall Program remains Green trending down
- Milestones impacted by AEMC deferral decision have been re-baselined
- Key L1-13 core functionality milestone was completed at the end of Aug, pressures remain with a very busy schedule.
- Focus of the program is now on testing with all 3 workstreams in SIT.
- AEMO business readiness, change mgt and cutover activity has also commenced.



Systems

- Deployment for 3rd Staging drop for Retail in progress (verbal update to be provided).
- Dispatch and Settlements System Testing completed. System Integration Testing is on track, target completion early October.
- Defect fixing, fine tuning and solution optimization will continue.

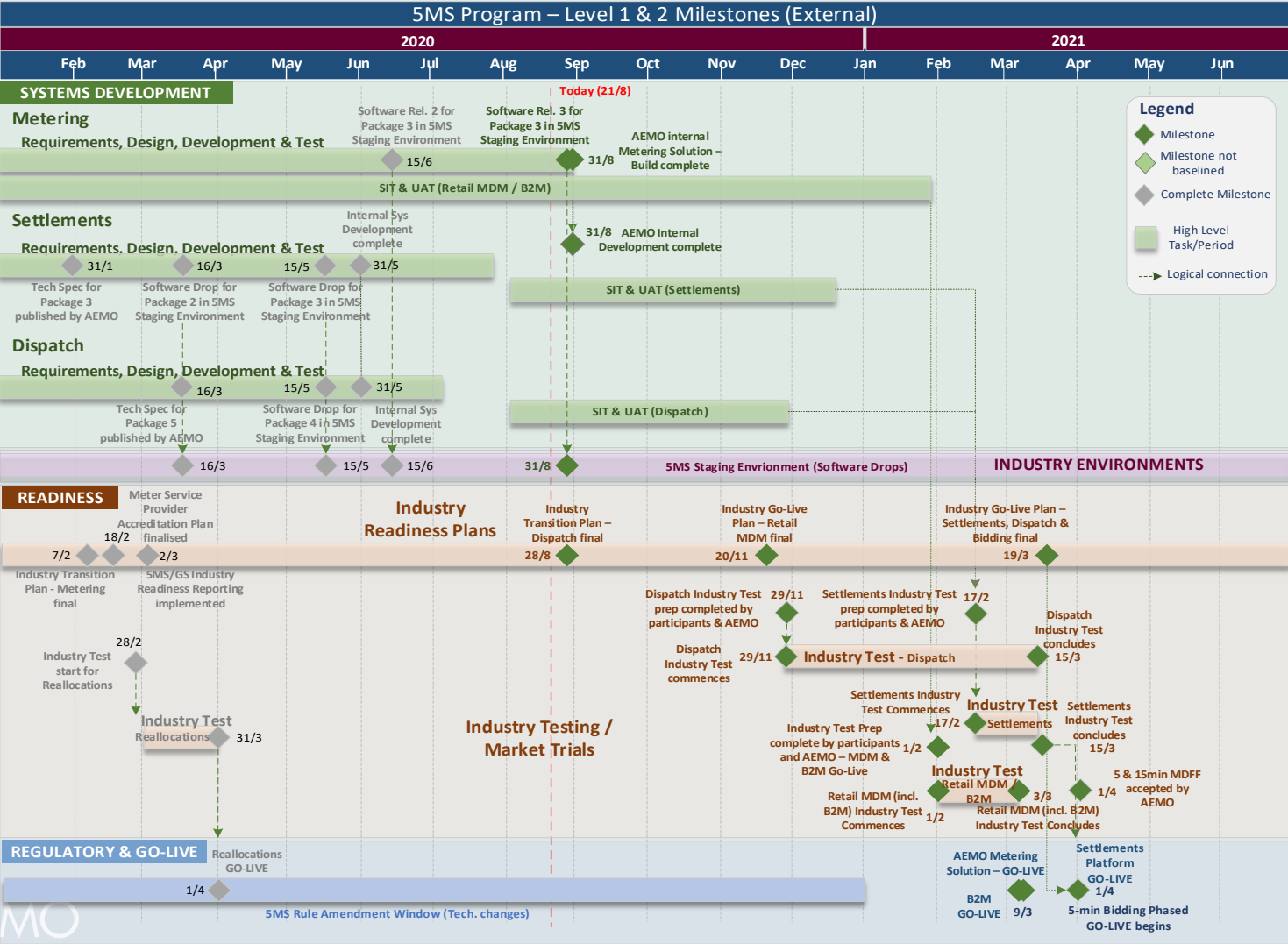


Readiness

- Industry Readiness Survey #3 conducted with 42 organisations providing responses. Report to be provided 3rd September
- Metering Transition Plan updated for 3 month deferral following input from TFG and endorsement at RWG
- Bidding Transition Plan finalised following industry consultation

