

NEM Reform Electricity Wholesale Consultative Forum (EWCF)



Meeting #14
19 March 2024



1. Welcome

We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

We pay respect to their Elders past and present.

Agenda

#	Time	Topic	Presenter(s)
1	1:00-1:05pm	Welcome	Chris Muffett
2	1:05-1:10pm	Actions & Feedback from Previous Meeting	Chris Muffett
3	1:10-1:30pm	In-flight Reform Update <ul style="list-style-type: none"> • Integrated Energy Storage System (IESS) • Frequency Performance Payments (FPP) • Project Energy Connect Market Integration (PEC – MI) 	<ul style="list-style-type: none"> • Emily Brodie • Oliver Derum • Nicole Nsair
4	1:30-1:45pm	Consultation Update <ul style="list-style-type: none"> • Update on consultation of the Reserve Level Declaration Guidelines 	<ul style="list-style-type: none"> • Nicole Nsair
5	1:45-1:55pm	Procedures Consultation Roadmap	Nicole Nsair
6	1:55-2:25pm	NEM Wholesale Issues & Changes <ul style="list-style-type: none"> • ICF 001 – Reducing the notification period for Default Contribution Factors • ICF 002 – Time taken for dispatch targets to be made available to participants 	<ul style="list-style-type: none"> • Oliver Derum • Alice Kelly & James Kelly
7	2:25-2:45pm	Other Reforms <ul style="list-style-type: none"> • IDAM, IDX & PC • SCADA Lite • ST PASA (Verbal Update) 	<ul style="list-style-type: none"> • Paul Johnson • Paul Johnson • Chris Muffett
8	N/A	For noting <ul style="list-style-type: none"> • Upcoming Engagements 	N/A
9	2:45-3:00pm	General Questions and Other Business	Chris Muffett

Appendix A:
Competition law meeting protocol and AEMO forum expectations

Appendix B:
Additional Dispatch Timing Analysis

“Please note that this meeting will be recorded by AEMO and may be accessed and used by AEMO for the purpose of compiling minutes. By attending the meeting, you consent to AEMO recording the meeting and using the record for this purpose. No other recording of the meeting is permitted”

2. Actions & Feedback from Previous Meeting

Actions & Feedback from Previous Meeting

(Item = Meeting # – Agenda # – Reference)

Item	Topic	Action	Responsible	Notes
13.6.0.1	Procedures Consultation Roadmap	AEMO to provide participants with an update on the AEMC Clarifying mandatory primary frequency response (PFR) obligations for bidirectional plant Rule Change consultation.	AEMO	Closed – will be discussed under agenda item 5
13.7.0.1	NEM Wholesale Issues & Changes	Participants to advise AEMO if ICF 001 is a priority for their organisation.	Participants	Closed - will be discussed under agenda item 6
13.9.0.1	Stakeholder Sentiment Survey - Results	AEMO to look at if MS teams chat interactions can be shared with external participants.	AEMO	Closed - verbal update with be provided
13.11.1	General questions and other business	AEMO to consider including a section in EWCF slide pack on related changes to ST PASA.	AEMO	Closed - included under agenda item 7

The latest meeting minutes and materials are available on the [NEM Reform Electricity Wholesale Consultative Forum](#) webpage.

3. In-flight Reform Update

Integrated Energy Storage System (IESS)

Emily Brodie

IESB industry readiness is underway

- ~ 2 weeks until market trial
- < 3 months until go-live



INDICATIVE INDUSTRY PREPARATIONS

- Individual development and testing
- Where applicable, prepare for industry testing and market trial
- BESS participants to work with their bidding system vendor and AEMO to establish cutover timing to BDU operations

I ESS key milestones 2024

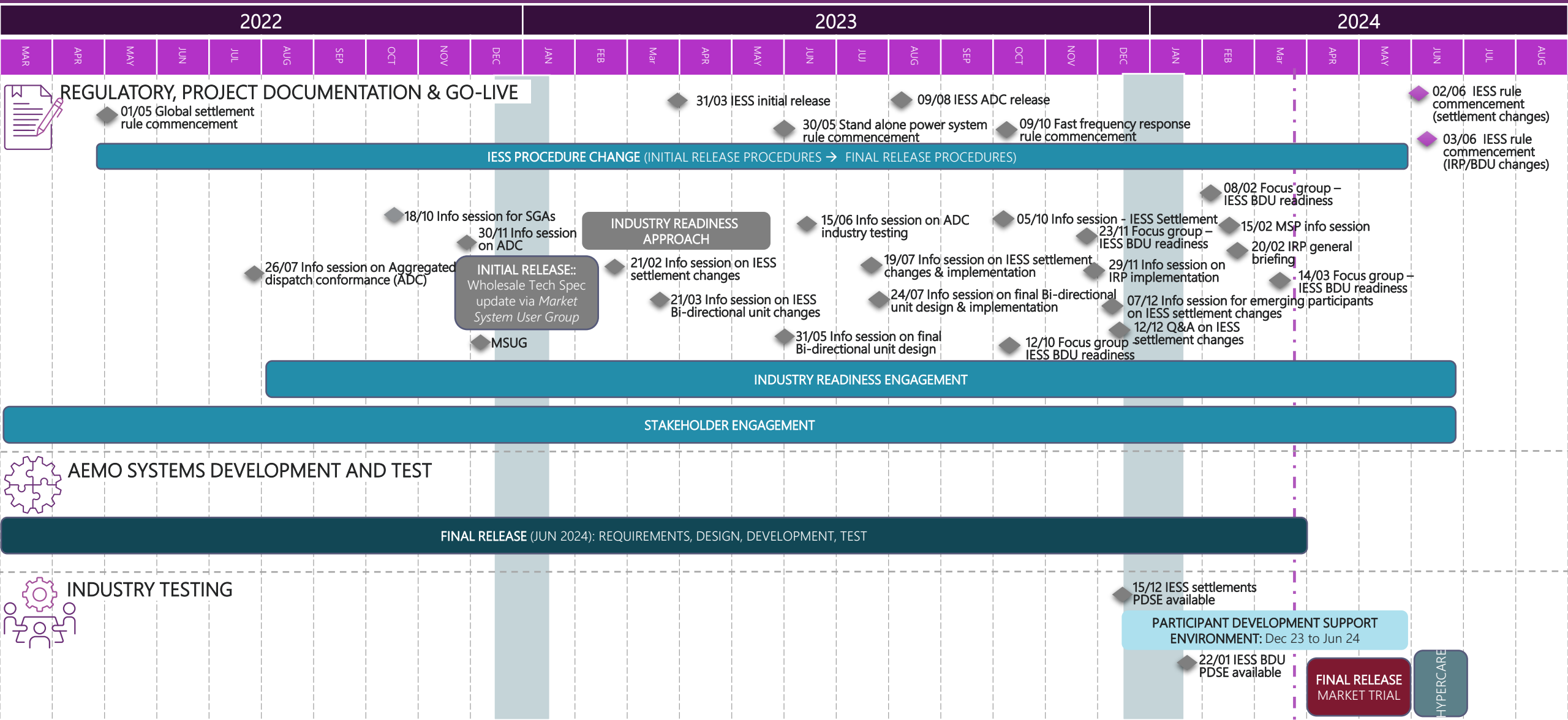
****Detailed information and dates are in the IESS release schedule****

MONTH	ACTIVITY
JAN 2024	<ul style="list-style-type: none"> ✓ Publish draft market trial plan ✓ Publish final transition plans – BDU, IRP, NCC ✓ PDSE ready for BDU bidding & dispatch
FEB 2024	<ul style="list-style-type: none"> ✓ Publish final market trial plan ✓ Publish draft Industry go-live plan
MAR 2024	<ul style="list-style-type: none"> ✓ Initiative readiness checkpoint (-3months) ✓ EMMS data model released to pre-production
APR 2024	<ul style="list-style-type: none"> • IESS market trial period starts • EMMS data model released to production • Final tech specs available • Publish final Industry go-live plan
MAY 2024	<ul style="list-style-type: none"> • Go-live checkpoint (-1 month)
JUN 2024	<p>I ESS rule commencements:</p> <ul style="list-style-type: none"> • Sun 02 Jun: IESS settlements commences • Mon 03 Jun: BDU bidding & dispatch commences <ul style="list-style-type: none"> • Hypercare

Other activities throughout Q1 & Q2 2024 include:

- Completing remaining minor/administrative procedure consultations
- Stakeholder engagement
 - NEM Reform forums
 - Information sessions
 - Q&A sessions
 - 1to1 discussions as necessary

IESS – Indicative Industry Timeline



- IESS Confirmed
- IESS Indicative
- Concurrent initiatives
- Completed activities
- Summer holiday periods: Avoid industry IESS activities where possible
- Market trial (in pre-production): Starts 02 Apr 2024

Frequency Performance Payments (FPP)

Oliver Derum



Available FPP resources

Type	Details
Technical Documents	High-level technical data design Frequency Contribution Factor Tuning Parameters and Input Sources Frequency Contribution Factors Procedure AEMO FPP FAQ document
Readiness Documents	Readiness & Go-Live Criteria for Non-Financial Operation New
Slide Packs	FPP Industry impacts and timings workshop FCFP – Stakeholder technical workshop (reporting) FCFP development technical workshop FCFP Consultation (includes financial analysis)
Video explainers	Eight video explainers on different aspects of the FPP system are published on the FPP project page on AEMO’s website .
Fact Sheets	Overview of the FPP reform FPP calculations and participant outcomes
Information Session Material	The presentation and recording from the 23 February 2024 Information session have recently been published. New

All resources are available from the FPP project page on AEMO’s website: <https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/system-operations/ancillary-services/frequency-contribution-factors>

Project Energy Connect Market Integration (PEC – MI)



Nicole Nsair



PEC Market Integration Directions Paper Consultation

Consultation Activity	Indicative Date	Status
Directions Paper published	1 November 2023	Completed
PEC-MI Information Session	Tuesday 14 November 2023	Completed
Submissions closed	Friday 1 December 2023	Completed
Final Report published	Friday 9 February 2024	Completed
AEMO's Rule Change Proposal submitted	Friday 23 February 2024	Completed
PEC-MI Information Session	Thursday 15 February 2024	Completed

Consultation Page

<https://www.aemo.com.au/consultations/current-and-closed-consultations/project-energy-connect-market-integration-paper>

