

# Five-Minute Settlement Program: Executive Forum 4

AEMO 5MS Program Team

WEDNESDAY 20 FEBRUARY 2019

AEMO OFFICES:

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# Agenda

NO	TIME	AGENDA ITEM	RESPONSIBLE
<b>Preliminary Matters</b>			
1	2:00pm – 2:05pm	Welcome, introduction and apologies	Peter Geers (AEMO)
2	2:05pm – 2:10pm	Minutes and actions from previous meeting	Peter Geers (AEMO)
<b>Matters for Noting</b>			
3	2:10pm – 2:30pm	Program update <ul style="list-style-type: none"> <li>• 5MS program status</li> <li>• Industry risks &amp; issues</li> </ul>	Graeme Windley (AEMO)
<b>Matters for Discussion</b>			
4	2:30pm – 3:30pm	5MS implementation approach and cost recovery: <ul style="list-style-type: none"> <li>• Technology approach</li> <li>• Industry impact</li> <li>• Industry benefits</li> </ul>	Joe Locandro (AEMO) Peter Carruthers (AEMO) Peter Carruthers (AEMO)
<b>Other Business</b>			
5	3:30pm – 3:40pm	General questions	Peter Geers (AEMO)
6	3:40pm – 3:50pm	Forward meeting plan	Peter Geers (AEMO)

# Minutes and actions from previous meeting

Peter Geers

# Previous meetings

- Executive Forum met on Wednesday 13 November 2018
  - 1 action – Wally Borovac (HydroTas) and Peter Geers to discuss opportunities to reduce 5MS implementation costs
- Meeting pack and notes from meetings are published at:  
<http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement/Program-Management/Executive-Forum>