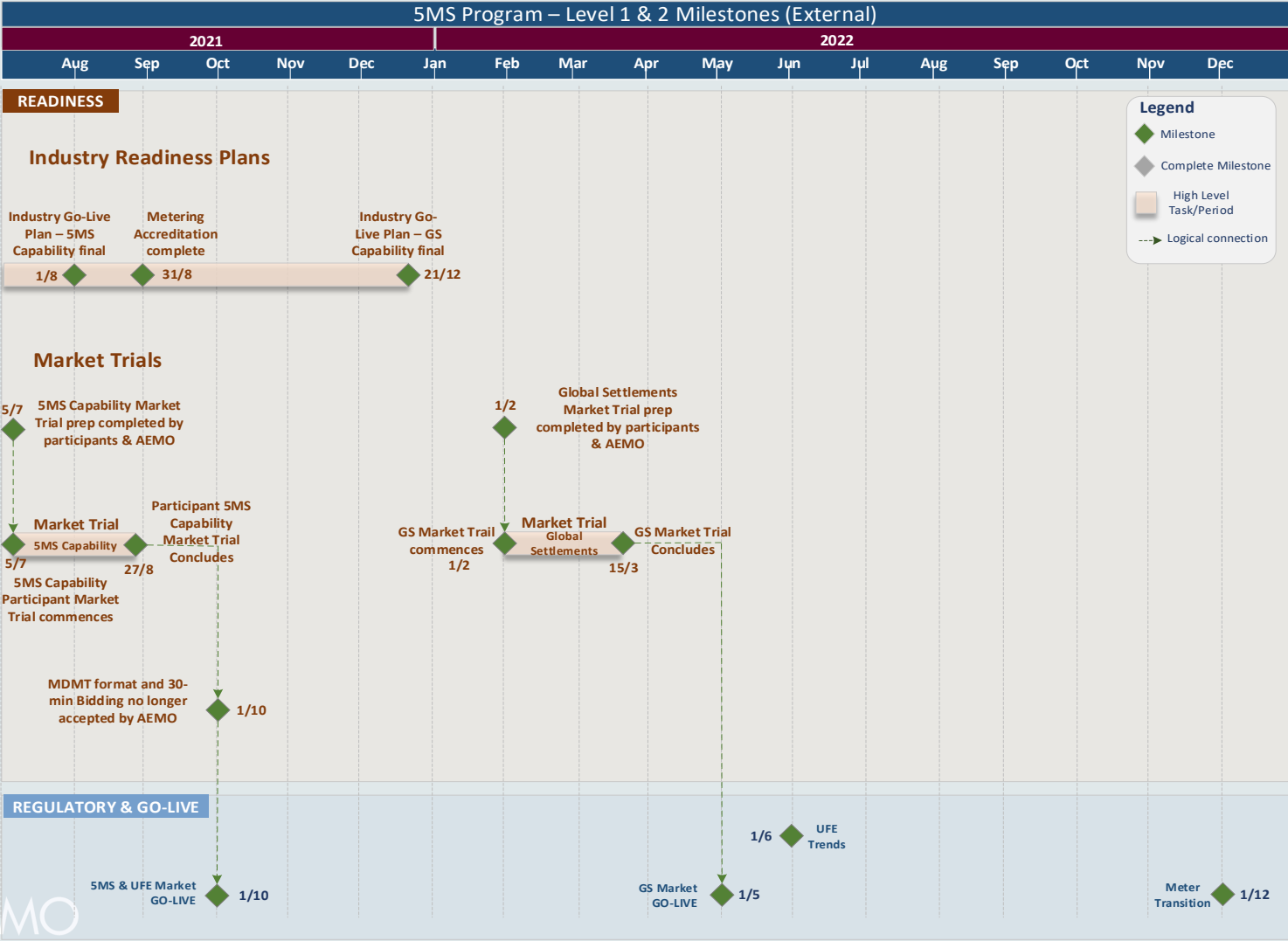
5MS Program Timeline

Level 1 and External Level 2 Milestones 1 / 2



5MS Program Timeline

Level 1 and External Level 2 Milestones 2/2



Systems and Technical Documents

Deborah Armenante

Systems Technical Documents

<https://aemo.com.au/initiatives/major-programs/nem-five-minute-settlement-program-and-global-settlement/systems-workstream/systems-technical-documents>

Hi-level Impact Assessment

Assessment of the changes market-facing systems

[5MS Systems High-Level Impact Assessment \(HLIA\)](#)

Dispatch and Operations

- [EMMS 5MS Technical Specification - 5MS - Dispatch and Operations](#): changes for Dispatch and Bidding.
- [Format and Validation for Energy, FCAS, and MNSP Bids and Offers](#): describes the file format for energy, FCAS, and MNSP Dispatch bids and offers.
- [Guide to Energy and FCAS Web Bids](#): describes the Dispatch web bidding interface.
- [Guide to API Energy and FCAS Bids and Offers](#): how to build Dispatch bidding APIs.

Systems Technical Documents

Meter Data

- [MSATS 46.98 Technical Specification - 5MS - Meter Data](#): changes for Meter Data.
- [Guide to NEM Retail B2M APIs](#): how to build B2M APIs.
- [MDFF Specification NEM12 and NEM13](#): describes the MDFF format to support 5-minute meter data.
- [MDM File Format and Load Process](#): specifies the MDM format used by MDPs to provide Metering Data.
- [Meter Data Validation Matrix](#): describes B2M validation.
- [Guide to MSATS and B2B Terms](#): explains B2M and B2B terms.