2023-26 Plan on a Page

Deliverable	Indicative Timeline
AEMO Directions Paper Consultation	Final Report 9 February 2024
AEMO Rule Change Proposal to AEMC	23 February 2024
AEMC Rule Change Consultation	Q1 2024 – Q4 2024 TBC (Note 1)
AEMO Procedure change consultations	Q4 2024 – Q2 2025 TBC (Note 1)
AEMO System changes	Q2 2025 – Q4 2025 TBC (Note 1)
PEC Market Integration implementation	Commencing Q1 2026 TBC (Note 2)

2024 will focus on the AEMC Rule Change

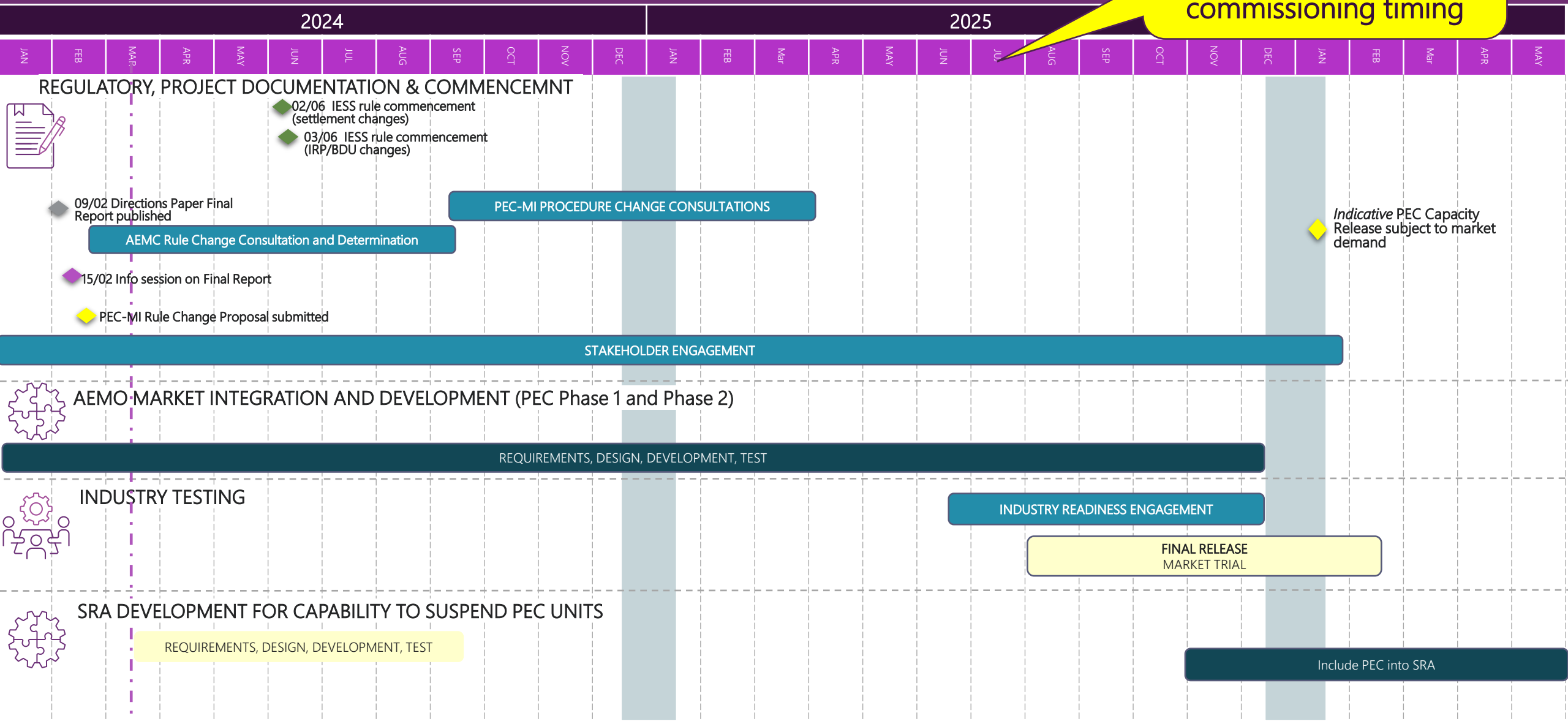
Notes:

1. Rule and procedure dates indicative timeframes, subject to AEMC timing
2. Implementation dates are based on asset owner's indicative timeframes

PEC-MI – Indicative Industry Timeline

As of 15/2

Subject to change based on revised commissioning timing



- PEC-MI Confirmed
- PEC-MI Indicative
- Concurrent initiatives
- Completed activities
- Summer holiday periods

4. Consultation Update

Update on consultation of the Reserve Level Declaration Guidelines



Nicole Nsair

Consultation Outline

- AEMO commenced an expedited consultation on the Guidelines on 20 February 2024 as per NER 4.8.4A(e).
 - *This clause requires AEMO to initiate changes to these Guidelines using the expedited rules consultation procedure.*
- Intent of the consultation is to reduce the operational risks associated with externally provided software applications which the current BBN model runs on.
- The consultation is narrow and requires expedition to resolve this vendor risk issue quickly.
 - There will be future changes to these Guidelines which will be consulted on later in 2024.

AEMO consultation webpage:

<https://aemo.com.au/consultations/current-and-closed-consultations/2024-consultation-on-changes-to-reserve-level-declaration-guidelines>

Consultation Update

- As of 12 March 2024, AEMO has not received any formal submissions regarding the draft report.
- AEMO would like to clarify that the reason for this consultation is firstly to minimise operational risk and improve resiliency from the current methodology.

Consultation Dates:

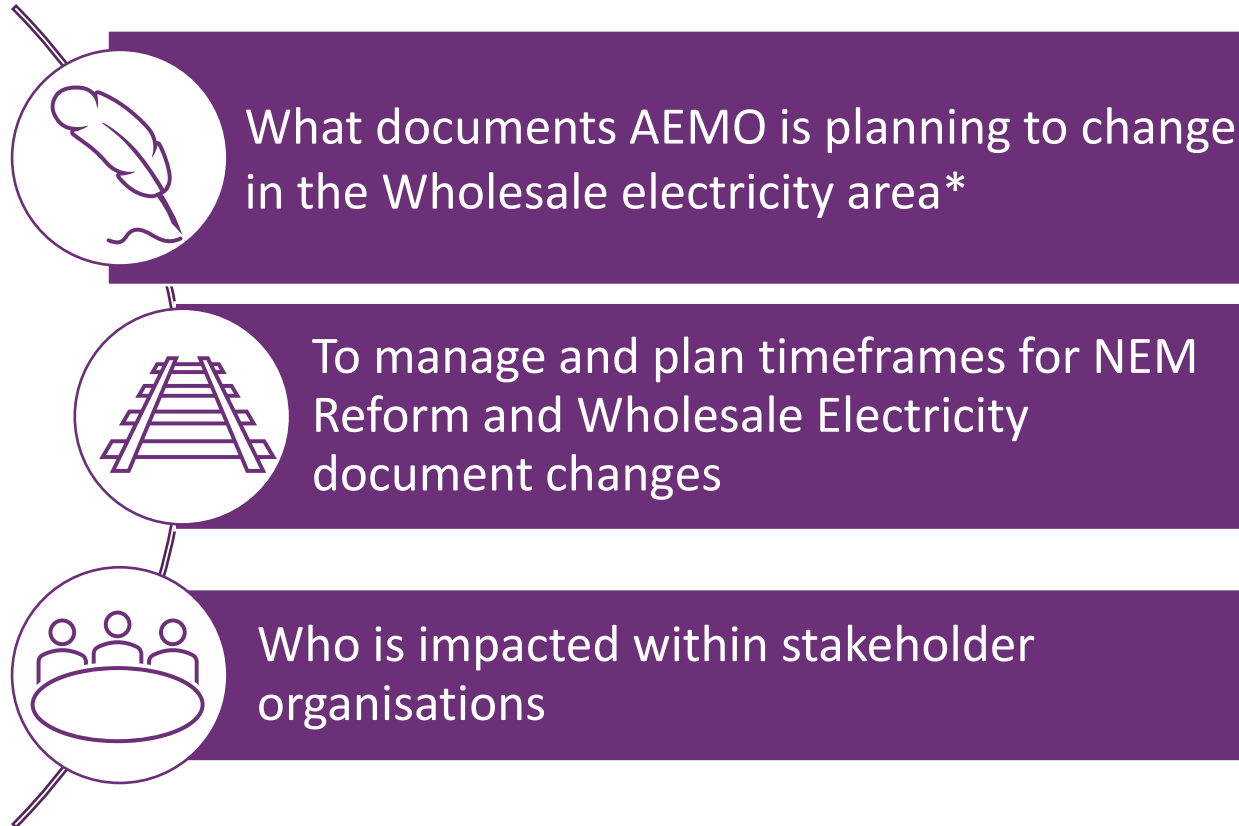
Deliverable	Timeline
Consultation opens / Draft report published	20 February 2024
Procedure change request deadline	5 March 2024
Submissions due on draft report	5pm (AEDT), 19 March 2024
Final report published	2 May 2024 (up to)
Updated guidelines effective date	22 May 2024 (planned)

Consultation Purpose

- Reduce operational risk and improve resiliency associated with calculating the FUM by:
 - Replacing the underlying FUM model used to calculate the FUM, and;
 - Operating the new FUM model that is supported in-house by AEMO teams.
- Minor improvement to the FUM output by:
 - Adding ‘time-of-day’ as an input variable which gets considered for all existing input variable in calculating the FUM.
 - Better captures the uncertainty effects of solar generation. However, does not materially change the calculated FUM compared to the FUM produced by the BBN model.

