ST PASA Replacement Project

Stakeholder Meeting (30 Nov 2021)

Agenda

1. Objective of Project
2. Progress to date
3. Stakeholder feedback
4. Latest indicative timetable
5. Appendix A (Refresh of Proposed design)
6. Appendix B - Conceptual Architecture

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ST PASA Replacement Project

Objective: To do a holistic review of the PD/ST PASA methodology and develop a system that would serve the NEM now, and into the future.

Details and updates can be found on ST PASA Webpage

Progress to date

- Phase 1 completed
  - ✓ Initiate Industry consultation
  - ✓ High level business requirements
  - ✓ High level design (HLD)
  - ✓ Proof of Concept (PoC)
  - ✓ Conceptual Architecture Document (CAD)

Progress to date

Phase 2A commenced

- Tasks progressing in parallel
  - Development of detailed business requirements
  - Further development of uncertainty margins
  - RFP for the SCED and load forecasting module
  - AEMC Rule Change Consultation

Business Requirements

- Project team developing business requirements for the full ST PASA process
- Formal procedure consultation with external stakeholders to commence early in 2022. The procedures include
  - ST PASA Process description
  - Reserve Level Declaration Guidelines (RLDG)
  - Reliability Standard Implementation Guidelines (RSIG)
  - Spot Market Timetable (for frequency of PASA runs)

Forecasting: Uncertainty Margins

- The use of Uncertainty Margins to reflect uncertainties in load forecasts, VRE forecasts and scheduled unit forced outages is described in the High Level Design (HLD)
- A methodology to produce Uncertainty Margins is being developed. This methodology will be assessed as part of the next phase of the project.
  - Details of the methodology and the assessment will be discussed with all stakeholders during the consultation phase. This information will assist in determining appropriate initial confidence levels, used to calculate the Uncertainty Margin.

Request For Proposal (RFP)

RFP for the SCED and Load Forecasting module

- SCED – Security Constrained Economic Dispatch (See Appendix B)
- Load Forecasting Module – to disaggregate zonal load forecasts to nodal load forecasts
- RFP developed and sent out on 9th Aug 2021
  - Closed 24th Sept 2021
  - Progressing selection of vendor/s and understanding timelines

AEMC Rule Change consultation

- Rule Change proposal submitted (28th June 2021)
- AEMC submissions closed (23rd Sep 2021)
- Draft determination expected on 2nd Dec 2021
- The Rule change can be found on AEMC's website here

Stakeholder Feedback Themes

- Broadly support implementing changes to ST PASA and covering a 7-day period
- Support of publication of available capacity and PASA availability at a DUID level, except for one stakeholder who suggested this may result in incentives to exercise market power
- Support change of PASA availability definition to allow for more flexible recall times
- Mixed views on a principles-based approach to the Rules and including details in consulted on procedures. Several participants suggested the ST PASA procedure needs 'full' rules consultation

Stakeholder Feedback Themes

- Suggestions that ST PASA is and will be overly conservative and trigger 'early' RERT intervention
  - LOR triggers too conservative
  - Should cater for demand side response in determining reserve
  - Using Uncertainty Margin as input is double-counting
- PASA availability is confusing and difficult to use
- ST PASA modelling methodology be publicly available
- Suggestions that AEMO had disregarded "constructive criticisms" in its stakeholder consultation

AEMO's submission to AEMC consultation paper

- In response to stakeholder feedback, AEMO's submission to the AEMC's consultation paper provided further clarifications:
  - Scenarios demonstrating PASA availability and recall periods
  - How lack of reserve (LOR) conditions relate to ST PASA re-development
  - Full rules consultation to the development of procedures and the ability to have a full or single stage approach to future procedure changes

Rule Change: PASA Availability and Recall time

- Recall time to be flexible instead of fixed 24 hours
- Range of allowable recall time to be defined in the RSIG
  - Considering between 30 minutes and 72 hours
- Recall time to be provided for each trading interval for the corresponding PASA Availability value
- Submitted via the normal bids
- Considering removing the Gen recall portal to reduce duplication of work
  - Need to consider if need to keep the ability to submit two tranches of recall capacity and associated recall time