Coming soon for MSATS

- [Guide to MSATS Web Portal](#): how to use the MSATS web interface.
- [Technical Guide to MSATS](#): A new guide which is a supplement to the MSATS B2M procedures, providing an understanding of MSATS functionality and business rules

Systems Technical Documents

Settlements and Prudentials

- [EMMS 5MS Technical Specification - 5MS - Settlements](#): changes for Settlement systems.
- [EMMS 5MS Technical Specification - 5MS - Prudentials](#): changes for Prudential systems.
- [Guide to Reallocation APIs](#): how to build Reallocations APIs.
- [Guide to Electricity Reallocations](#): how to use the Reallocations web interface.
- [Guide to Settlements Direct](#): how to use the Settlements publishing system.
- [Guide to NEM Prudential Dashboard](#): explains the prudential dashboard web interface.
- [Guide to NEM Prudential Forecast](#): explains the prudential forecast web interface.
- [Guide to NEM Credit Support](#): explains the credit support web interface.

Systems Technical Documents

Data Interchange and Data Model

- [EMMS Technical Specification - 5MS - Data Model v5.00](#): changes to participants' Data Interchange (DI) environments.
- [Guide to setting up Data Interchange](#): how to set up a DI environment.
- [Guide to upgrading Data Interchange](#): how to upgrade a DI environment.

New online DI help

All DI documents in an online searchable format. Published Wed 23 September: www.aemo.com.au/www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/data-nem/nemweb-help

Other guide updates

- [Guide to User Rights Management](#): assists participant admins to provide access to AEMO's IT systems.
- [Connecting to AEMO's IT systems](#): assists participants to connect to AEMO's IT systems.

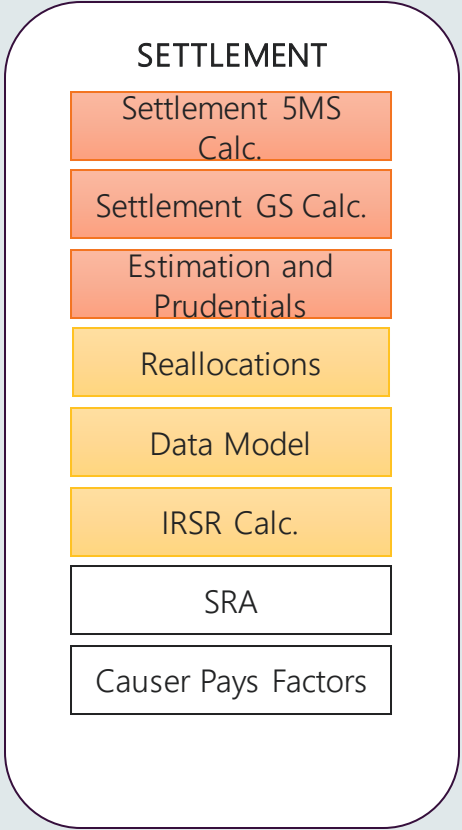
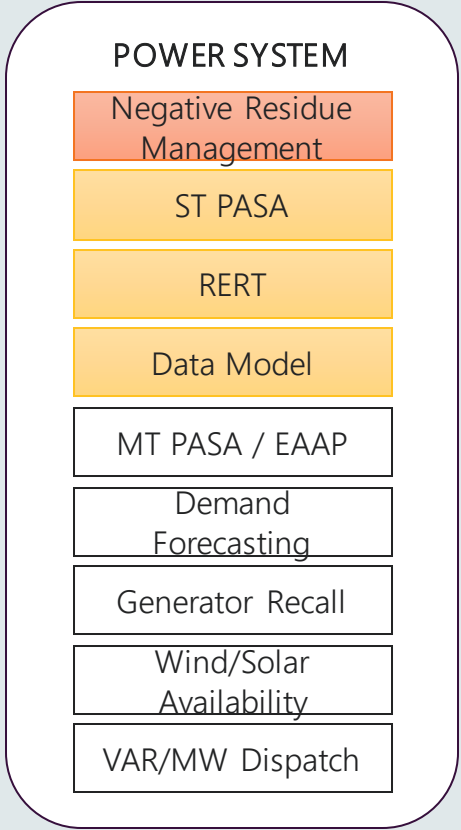
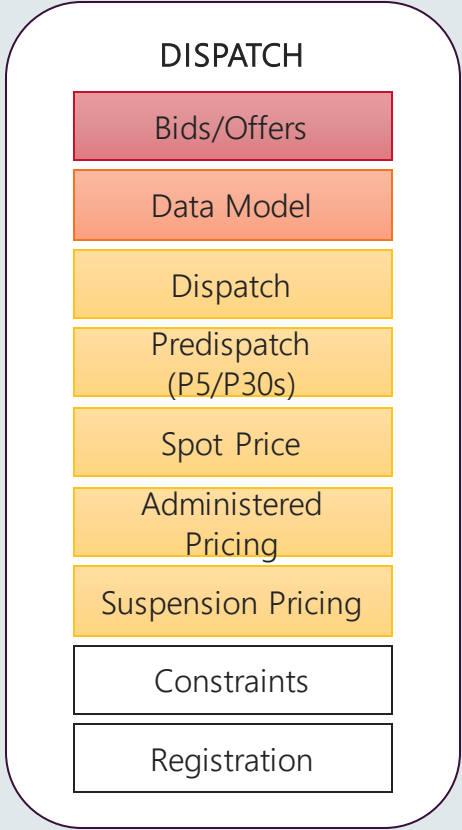
Key Systems Changes for 5MS and GS

Graeme Windley, Ian Devaney, Mark Hillaby & Jim Agelopoulos

Program Scope (Systems Focus)