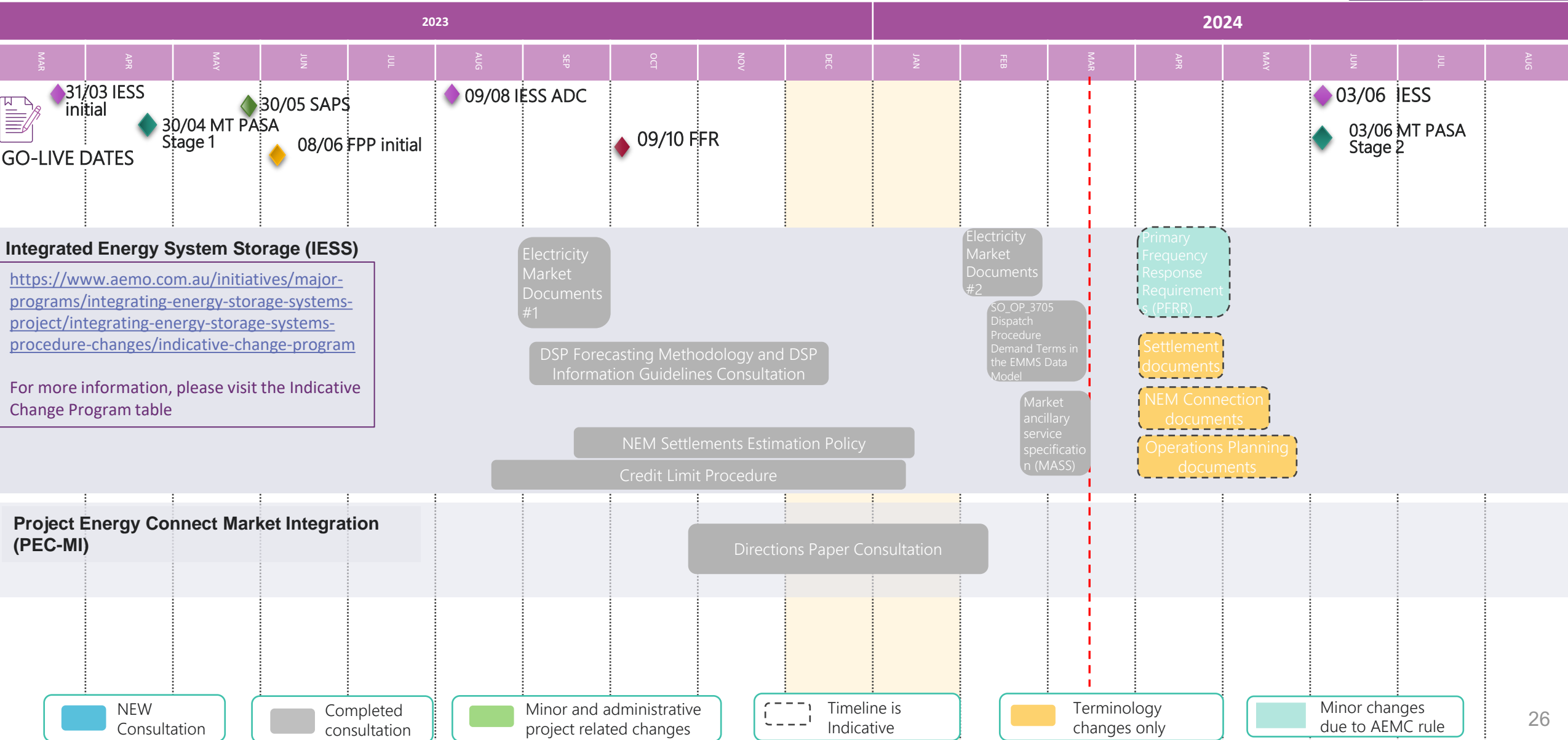
5. Procedures Consultation Roadmap

Procedures Consultation Roadmap



*Retail procedure changes are discussed through the Electricity Retail Consultative Forum (ERCF)

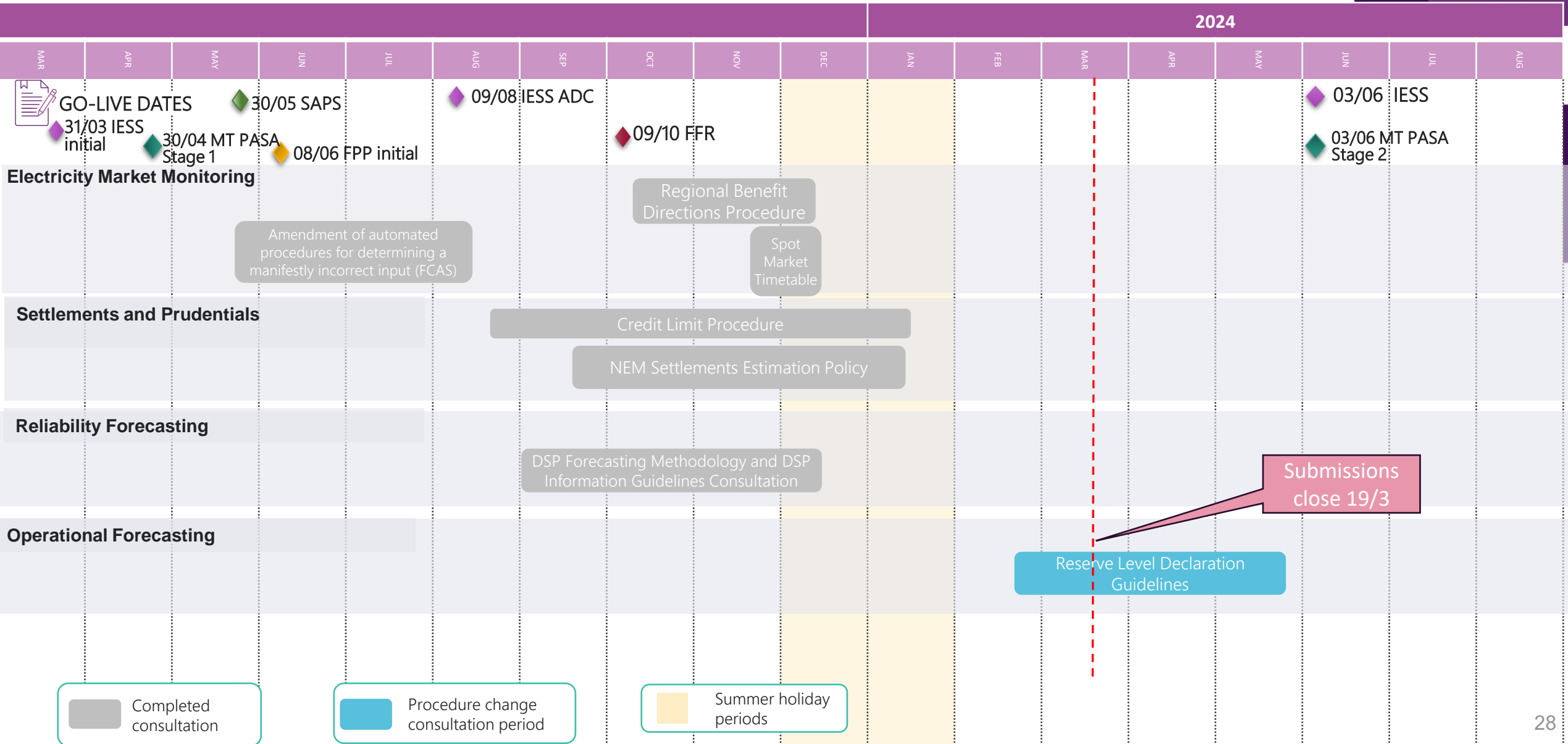
Reform INDICATIVE Consultation Timelines



Consultation Timelines – Reform Inflight projects

In-flight projects	Consultation packages*	Consultation Type	Key dates
Integrated Energy System Storage (IESS)	Electricity Market Documents #2 (Terminology update to include BDU)	SO_OP_3708 Non-Market Ancillary Services Regulation FCAS Contribution Factors Procedure (Causer Pays) Frequency Contribution Factors Procedure	Commencement – 5 Feb 2024 Submissions close – 19 Feb 2024
	SO_OP_3705 Dispatch Procedure	Terminology update to IESS Rule and includes BDU design	Commencement – 19 Feb 2024 Submissions close – 8 Mar 2024
	Demand Terms in the EMMS Data Model	Terminology update – included on Electricity Market Documents #1 consultation page	Commencement – 19 Feb 2024 Submissions close – 30 Apr 2024
	Market ancillary service specification (MASS)	Removed ‘ancillary service generating unit’ and ‘ancillary service load’ and replace with ‘ancillary service unit’	Commencement – 4 March 2024 Submissions Close – 15 March 2024
	Primary Frequency Response Requirements (PFRR)	Terminology update to include AEMC rule "Clarifying mandatory PFR obligations for BDU plant"	To be completed by 3 June 2024
	Operations Planning documents	Terminology update for IESS	Commencement – April 2024
	NEM Connections documents	Terminology update for IESS	Commencement – April 2024
	Settlement documents	Terminology update for IESS	Commencement – April 2024

Wholesale Electricity INDICATIVE Consultation Timeline



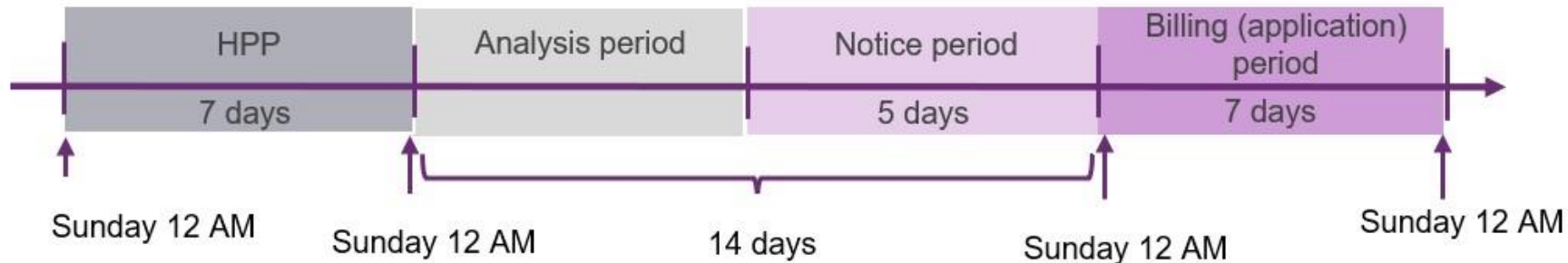
6. NEM Wholesale Issues & Changes

ICF 001 – Reducing the notification period for Default Contribution Factors

Oliver Derum



Reducing the notification period for Default Contribution Factors



- At the February EWCF, AEMO called for participants to indicate that reducing the notification period for DCFs was a priority for them.
 - No additional stakeholders have provided any comment.
 - Only the original participant who identified this issue has expressed a desire to be involved in the development of a rule change.
- As stated last month, participant feedback to date does not provide strong support for the development of a rule change. This remains the case.**
- AEMO does not intend to commence the development of a specific rule change at this stage, but will be mindful of opportunities to progress this change as part of any related work in the future.**