# Program update

Graeme Windley

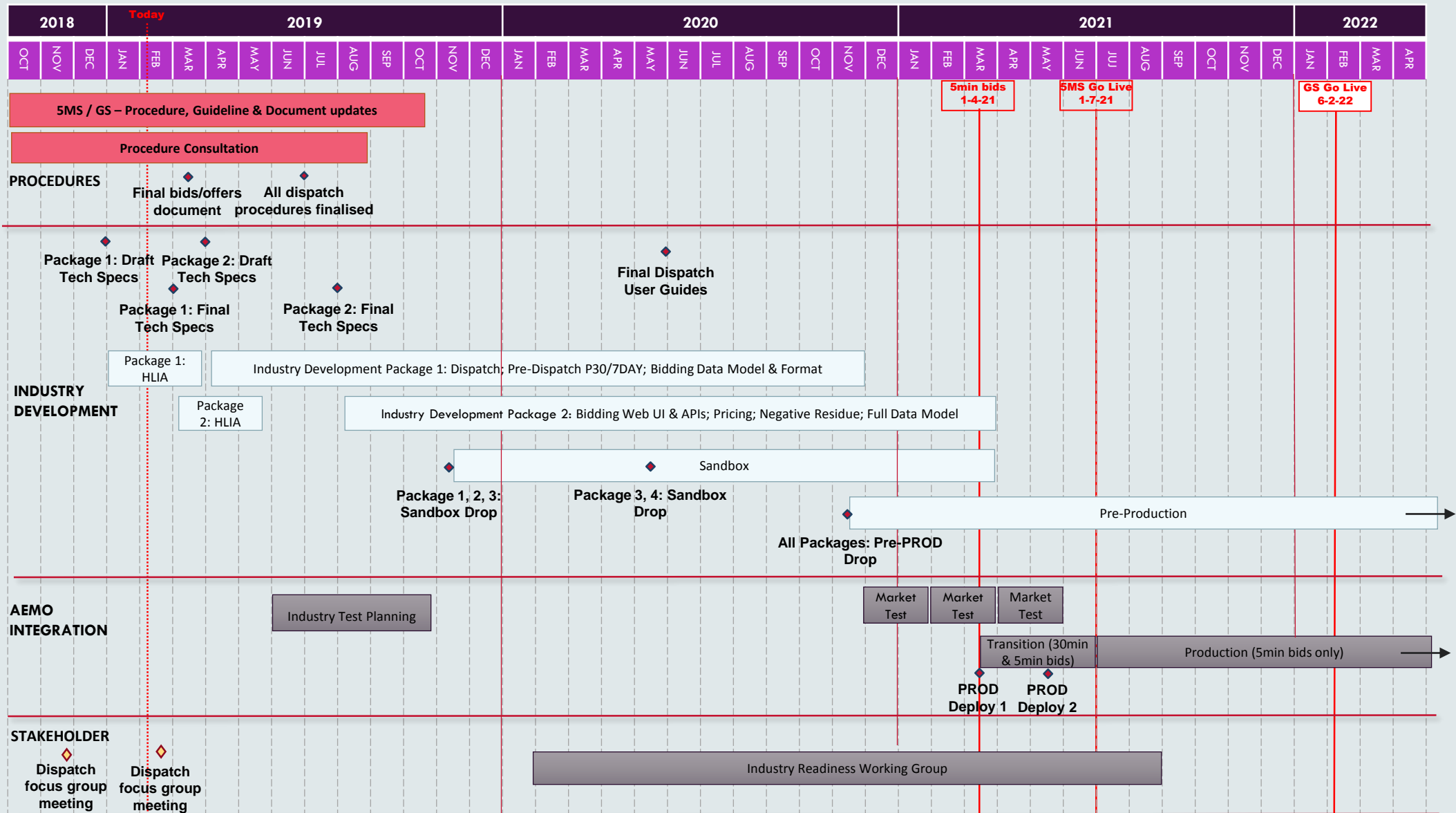
# 5MS Program status

- Global Settlements (GS)
  - Rule change approved by AEMC in December.
  - UFE reporting 1 July 2021; full GS methodology 6 Feb 2022.
- Procedures
  - 4/4 sets of draft procedures delivered for industry consultation on schedule .
  - 8 remain, all to be delivered by June 2019.
- Systems
  - Draft tech spec incl dispatch, pre-dispatch P30 & data model released on schedule.
  - Metering Tech Spec, incl MDFFF format, due April 2019.
  - Settlements engagement via SWG began Dec 2018.
- Readiness
  - Ramp-up to begin now, initial milestone view to PCF in Mar 2019
  - Target June 2019 for detail on market trails and phased cutover approach
- Program Consultative Forum
  - Meeting held on 8 February
- Industry Timeline
  - New approach to co-ordinate AEMO approach with participant activities
  - Feedback from Participants in progress