	Dispatch	Metering	Settlements
Systems Workstreams	Function Manages demand forecasting and the dispatch price every 5-minutes (and aggregates spot price every 30 minutes). Ensures electricity demand is met.	Function Manages receipt and storage of market data (metering and standing data). Metering prepares data for market settlement and enables market reporting.	Function Manages the calculation of financial liabilities and credits between market participants daily and settles all trade in the NEM on a weekly basis.
	Scope of change <ul style="list-style-type: none"> • Increase daily bidding intervals from 48 to 288. • New data structures required to receive, use and store five-minute bids and offers. • Changes required to calculate the floor price and price cap. • AEMO to publish five-minute data. 	Scope of change <ul style="list-style-type: none"> • Enable receipt of metering data every 5 minutes. • Enable management of >2 trillion data points by 2028. • Change profiling algorithms to derive 5 minute energy data. • Enable energy allocation to be at 5, 15 and 30 minute intervals. 	Scope of change <ul style="list-style-type: none"> • Enable settlement on 5 min granularity, 5 min price, and Marginal Loss Factors (MLF) • Settlement estimations will calculate energy transactions per 5 min period. • Additional calculations (i.e. market ancillary services, FACS), to be calculated with 5-minute data
	Solution Path Enhance Legacy Systems	Solution Path Build New Solution using Strategic Technologies	Solution Path Enhance Legacy Systems
Remainder 5MS & GS Program	Program Management		
	Market Procedures, Stakeholder engagement and market/industry readiness		
	Process Mapping, Change and Training, Cutover and Transition		
	Infrastructure / External Web Development / Internal webMethods Integration		

NEM Wholesale System Change Heatmap



NEM Retail System Change Heatmap

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

Transition Plans

Greg Minney

Transition Approach

Transition Approach:

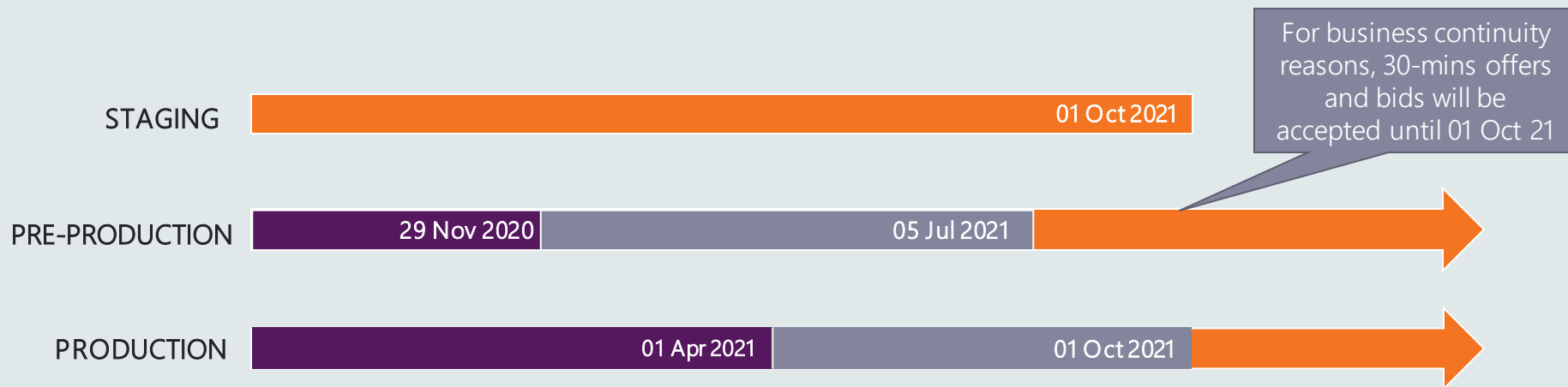
- Staged introduction of capability leading up to market commencements for both 5MS and GS
- Platform implementation followed by 5MS and GS capability activation
- Industry Test phases for participant confirmation of business interaction under new market procedures
- Criteria for AEMO and Participant readiness ahead of Rule Commencements

Participant Vs Vendor Scope:

- Participant scope and timeframes to address their program timeframes
 - Advise from AEMO is Participant timeframes are likely to differ to AEMO timeframes
 - Participant scope includes internal requirements for system upgrade and build