ICF 002

Time taken for Dispatch Targets to be made available to participants



Alice Kelly & James Kelly

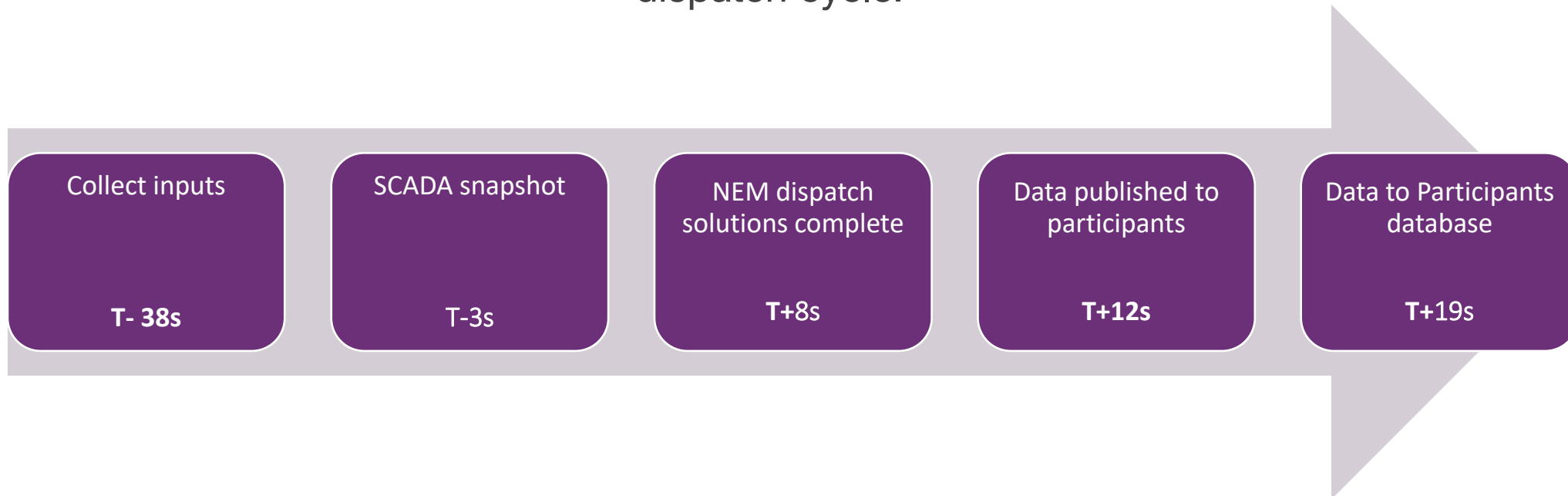


Objective

- AEMO is responding to concerns raised by participants on the mismatch between the 5-minute interval boundary and when a dispatch target is received (and a unit can start moving to the new target)
 - Raised during Causer Pays Review, 5MS Project, and FCFP Consultation
- The objective of this dispatch timing investigation is:
 - Providing greater awareness of the dispatch process and the steps involved
 - Investigating the impacts of the misaligned timing – both in terms of power system operation and participant commercials
 - Investigate opportunities to improve alignment

NEM dispatch timing

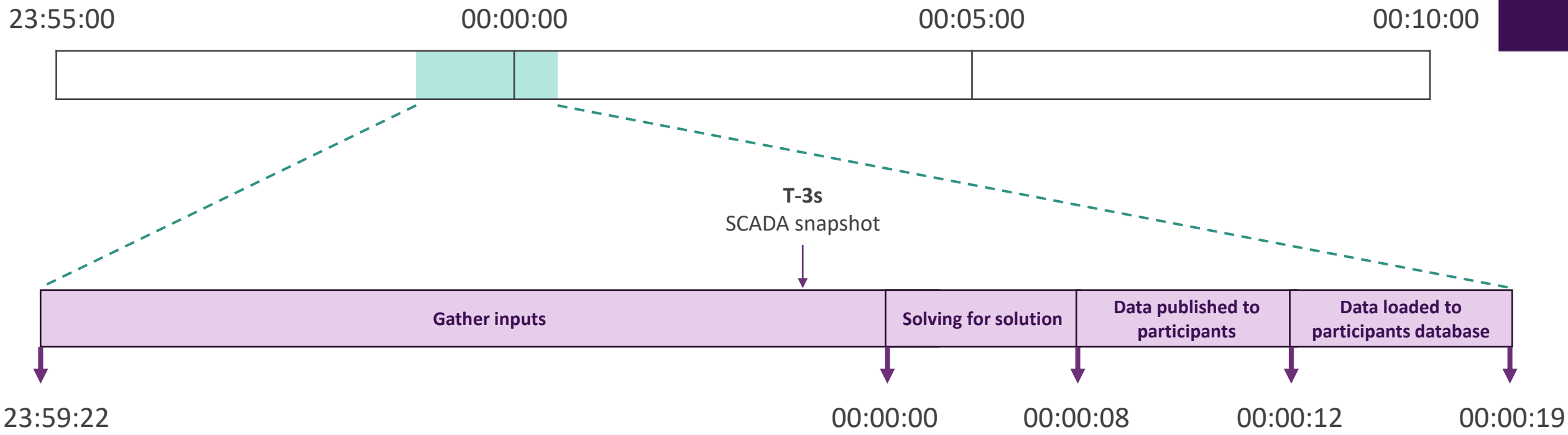
The dispatch systems must reliably deliver complex computations within a 5-minute dispatch cycle.



Solution and publishing times are longer during market events such as intervention in which case multiple solutions need to be run

NEM Dispatch Process Example

Below is an example of the timing of the dispatch process (taken from our production environment delivered via data interchange).



Individual processes

Gather inputs

Duration: ~38 seconds

- Process start
- Gather invoked constraints/limits
- Poll market/bid data
- Process market/bid data
- Poll SCADA Data
- Process SCADA data and generate input file for NEMDE

Solving for solution

Duration: ~8 seconds

- NEMDE solves case four times
- Checks if solution is over-constrained
- Solution is loaded into internal database

Data published to participants

Duration: ~4 seconds

- Dispatch reports generated and distributed to participants
- Reports distributed to participants via 3 ways:
 1. EMMS - data interchange process ~4s
 2. SCADA ~4s
 3. AGC ~<1s

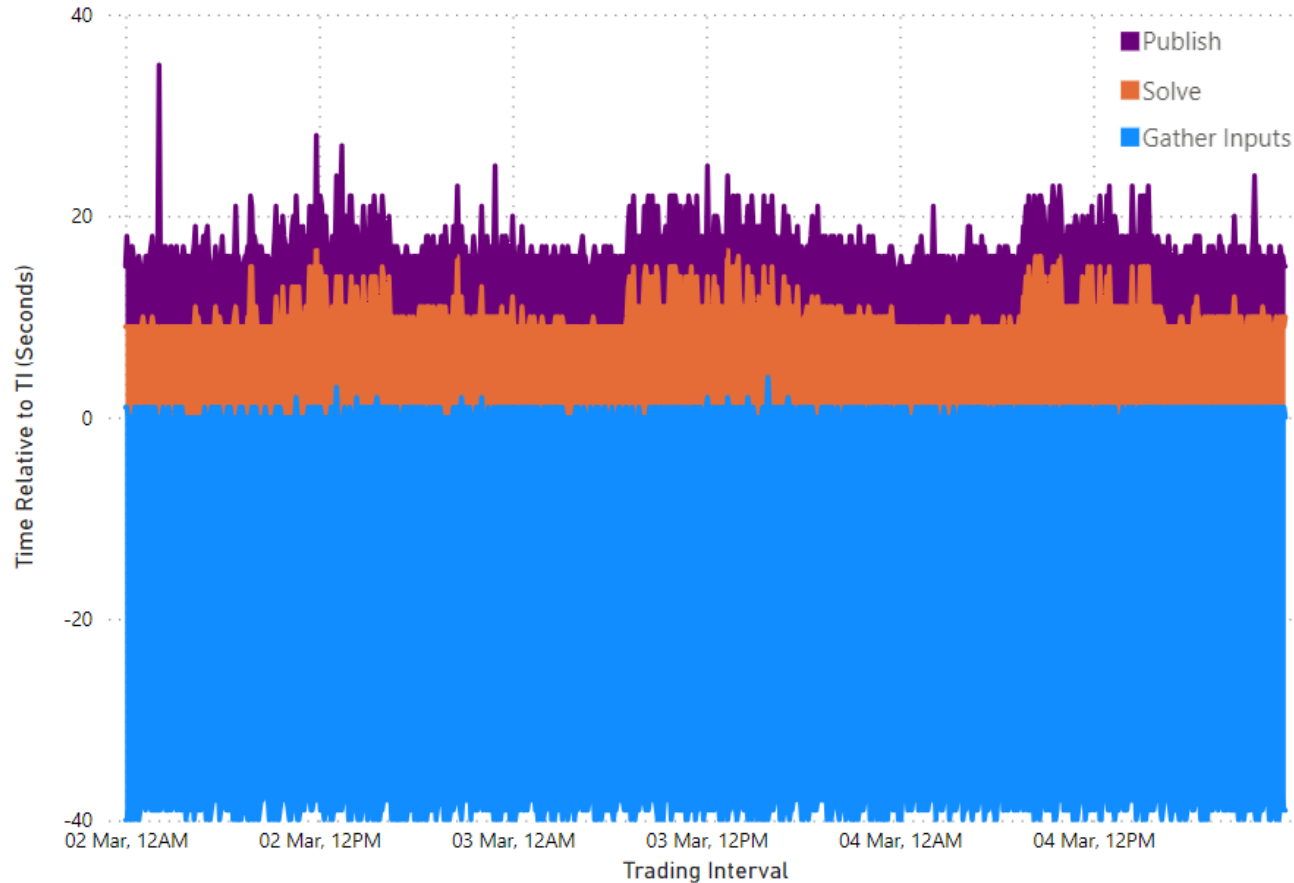
Data loaded to participants database

Duration: ~7 seconds

- Participants download dispatch report file
- Load information to participant database