# 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

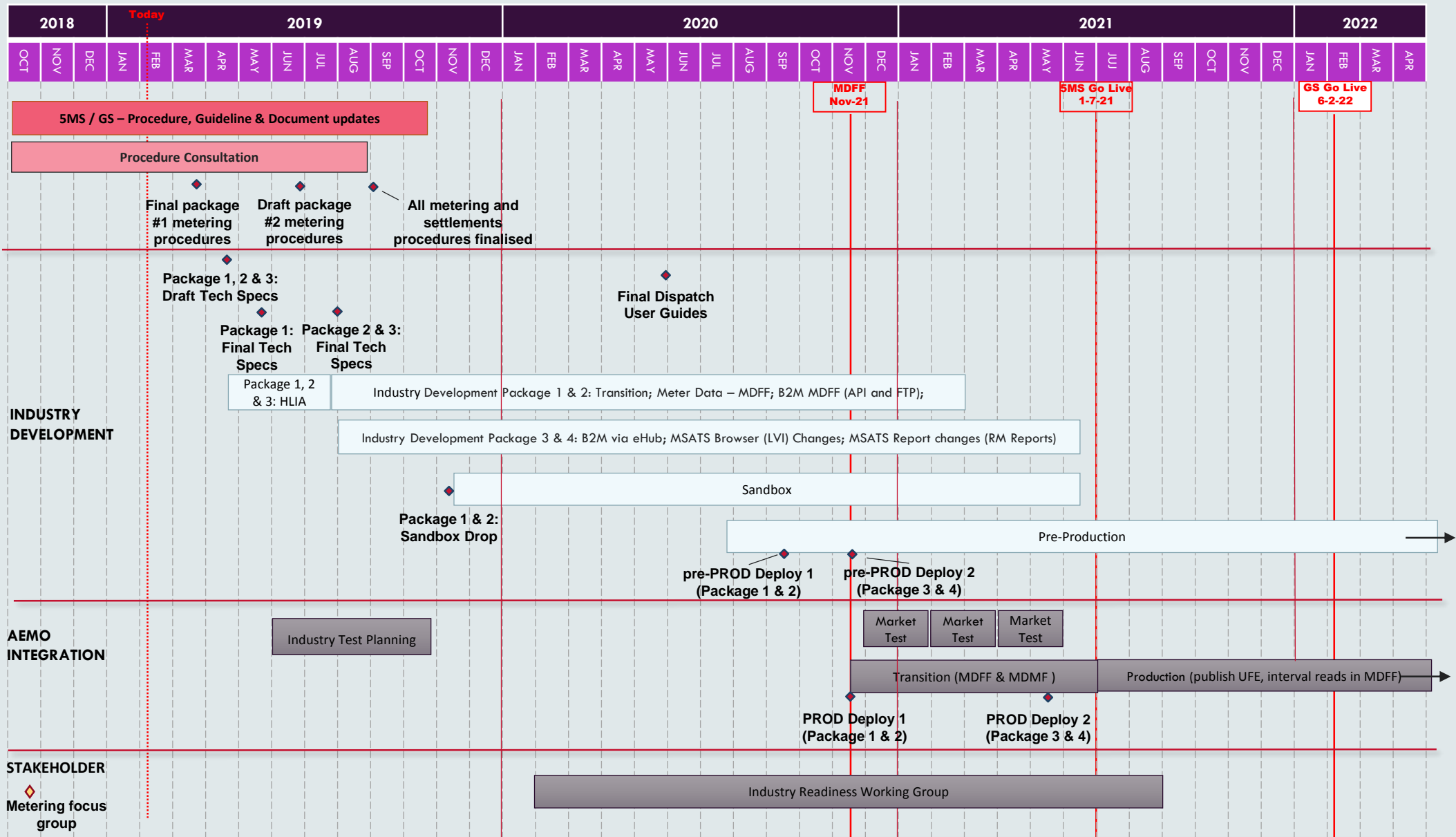
**Package 4\*:** RERT, Trading Price / Price Revision; Administrated Pricing and CPT; Suspension Pricing; Negative Residue Management; Full Data Model<sup>^</sup>

\* Dates TBC for External HLIA, Tech Spec and Sandbox

<sup>^</sup> 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 – MDFF; B2M MDFF (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);