Bidding / Dispatch

Staging, Pre-production & Production timelines

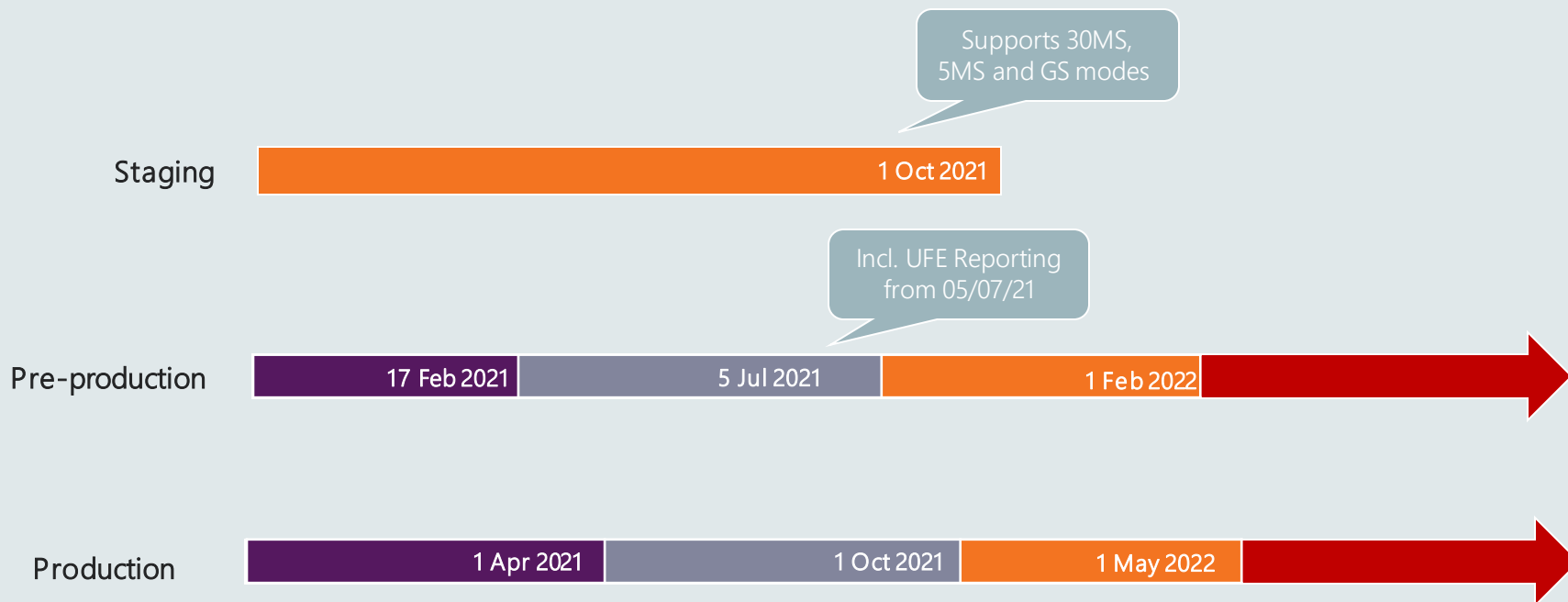


LEGEND

LEGACY	BIDDING TRANSITION	5MS RULE
30-minute bidding only via: <ul style="list-style-type: none"> FTP (txt) Web Bidding (Legacy) 	30-minute bidding via: <ul style="list-style-type: none"> FTP (txt) Web Bidding (Legacy) 5-minute bidding* via: <ul style="list-style-type: none"> FTP (JSON) Web Bidding (5MS) API <i>*Each 5-minute bid within each half hour must be identical, giving the same effect as the submission of a 30-minute bid.</i>	5-minute bidding* only via: <ul style="list-style-type: none"> FTP (JSON) Web Bidding API <i>*30-minute bid emulation restriction lifted</i>

Settlements

Staging, Pre-production & Production timelines

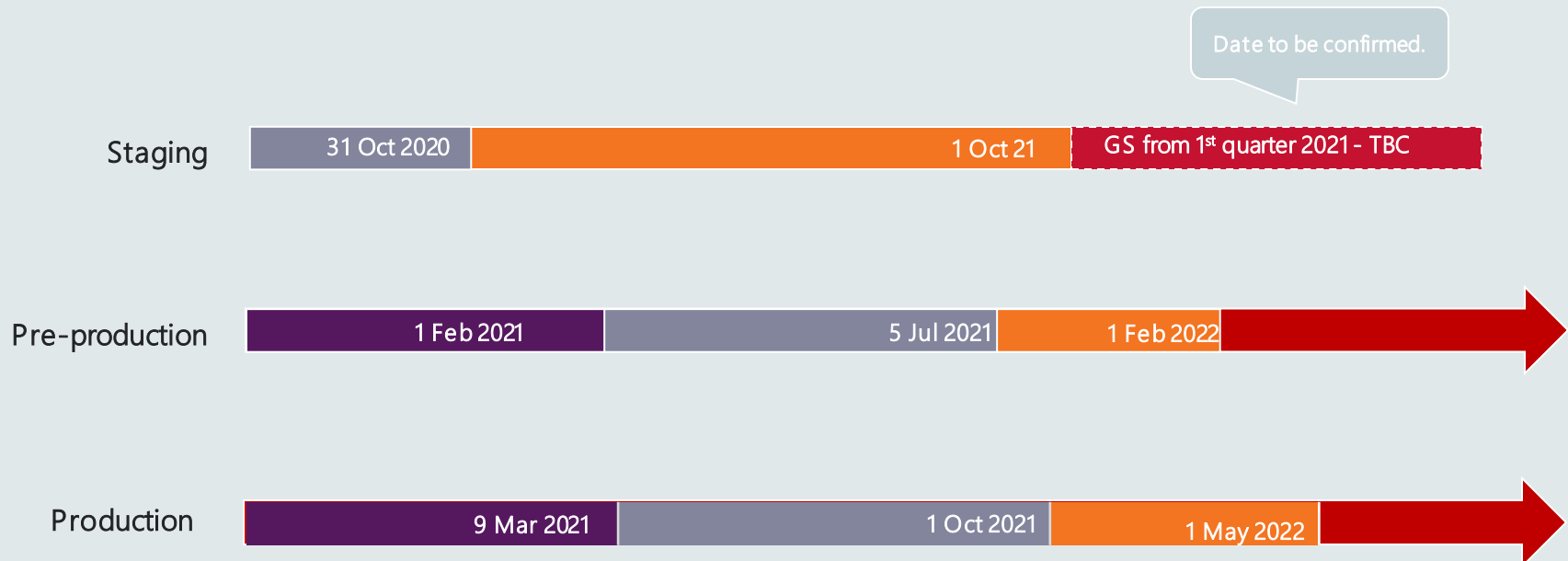


Legend

Legacy	New Settlement Platform	5MS Rule	GS Rule
30-minute Settlements	30-minutes settlement to 1 October 2021	Five-minute settlement and Global Settlement soft-start - UFE Reporting	All Retailers become liable for UFE