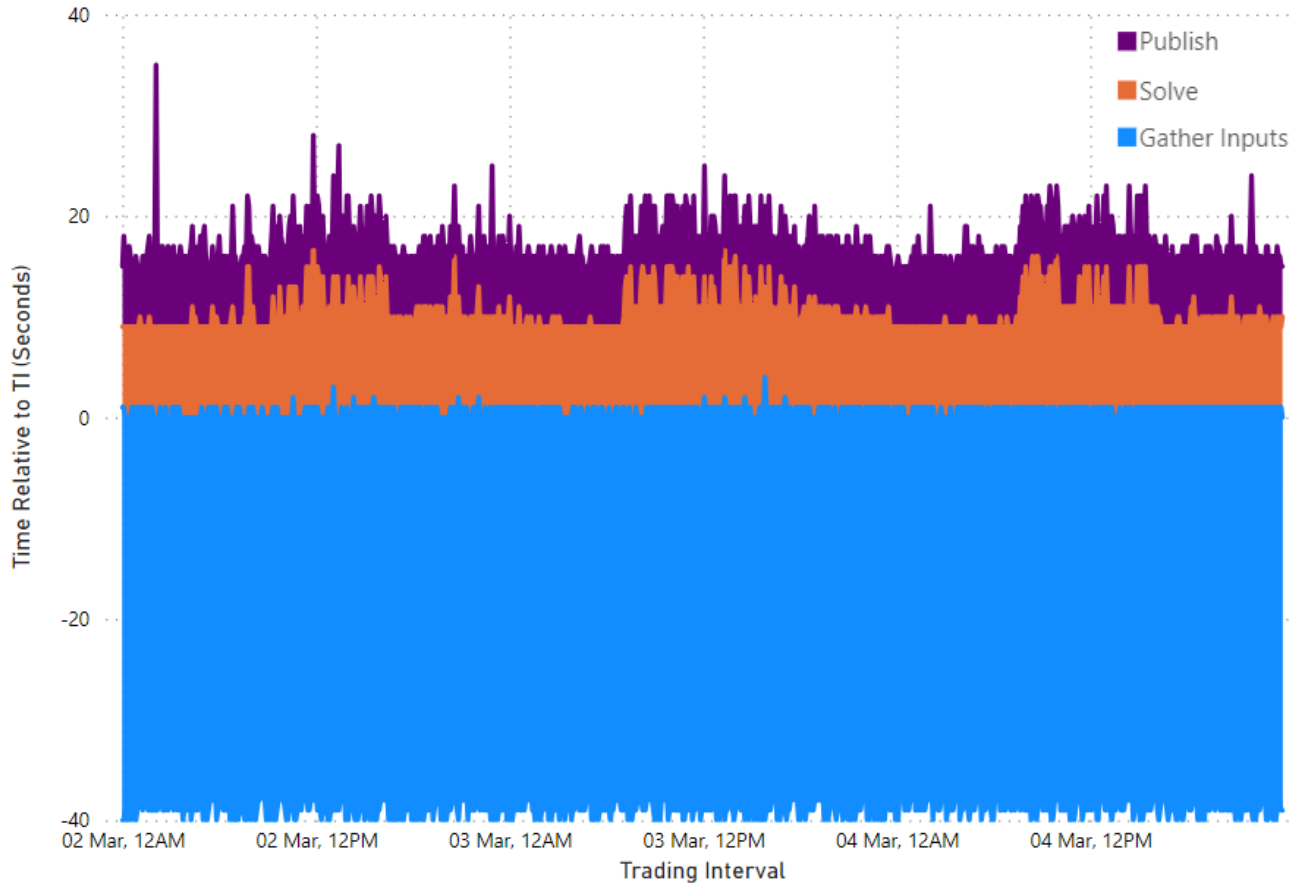
Preliminary Analysis

Assumptions



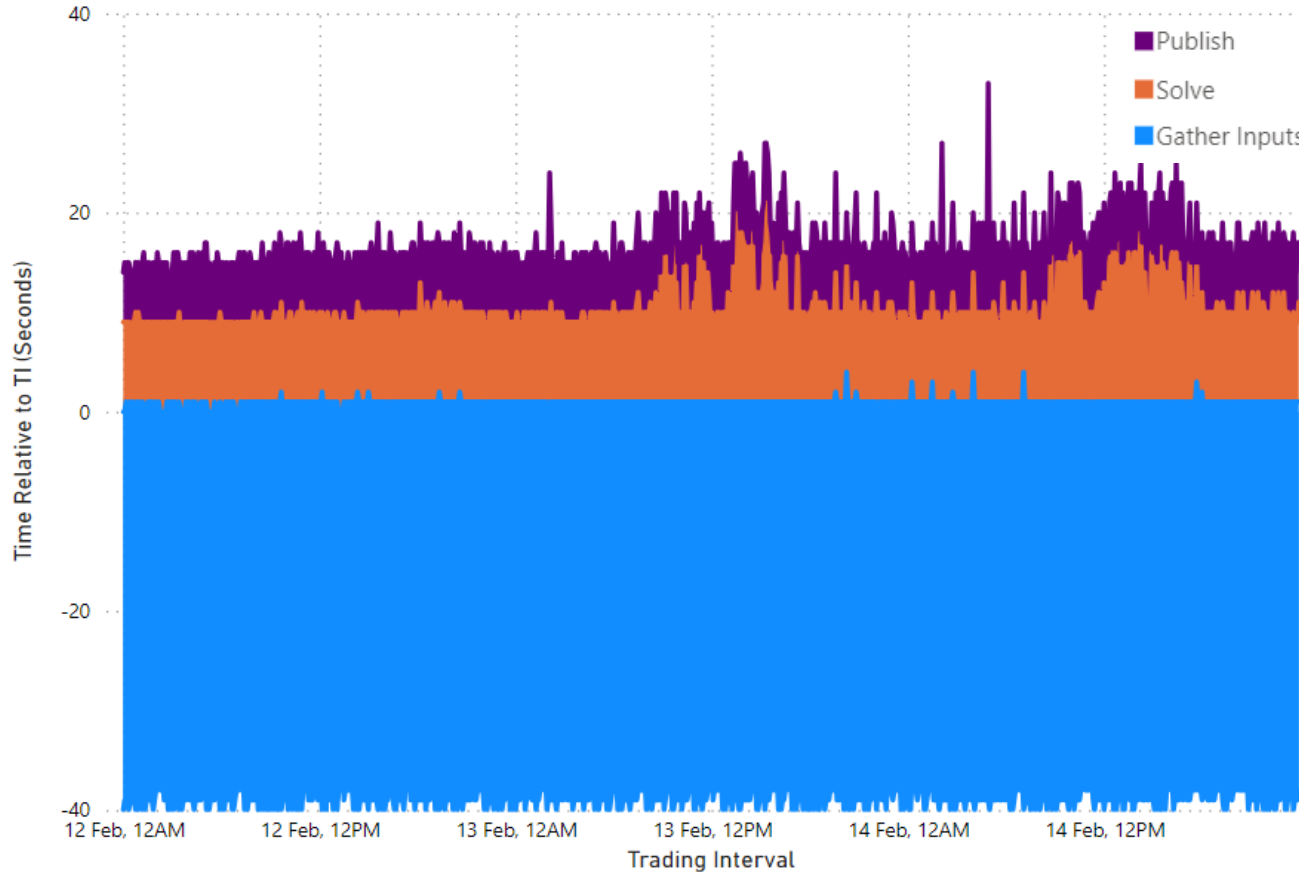
- Publishing through Infor System aka file sharing
- Gather Inputs offset 2 seconds earlier in line with approximant time NEMDE starts
- Solve end 1 second to allow for approximant time of OCD file merger

General Trends



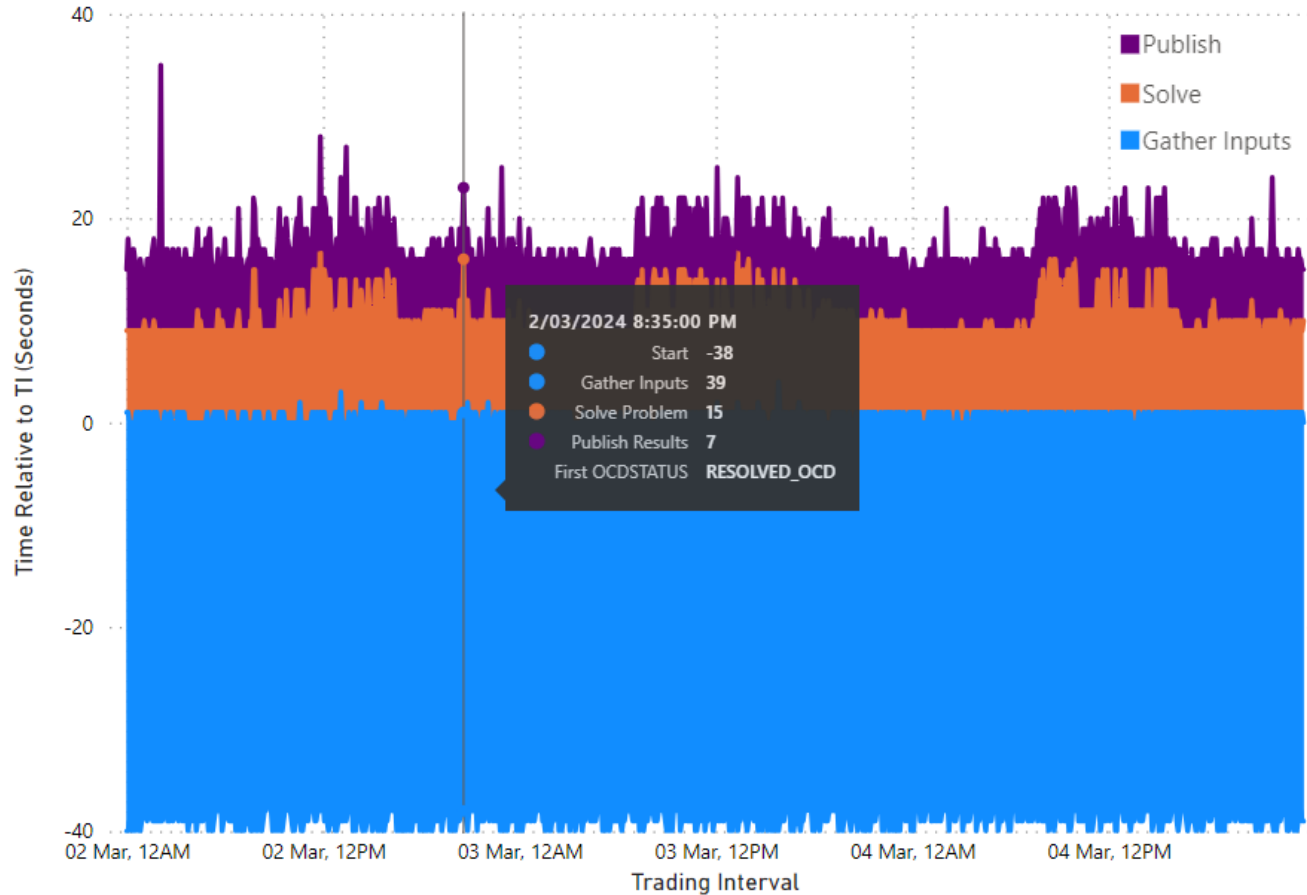
- Three-day example
- Gather input consistent as (only the last step, gather SCADA, generally causes variance)
- Solve takes longer during the day (may be due to virtual machine traffic)
- Does this reflect what you see on your end?