Recall time scenarios

Scenario 1

- 300 MW unit OOS for maintenance
- Require 72 hours' notice on first day, 5 hours' notice on the last day

Trading Interval	Max Availability (MW)	PASA Availability (MW)	Recall Period
1	0	300	72 hours
2	0	300	72 hours
…			
Last day	0	300	5 hours
	0	300	5 hours

Scenario 2

- 300 MW unit partially unavailable
- Require 40 hours' notice to return to full capacity

Trading Interval	Max Availability (MW)	PASA Availability (MW)	Recall Period
1	200	300	40 hours
2	200	300	40 hours

Scenario 3

- 300 MW unit fully available
- Bid lower for commercial or other reasons
- Can return to full capacity in 30 minutes

Trading Interval	Max Availability (MW)	PASA Availability (MW)	Recall Period
1	150	300	30 minutes
2	200	300	30 minutes

Use of PASA Availability

- Max Availability – either technical or commercial capacity available for dispatch
- PASA Availability – technical capacity that can be made available for PASA with x hours of notice (presently upto 24 hours)

- AEMO exploring the appropriate use of Max Availability versus PASA Availability in PD/ST PASA
- Potentially could produce results using both
  - Max Avail – reserve conditions if there is no market response
  - PASA Avail – to show how much market response is available (potentially, at a cost) for a forecast reserve condition
- To be further explored during procedures consultation

LOR/Intervention levels (TBD)

- Proposing that LOR declared as per Appendix A
  - This will be further consulted on
- LOR levels determined based on load deficits using Uncertainty Margins of different Confidence Levels
- The current 'FUM' will no longer be used
- Confidence Levels used will be consulted with Industry
  - AEMO will prepare backcast results showing load deficits at different confidence levels under the proposed methodology as part of the Industry Consultation.
  - Ensure in so far as practical that the LOR levels relate to the reliability standards

Declaration of LOR conditions

- Declaration of 'Actual' LOR conditions
  - 'Actual' LOR is based on results of first interval of PD PASA
  - Terminology is not ideal as availability is always a forecast not actual

- Considering appropriate terminology to be used for declaration of this condition

Demand Side Participation

- AEMO understands DSP will have increasing impact on reserves
- Impact of WDR is currently included and will be included in new PD/ST system (the capacity of WDR based on their Max Availability/PASA Availability, similar to treatment of scheduled units)
- Other DSP (including price responsive resources, or resources activated by network owners to manage network congestion) will initially be modelled implicitly in the new system via
    - The load forecast model, if the activation is correlated with weather conditions or calendar periods or;
    - The uncertainty margin, as the activation manifests as forecast error

Demand Side Participation

- Other market initiatives (i.e. scheduled lite*) are expected to deliver visibility and a framework for the treatment of non-scheduled generation and demand, which includes DSP (including price responsive resources). The PD/ST PASA system will be updated accordingly.