Retail Metering

Staging, Pre-production & Production timelines



Legend

Legacy	30MS with new platform	5MS Rule	GS Rule
30-minute meter reads	30-min settlement 5-min reads supported Standing data updates for GS	UFE calculation and 5-min settlement	LR updated to GLOPOOL

Plan for Industry Test and Market Trial

Greg Minney

AEMO 5MS Testing Environments

- 5MS Staging Environment
 - Provide software to enable early testing of functionality by participants
 - Environment is not fully integrated e.g. PAE runs to Settlement Statements
 - MSATS data will be refreshed on 31 August 2020 with production data as at 30 July 2020
 - Environment support for 30MS, 5MS, GS modes of operation over time
- AEMO pre-production environment (pre-prod)
 - Used for all market trials and formal industry testing
 - Reflects production capability – and capability for upcoming release during market trial and industry test period
- Functionality Deployment Matrix highlights functionality supported in test environments with planned release dates

Participant Testing Types

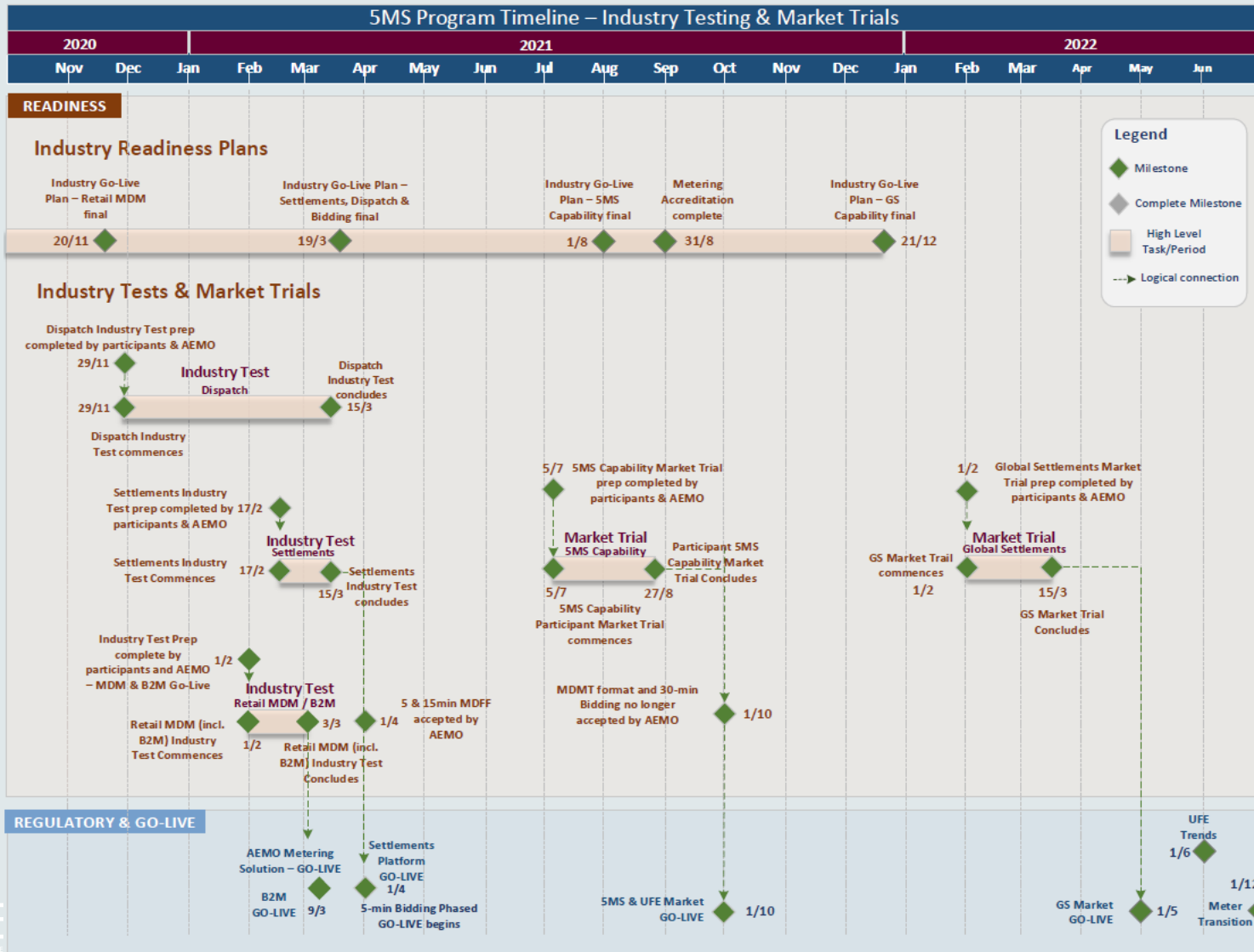
- There are three types of participant testing:

Type	Definition	Environment	Example
Industry Testing	Self-testing of functionality such as connectivity, and/or coordinated multiparty testing of functional scenarios	Staging, pre-prod	Testing a change request (CR) or processing a reallocation
Market Trial	AEMO coordinated multi-party end-to-end testing of business process scenarios	Pre-prod	Meter exchange involving CRs, services orders and 5-minute meter reads
Invitation Industry Testing	AEMO coordinated testing of business process scenarios with a select number or subset of participants with systems ready for testing.	Pre-prod	Testing NMI transfer Process

- Approach to participant testing was developed in consultation with industry and is captured in the Industry Test and Market Trial Strategy

5MS Program Timeline

Level 1 and Level 2 Milestones relating to Readiness and Participant Testing



5MS and GS Industry Test and Market Trials

- Industry Test and Market Trials strategy updates to reflect Industry Deferral
- Testing to support platform go-lives as currently planned
- Timings for Market Trials for 5MS and GS shift in alignment with new rule commencements
 - 5MS market Trial 5/7/21 → 27/08/21
 - GS Market Trial 1/2/22 → 15/03/22
- GS Market Trial dates avoid market trial over Christmas period
- Separate market trials proposed for 5MS/ UFE reporting capability and GS to allow for industry population of required standing and tier 1 metering data

Further Reading

- [Industry test and market trial strategy](#)
- [Industry Testing Working Group meeting packs and notes](#)
- [5MS Staging Environment webpage](#)
- [Participant testing webpage](#)

Approach to go-live plans

Greg Minney

Approach to go-live plans

- For each of the platform go-lives and industry go-live plan will be developed in consultation with the Readiness Working Group
- In line with staged transition approach, AEMO platforms will be deployed on “like for like” basis to minimise participant dependencies:
 - Participant upgrades will be scheduled in line with individual participant timeframes
- Production outages will be minimised to support ongoing Business operations

Scope of Industry go-live plans

In scope

- High level transition and cutover approach
- Industry responsibilities and expectations, including connectivity testing
- AEMO Platform deployment proceed decision criteria and timeframes
- Industry Cutover schedule
- Communication and notification plan
- Contingency and restart process and notification

Out of scope

- Participant deployment approaches
- Participant roll-back plans



Industry Risks and Issues

Graeme Windley and Anne-Marie McCague

Managing Industry Risks and Issues

- The 5MS Program maintains an Industry Risks and Issues Register with the 5MS Working Groups
- The Program Consultative Forum (PCF) is the overall owner of the register and reviews it at least on a quarterly basis
- Each Working Group identifies and manages risks and issues
- The register is available on the [5MS website](#)
- The purpose of this section is to high-light the risks that may impact vendors

Risk of “Big Bang”

ID	Risk Description	Residual Rating	Mitigation
R04	<p><u>AEMO Big bang approach</u> AEMO systems for bids/offers and meter data all going live at once on 1 Oct 2021, results in a failure of go live.</p>	Significant	Early, staged deployment approach SMS Staging Environment AEMO Readiness Reporting
R17	<p><u>Industry 'big bang' approach</u> Potential for Participant systems to fail at go-live due to insufficient transitional provisions e.g. market trial participation and staged system implementation resulting in market disruption (meter data flows and standing data flows)</p>	Significant	Transition Strategy Metering Transition Plan Bidding Transition Plan Industry Test and Market Trial Strategy Industry Readiness Reporting

AEMO Systems Deployment Cutover Risk

ID	Risk Description	Residual Risk Rating
R28	<p>The current Cutover approach has the 3 AEMO systems deployments in close succession. Retail Metering the largest, most technically complex and riskiest cutover going first on 9 March, then followed by both the Dispatch and Settlements systems deployments together 3 weeks later on 1 April.</p> <p>A go-live criteria for Settlements is a stable metering platform. The current timetable only allows one week for the Retail solution to be stabilised prior to commencing cutover activity for Settlements which is high-risk.</p>	Medium

- To mitigate this risk AEMO is proposing to move the Settlements go-live to **19 April 2021**
- Settlements deployment into pre-production remains 17 February 2021
- The Dispatch and Retail Releases are required to facilitate 5MS market go live transitional activities (i.e. submit 5-min bids; deliver 5-min reads).
 - go-live dates, pre-prod dates and transition plans remain as is (9 March 2021 for Retail and 1 April 2021 for Dispatch)
- The Settlements solution platform go-live does not facilitate any 5MS industry go-live or transitional activities – it only must be deployed in Prod before 1 October 2021

Non-5MS Market changes not reflected in the 5MS Staging Environment

ID	Risk Description	Inherent Risk Rating	
R31	There is a risk that market changes from projects other than the 5MS and GS implementation that go-live during the extended 5MS and GS transition period will not be reflected in the 5MS Staging Environment which could mean that it is not an effective environment for participant testing.	Significant	This is being reviewed as part of the work on interactions with other market changes and 5MS Staging Environment and will be discussed with ITWG. Mitigation measures to be determined and risk to be updated with residual risk rating.