Power System Event Analysis



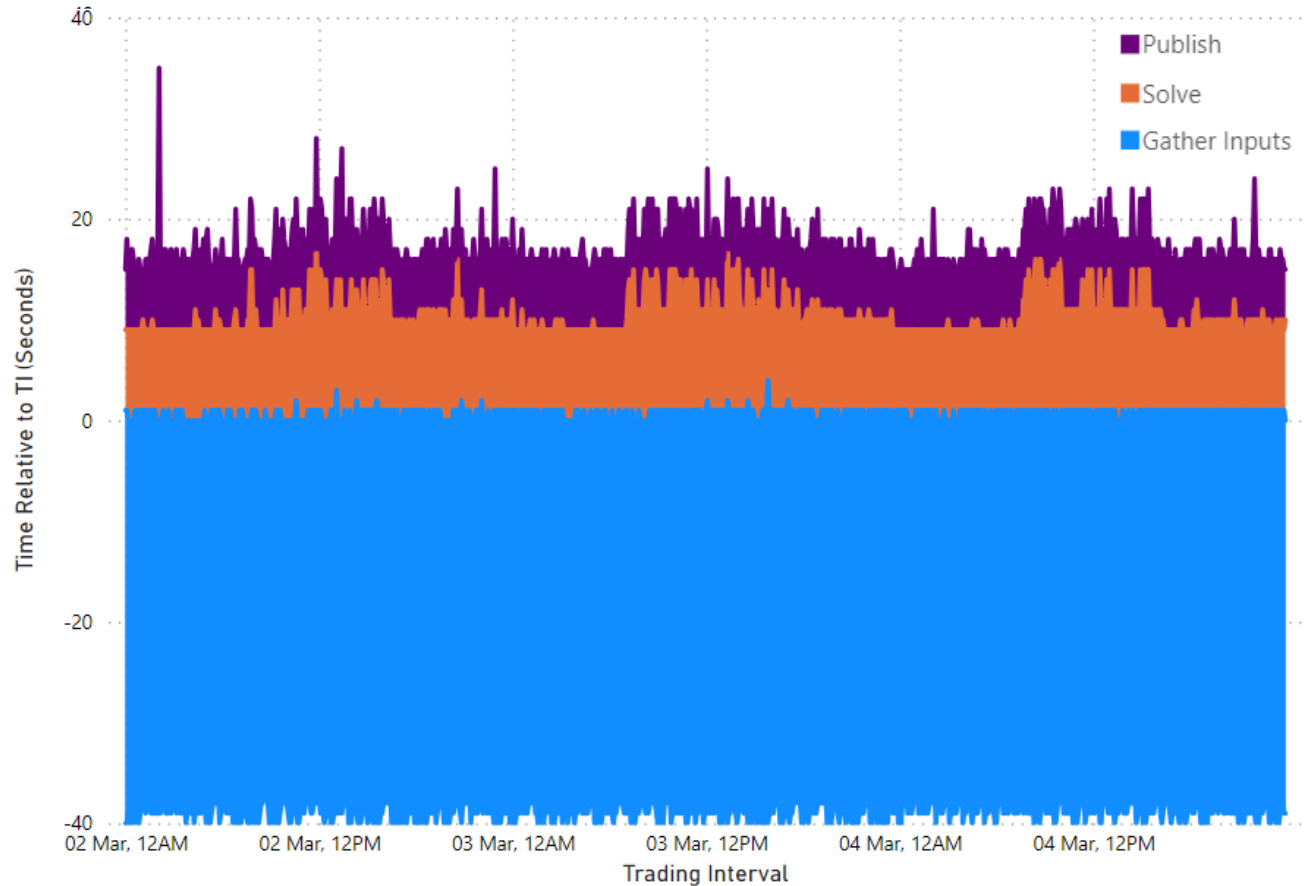
- Transmission outage in VIC at 13:10 TI appears to have increased the solve time but not dramatically

Ongoing Analysis



- 41 days in 2023 had at least one OCD rerun *See appendix B
- These do impact timing but investigating exact details of the impact is ongoing
- Cause of spikes in Publishing (early on the 2nd of Mar) is currently unknown

Additional Analysis



- See Appendix B for more details analysis
- Each step is quite consistent with notable outliers
- Calculation time is generally trending upwards as inputs increase

Next steps

On going work

- Continue to investigate opportunities to improve the time between when participants receive their targets at the start of the dispatch interval and understand the potential impacts on the power system
- Potential to provide participants with regular statistics on dispatch timing to enhance transparency
- Feedback from participants on:
 - Process designed around reliability > speed – balancing the priority?
 - Is this a key issue AEMO should continue to evaluate/resolve?

7. Other Reforms

IDAM, IDX & PC

Paul Johnson

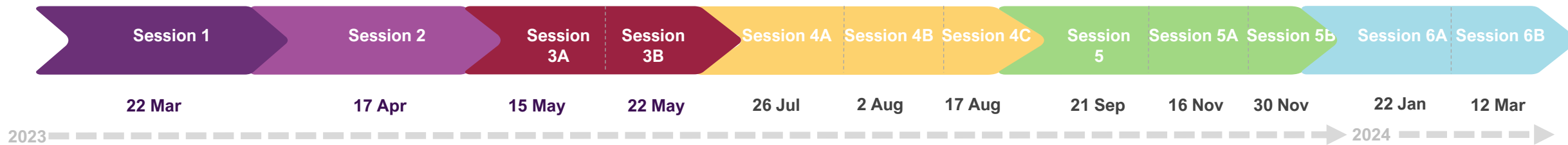
Industry Consultation Update

Draft Business Case

- AEMO received 9 submissions in response to the latest Draft Business Case Package.
- Stakeholders were generally supportive of the recommendations, and the majority of the feedback was specific items to make the business case clearer or more compelling.

Published information and materials:

- IDAM, IDX, PC webpage: <https://aemo.com.au/en/consultations/industry-forums-and-working-groups/list-of-industry-forums-and-working-groups/nem-reform-foundational-and-strategic-initiatives-focus-group>
- Any queries can be directed to NEMReform@aemo.com.au



Session	Introduction	Discovery	Target State	Transition Strategy	Cost & Method	Business Case
Agenda	<ul style="list-style-type: none"> • Introduce initiatives • Outline workshop plan 	<ul style="list-style-type: none"> • Pain points and benefits • Survey 	<ul style="list-style-type: none"> • Concept walkthrough • Survey 	<ul style="list-style-type: none"> • Transition Strategy • Impacts & Benefits • Survey 	<ul style="list-style-type: none"> • Industry and AEMO costs • Assumptions, options and methodology 	<ul style="list-style-type: none"> • Walkthrough of draft business case • Assessment and completion

Next Steps: Key Milestones

Date	Key Milestones	
Tuesday 19 December 2023	Release of draft business case package	Completed
Monday 22 January 2024	Draft business plan walk through session with stakeholders	Completed
Tuesday 23 January to Thursday 8 February 2024	Additional 1 on 1 meetings held with stakeholders	Completed
Friday 9 February 2024	Stakeholder submissions received on draft business case package	Completed
Tuesday 27 February 2024	Published updated “Business Case – Draft”	Completed
Tuesday 12 March 2024	Second / final stakeholder session – walk through of updates, next steps, closure of working group	Completed
Thursday 28 March 2024	Present at NEM Reform Executive Forum “Business Case – Draft”	
End April 2024 (TBC)	Issue final Business Case and confirm Decision.	

SCADA Lite

Paul Johnson

SCADA Lite Update

- AEMO has now received Investment approval to proceed with SCADA Lite implementation.
- AEMO is currently conducting a Proof of Concept (POC) on identified approach and formalising delivery approach and timings.
- Milestones and progress reporting will be incorporated into NEM Reform program and forums (PCF, Implementation Forums).
- Current expectation that SCADA Lite Go-Live 4th Quarter 2024.

ST PASA

Chris Muffett **Verbal Update**

8. For Noting

Upcoming Engagements

For noting

Upcoming Engagements

March							April						
M	T	W	T	F	S	S	M	T	W	T	F	S	S
				1	2	3	1	2	3	4	5	6	7
4	5	6	7	8	9	10	8	9	10	11	12	13	14
11	12	13	14	15	16	17	15	16	17	18	19	20	21
18	19	20	21	22	23	24	22	23	24	25	26	27	28
25	26	27	28	29	30	31	29	30					

May							June						
M	T	W	T	F	S	S	M	T	W	T	F	S	S
		1	2	3	4	5						1	2
6	7	8	9	10	11	12	3	4	5	6	7	8	9
13	14	15	16	17	18	19	10	11	12	13	14	15	16
20	21	22	23	24	25	26	17	18	19	20	21	22	23
27	28	29	30	31			24	25	26	27	28	29	30

NEM Reform Program Committees/Forums

Executive Fourm	Yellow
Reform Delivery Committee	Green
Reform Delivery Committee Collaborative Workshop	Cyan
Program Consultative Forum	Purple
Electricity Wholesale Consultative Fourm	Red
Implementation Forum	Pink
Industry Testing Working Group	Blue

NEM Reform Initiative Specific

Foudational and Strategic Initaitives Focus Group	Dark Grey
IESS Participant Development Support Environment (PDSE) Q&A	Yellow
IESS BAU Focus Group	Brown

Other Forums

Electricity Retail Consultative Forum	Light Green
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Other

National Public Holiday	Grey
State/Territory Public Holiday	Dark Grey

9. Questions and Other Business



NEMReform@aemo.com.au



[NEM Reform Electricity Wholesale Consultative Forum](#)



Appendix A: Competition law meeting protocol and AEMO forum expectations

AEMO Competition Law - Meeting Protocol

AEMO is committed to complying with all applicable laws, including the Competition and Consumer Act 2010 (CCA). In any dealings with AEMO regarding proposed reforms or other initiatives, all participants agree to adhere to the CCA at all times and to comply with this Protocol. Participants must arrange for their representatives to be briefed on competition law risks and obligations.