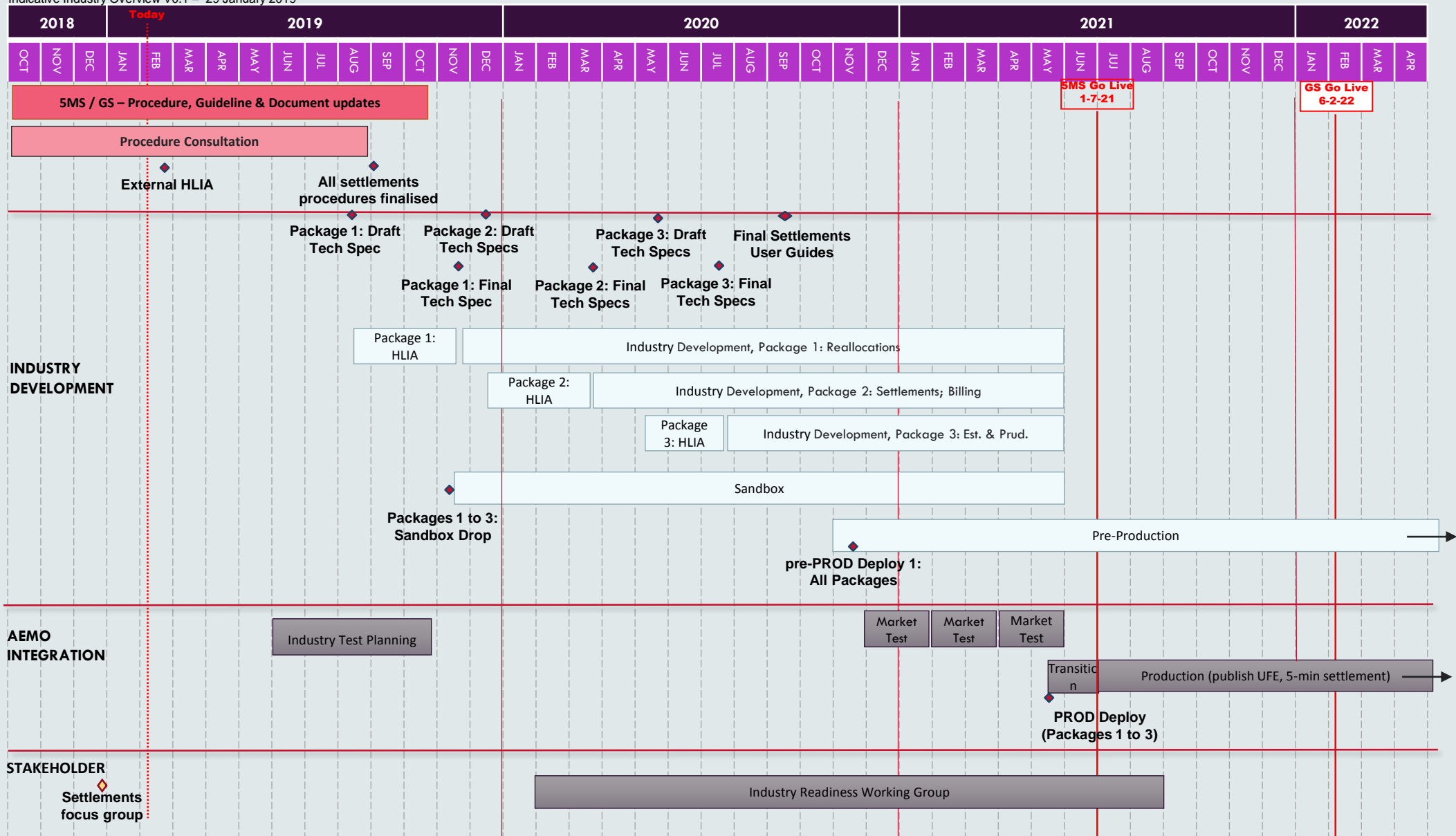
\* Dates TBC for External HLIA, Tech Spec and User Guides



# 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

# Industry risks & issues

- Risks & issues were reviewed by the PCF on 8 February
  - No new risks identified
  - 1 new issued identified – metering transition for December 2022
  - Proposed that risks be rated
- 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>

# 5MS implementation approach and cost recovery

# 5MS Re-cap

## AEMC - 5MS Consultation (2016-17)

- SunMetals submitted Rule Change in Dec 2015
- Series of consultations by AEMC with stakeholders through 2016/17
- AEMO noted implementation complexity and desirability of transition approach

## AEMC - 5MS Final Determination (Dec 2017)

- Policy work complete, stakeholder views considered, definition of change is clear
- Focus moves to execution
- AEMO established 5MS Project, allocated resourcing and initial funding
- Stakeholder forums defined and established
- Implementation options assessment commenced

## AEMO Execution (2018-today)

- Stakeholder forums up and running
- Procedures development and consultation well underway
- AEMO implementation options assessment and due diligence completed
- Noted Global Settlement final decision
- AEMO ready to seek Board approval for funding for major IT development project for 5MS & GS

# 5MS technology approach

Joe Locandro

# Existing legacy solutions

AEMO's existing  
metering and  
settlement solutions  
are at end-of-life

- A comprehensive process to review options and risks has been undertaken:
  - Continue to use legacy existing systems
  - Purchase Commercial of the Shelf (COTS) projects
  - Rebuild using strategic technologies
- AEMO's metering and settlement solutions were deployed 15-20 years ago, and the underlying technology has remained largely the same
  - Changes have been tactical of nature, increasing the wear on the systems, complicating the architecture and accruing significant technical debt
  - Multiple architectures exist across the same gas and electricity market capabilities AEMO manages
  - Due to complexity and legacy technology the systems are rigid and costly to maintain
- AEMO does not consider the option to invest further in existing systems to be prudent, given the increasing legacy risk, the critical nature of the systems and expected level of market change going forward

# Product Based Solutions

- Introduces an experienced partner to progress solution changes.
- Multiple vendors proposed technology uplifts as part of their proposals to ensure a sustainable metering solution.
- Considerable customisation required for all products to meet AEMO's requirements.
- The costs of all vendor proposals were high (implementation and operational licencing costs).