- AEMO has carried out a review of the [Regulatory Implementation Roadmap](#) in consultation with industry
- The updated roadmap takes into account a number of recent AEMC decisions including the 3-month deferral for 5MS and GS
- AEMO is currently reviewing the interdependencies between the 5MS Program, Customer Switching and Wholesale Demand Response (WDR) and will communicate to participants through joint information session

Q&A session on Functionality Deployment Matrix

Tui Grant

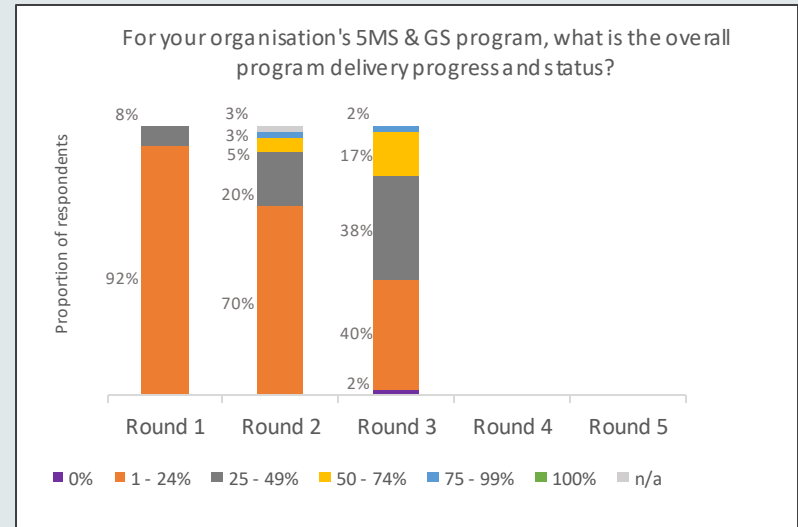
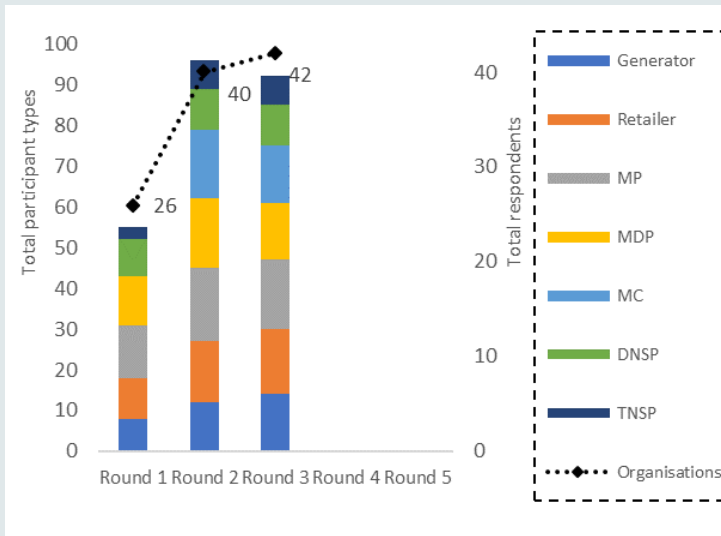
Functionality Deployment Matrix

- Functionality Deployment Matrix demo
- Q&A Session
- Matrix can be found on the 5MS website here:
<https://www.aemo.com.au/-/media/files/electricity/nem/5ms/program-management/aemo-5ms-functional-deployment-matrix.xlsx?la=en>

Readiness Reporting

Greg Minney

Readiness Reporting



Participant Response

Participant Progress

Readiness Reporting:

Regular survey of participant (and AEMO) progress towards 5MS and GS commencements

Provides consolidated assessment of Industry readiness and basis for individual participant comparison

Participant assessment of readiness:

- Overall program status, including vendor provision
- Role specific criteria
- Metering transition activity

Industry risks and responses

General Information Sources

Anne-Marie McCague

5MS Website

- Links to the Working Group pages available in diagram on [main page](#)
- [Participant implementation](#) section added to provide guidance for:
 - Metering participants
 - DNSPs
 - Retailers
 - Generators
- The following tools are available on the [Program Management webpage](#):

Program Management Tool	Update Cycle
Program actions log	monthly
5MS Program document tracker	as necessary
Industry risks and issues register	as agreed with PCF and reviewed at least quarterly
5MS Functionality Deployment Matrix	as necessary
Program timeline	monthly

Upcoming meetings

<https://aemo.com.au/initiatives/major-programs/nem-five-minute-settlement-program-and-global-settlement>

Current as 14 Sep 2020

SEPTEMBER

Su	Mo	Tu	We	Th	Fr	Sa
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	1	2	3

OCTOBER

Su	Mo	Tu	We	Th	Fr	Sa
27	28	29	30	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

NOVEMBER

Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5

Forums/Working Groups
Executive (EF)
Program Consult. (PCF)
Procedures (PWG)
Systems (SWG)
Readiness (RWG)
Industry Testing (ITWG)

Focus Groups
Dispatch
Metering
Settlements
Transition
Reconciliation
Contingency
Industry Testing

Other
Information sessions
Q&A session
National Public Holiday
State Public Holiday*

*Relevant state has been marked in a comment. WA, NT, TAS, ACT holidays have not been

Questions?

Appendix: 5MS Architecture

5MS Architecture On a Page