Participants in AEMO discussions **must**:

- Ensure that discussions are limited to the matters contemplated by the agenda for the discussion
- Make independent and unilateral decisions about their commercial positions and approach in relation to the matters under discussion with AEMO
- Immediately and clearly raise an objection with AEMO or the Chair of the meeting if a matter is discussed that the participant is concerned may give rise to competition law risks or a breach of this Protocol

Participants in AEMO meetings **must not** discuss or agree on the following topics:

- Which customers they will supply or market to
- The price or other terms at which Participants will supply
- Bids or tenders, including the nature of a bid that a Participant intends to make or whether the Participant will participate in the bid
- Which suppliers Participants will acquire from (or the price or other terms on which they acquire goods or services)
- Refusing to supply a person or company access to any products, services or inputs they require

Under no circumstances must Participants share Competitively Sensitive Information. Competitively Sensitive Information means confidential information relating to a Participant which if disclosed to a competitor could affect its current or future commercial strategies, such as pricing information, customer terms and conditions, supply terms and conditions, sales, marketing or procurement strategies, product development, margins, costs, capacity or production planning.

AEMO Forum and Meeting Expectations

This charter explains expectations regarding participation and behavior in the Australian Energy Market Operator (AEMO)'s stakeholder forums.

Meeting Expectations

All participants will:

- Respect the diversity of the group.
- Speak one at a time – refrain from interrupting others.
- Share the oxygen – ensure that all attendees who wish to have an opportunity to speak are afforded a chance to do so.
- Maintain a respectful stance towards all participants.
- Listen to others' points of view and try to understand others' interests.
- Share information openly, promptly, and respectfully.
- If requested to do so, hold questions to the end of each presentation.
- Remain flexible and open-minded, and actively listen and participate in meetings.
- Abide by COVID-Safe workplace guidelines, if attending a meeting on AEMO's premises.

Roles and Responsibilities

Forum stakeholders agree to:

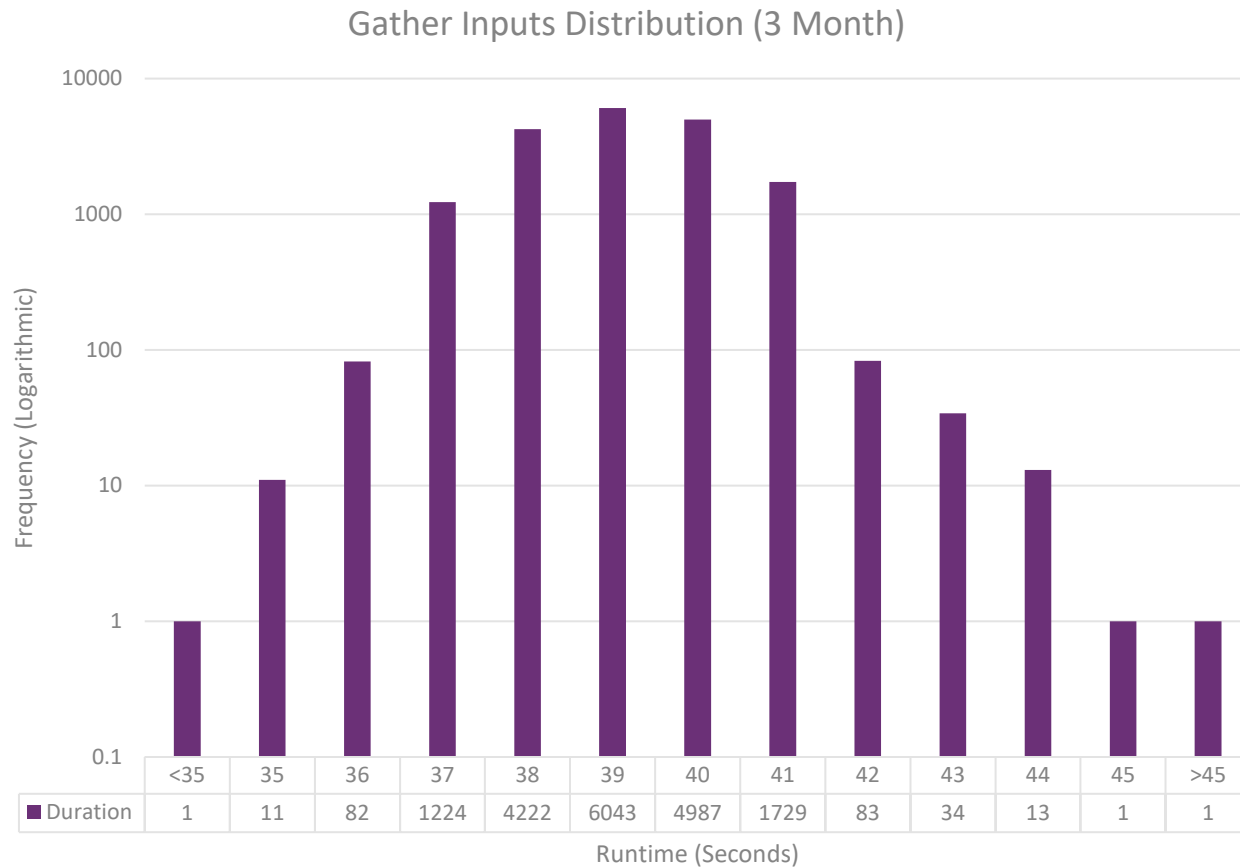
- Be specific and fact-based in their feedback on a specific workstream or emerging issue;
- Review and provide feedback on papers and reports;
- Relay information to their colleagues or constituents after each meeting and gather information/feedback from their colleagues or constituents, as practicable, before each meeting;
- Maintain a focus on solutions or outcomes that benefit all energy consumers.

AEMO agrees to:

- Provide technical expertise in a manner that is considerate of the audience and their level of expertise;
- Assist participants in understanding issues enough to represent their views;
- Provide all participants the opportunity to voice their views.

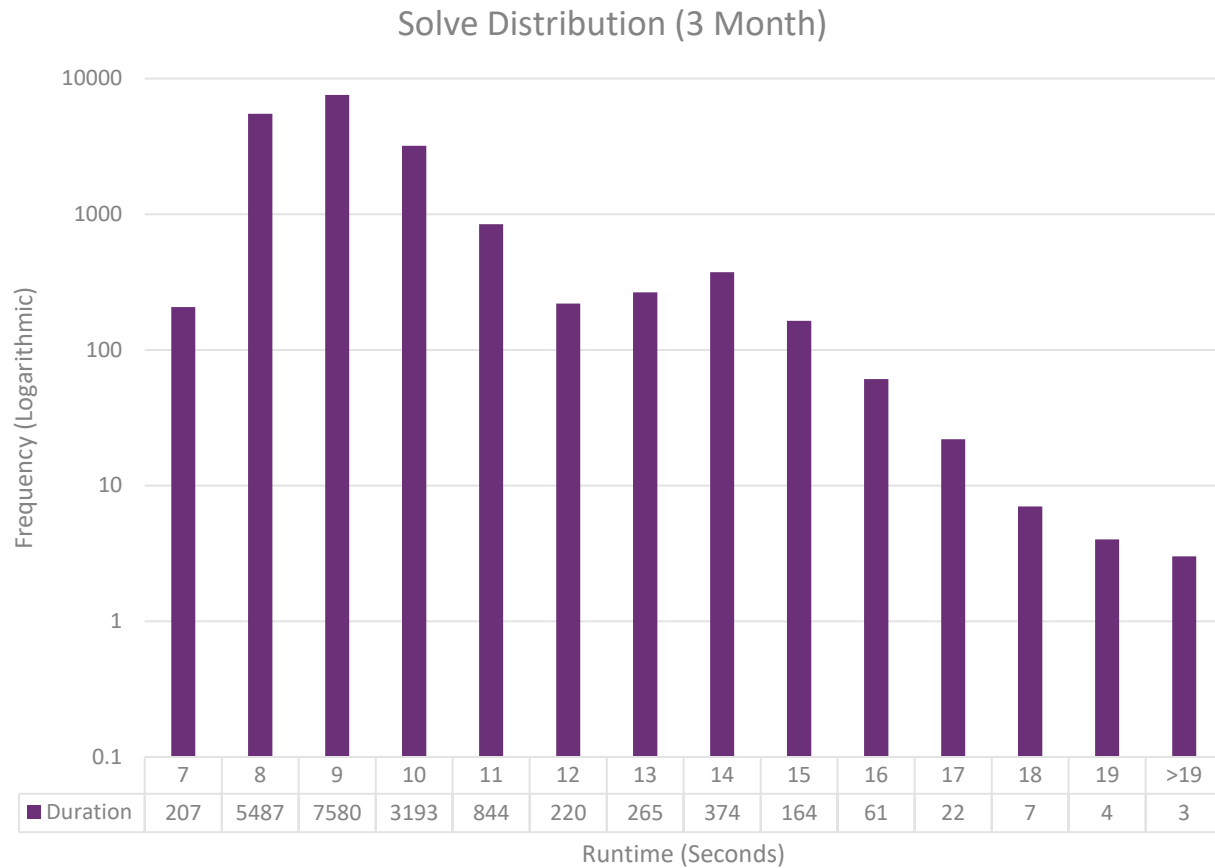
Appendix B: Additional Dispatch Timing Analysis