# Proposed approach

AEMO plans to rebuild the metering and settlement systems using modern technologies

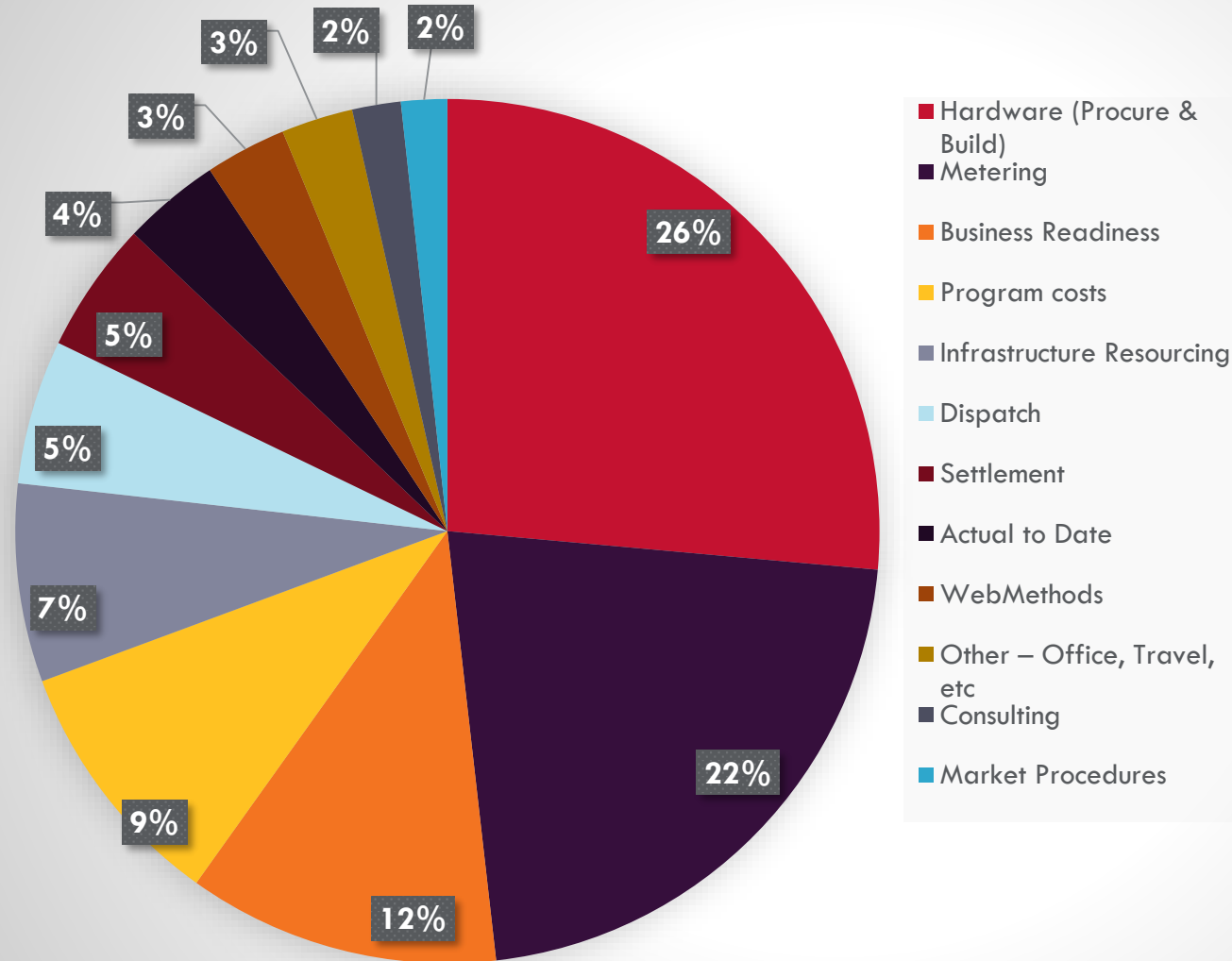
- AEMO will engage a System Integrator to assist with the development of a new metering system for:
  - Meter Data Management
  - Profiling and Energy Allocation
- AEMO will rewrite the settlement system on a modern supportable technology platform
- Existing dispatch systems will be retained and have a modern technology uplift
- Existing customer transfer solution (part of MSATS) does not require material changes for 5MS/GS and will be retained for the time being, but further work is being done to consider future options