Appendix B1: Gather Inputs Analysis



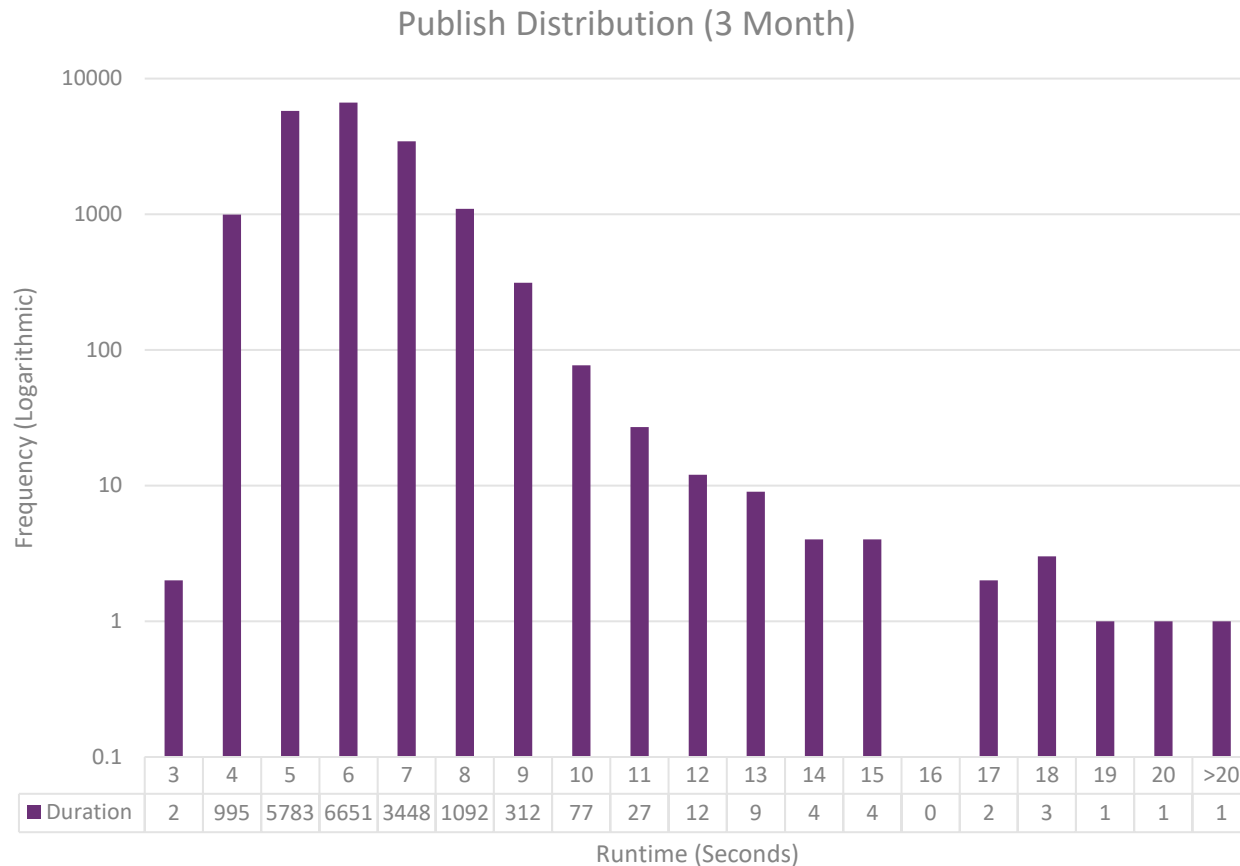
- Note does not consider when process started and logarithmic scale
- Consistent distribution
- Minimum is 29 and max is 54

Appendix B2: Solve Analysis



- Note does not consider when process started and logarithmic scale
- Rarely takes more than 16 seconds
- Maximum is 82 seconds so potential to go much later

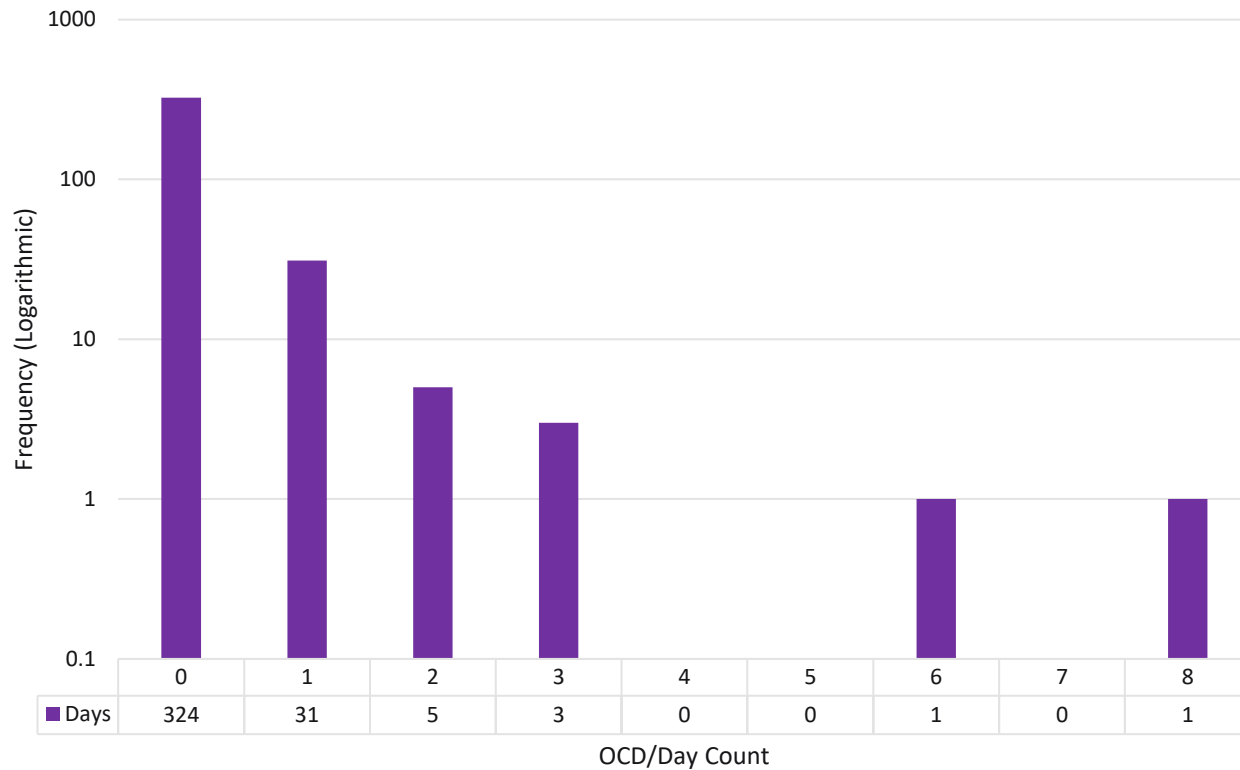
Appendix B3: Publish Analysis



- Note does not consider when process started and logarithmic scale
- Rarely takes more than 9 seconds
- Maximum is 46 seconds so potential to go much later

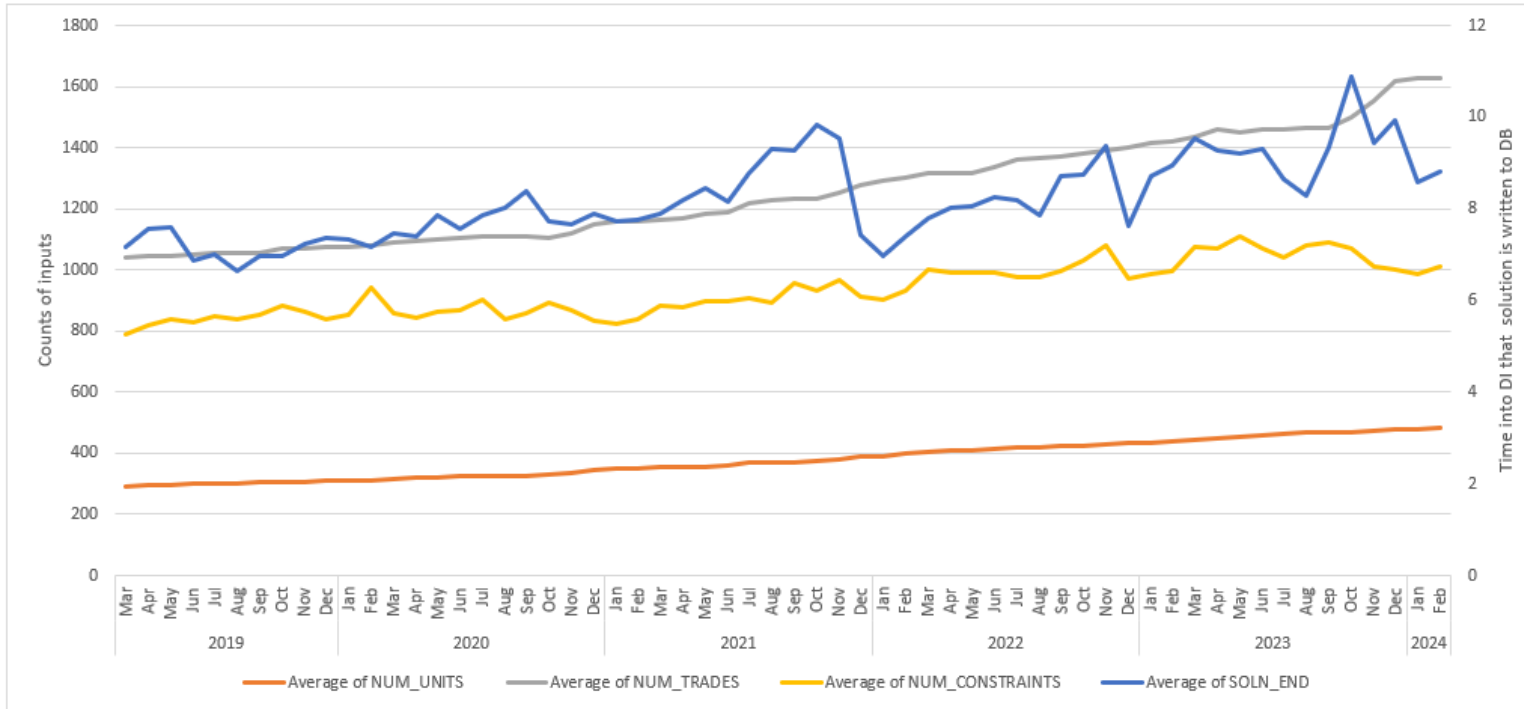
Appendix B4: OCD Rerun Analysis

OCD Per Day Distribution (2023)



- Most days have one
- Only 10 days had more than 1
- There were 15 OCD's on the 13th

Appendix B5: Over Time Analysis



- See Solution loader is taking longer but only a little
- Increase in Units, trades and constraints over time
- Noticeable spike near time of very fast FCAS market start but was not sustained



For more information visit

aemo.com.au