# AEMO Costs

- Implementation Cost estimates
  - Total Cost of Ownership \$121m over 10 years
  - Takes account of capex, opex and financing costs
- Selected option is the lowest Total Cost of Ownership
  - Legacy systems upgrade and off the shelf solutions incur very high opex and licencing over time that pushes costs above the preferred option.
- Costs are a function of 5MS/GS changes and legacy systems replacement/uplift
  - Legacy systems replacement cost broadly estimated at \$50-60m
  - Efficiency benefits of performing these changes concurrently
  - Estimated by the Project Team as ~20-30%
- Rigorous process for Implementation Options Assessment undertaken
  - Options tested in the market
  - Estimates developed by subject matter experts and review process undertaken
  - Project Plan prepared, including timeline, solution, resourcing, etc
  - Other market operators contacted (noting direct like-for-like comparisons difficult)
  - Risks reviewed and assessed
- Normal cost management initiatives undertaken
  - Fixed price arrangements with vendor
  - Off-shoring for IT development work where appropriate
  - PMO cost monitoring and management

# Cost Breakdown



- Core functional workstreams are Metering, Settlements, Dispatch. Complexity of each application is high.
- Trading interval change is extensive eg Dispatch: 5 min bids as input to Dispatch, Pre-dispatch, PASA, administered/suspension pricing; all screens
- IT technology and infrastructure are significant
- Considerable effort allowed for Business Readiness

# Industry impact

Peter Carruthers

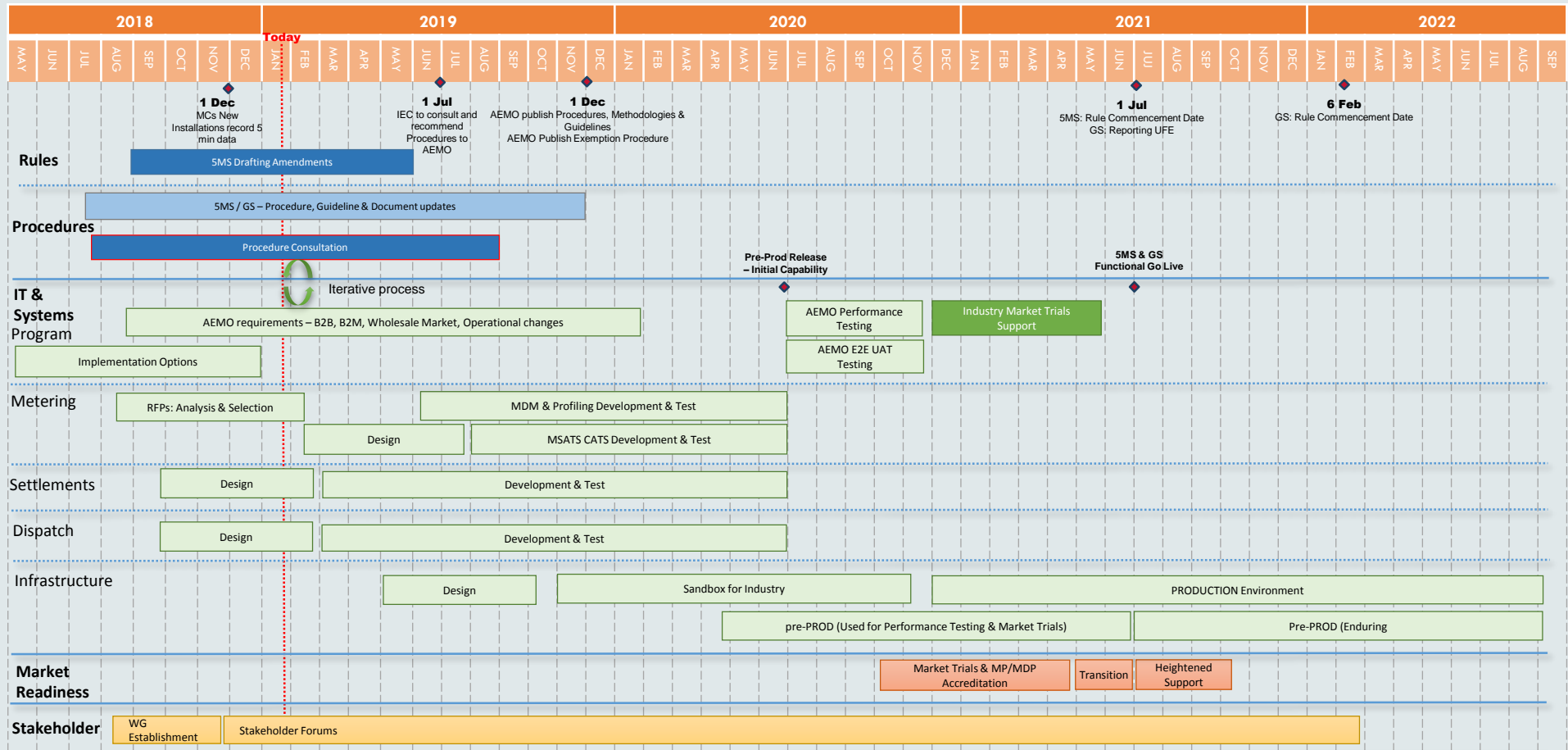
# Participant Systems

- Impact to participants is a critical driver of total industry costs
- Transformation to AEMO systems will be done so as to minimise the cost impact to participant systems:
  - AEMO is exploring options to provide transition interfaces to reduce the impact of 5MS
- New interfaces will be made available as an option, which support modern API technology:
  - More aligned with industry standards
  - Less effort required to integrate
  - More flexible options for accessing (e.g. mobile devices)

# AEMO Cost Recovery

- Cost Recovery via Current NEM Fee Structure
  - Cost per NMI of ~\$1.10 per annum over 10 years, commencing 2021
  - Across 10m NMIs, this results in annual AEMO cost recovery of ~\$11m per annum
  - The majority of costs allocated to retailers through the 'FRC Electricity' charge (~\$1 pa per NMI)
  - Small impact on generators and wholesale customers through 'NEM' charge (~\$0.10 per NMI)
  - Bottom-up cost allocation performed to assign program costs to these categories
- Other Cost Recovery options being assessed
  - For example, declared NEM Project
  - Potential benefit of spreading the cost base more broadly
  - Would require consultation, option to be considered
- 5MS rule change benefits (from AEMC Determination)
  - Improved bidding incentives and price signals for investment and market operation
  - Annual NEM transactions (\$16.6b in 2016/17) and expected medium term investment (up to \$90b) in NEM.

# 5MS – Implementation Timeline



- Market critical applications, requires robust program and robust testing
- Integrated project and integrated project timeline
- Timeline is achievable, albeit challenging
- Time allowed for industry preparation and readiness

# Industry benefit

Peter Carruthers

# Expected benefits

- AEMO expects the technology transformation will deliver significant benefits going forward, including:
  - Allow AEMO to continue to provide reliable operation of the critical NEM metering and settlement functions
  - Reduce the risk associated with the technical debt of legacy systems
  - Allow AEMO to support the projected growth in meter data as a result of 5MS, and the continued market-led rollout of smart meters
  - Support improved use of metering data within AEMO's forecasting and planning functions, to better adapt to the changing dynamics of the power system
  - Provide greater flexibility to respond to change, particularly with respect to many of the expected market developments over the next 3-5 years
  - Deliver better services to participants, including more flexible and modern interfaces and data services
  - Supports the long-term interests of consumers, consistent with the National Electricity Objective.



# Next steps

- AEMO will continue its briefings over the coming months:
  - Briefing to jurisdictions, ESB, AER
  - Engagement with market participants through 5MS Program Consultative Forum
  - Briefing to NEM Wholesale Consultative Forum
- Further information on the cost impact will be provided in the draft budget and revenue requirement for FY19-20 to be published in March 2019

# Forward meeting plan

Peter Geers

# 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](mailto:5ms@aemo.com.au)
  - 5MS webpage:  
<http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement>

# Upcoming meetings

- Next Executive Forum:
  - To be advised
- Next Program Consultative Forum:
  - Friday 8 March
- Next Procedure Working Group:
  - Tuesday 12 March
- Next Systems Working Group:
  - Monday 18 March
- Meetings and forum dates:  
<http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Five-Minute-Settlement>