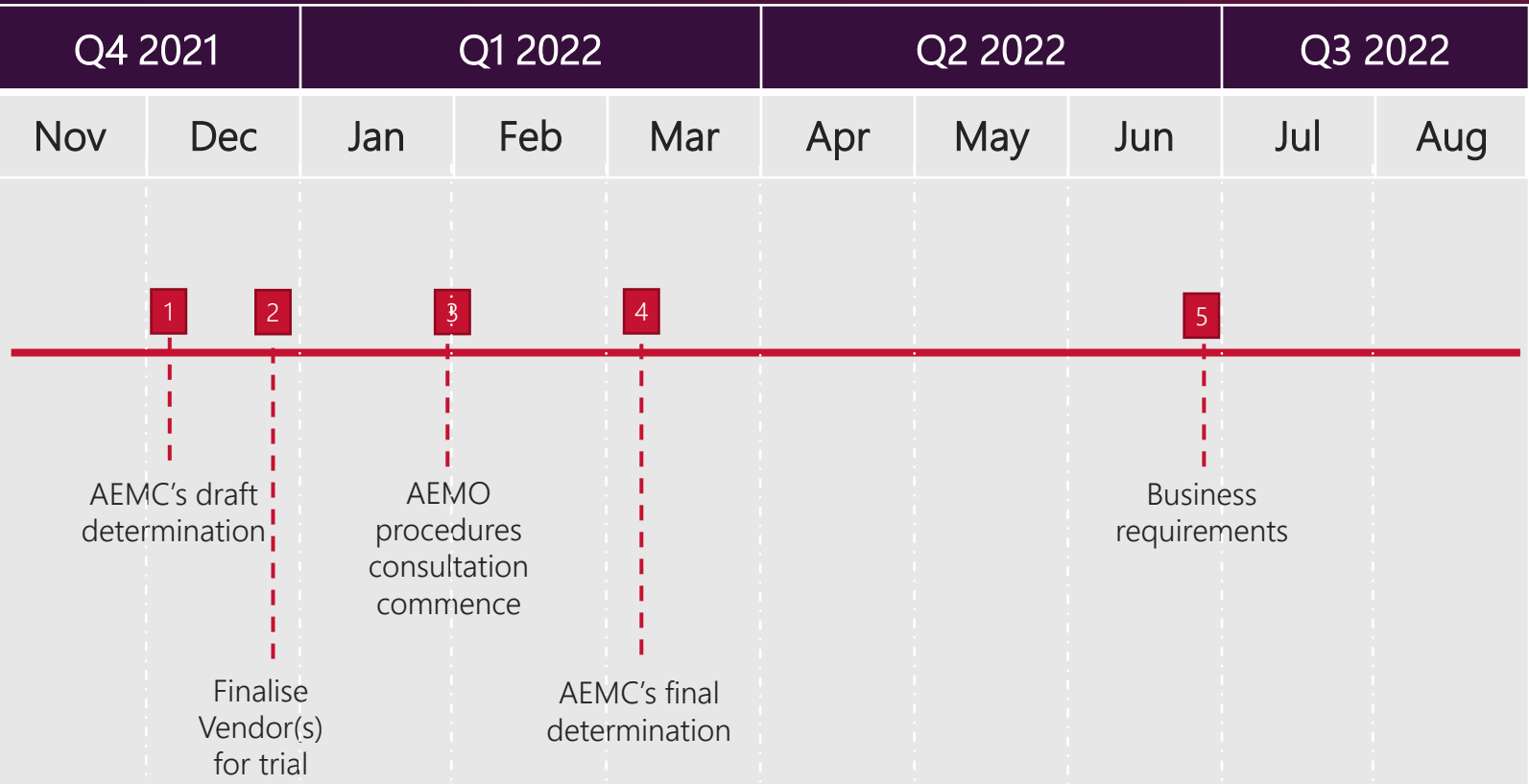
*ENERGY SECURITY BOARD Post-2025 Market Design Final advice to Energy Ministers Part B, Page 87, Available here: https://esb-post2025-market-design.aemc.gov.au/reports-and-documents

Technical Availability for semi-scheduled units

- A stakeholder has requested that AEMO publish forward-looking technical availability* for semi-scheduled units
- If the AEMC considers it appropriate, AEMO is able to provide this information with the following caveats:
    - There is no "reason" field collected or published when participants change their technical availability
    - There is no direct field identifying which submission was used in the creation of the UIGF used by PD/ST PASA
        - Stakeholders will need to trace the technical availability submission to the pre-dispatch/STPASA run by comparing the *offerdatetime* of the submission to the rundatetime of pre-dispatch/STPASA

* Technical availability includes Upper MW limit and the elements available information submitted by participants in the EMMS Web Portal

Latest Indicative timetable



ID	Indicative date	Key activity
1	2 Dec 21	AEMC draft determination
2	Dec 21	Finalise vendor(s) for trial
3	Q1 2022	AEMO procedures consultation
4	10 Mar 22	AEMC's final determination
5	Q2 2022	Business requirements complete (including procedures consultation)
6	TBA	Detailed design and implementation
7	TBA	Go live

‘Go-Live’ date

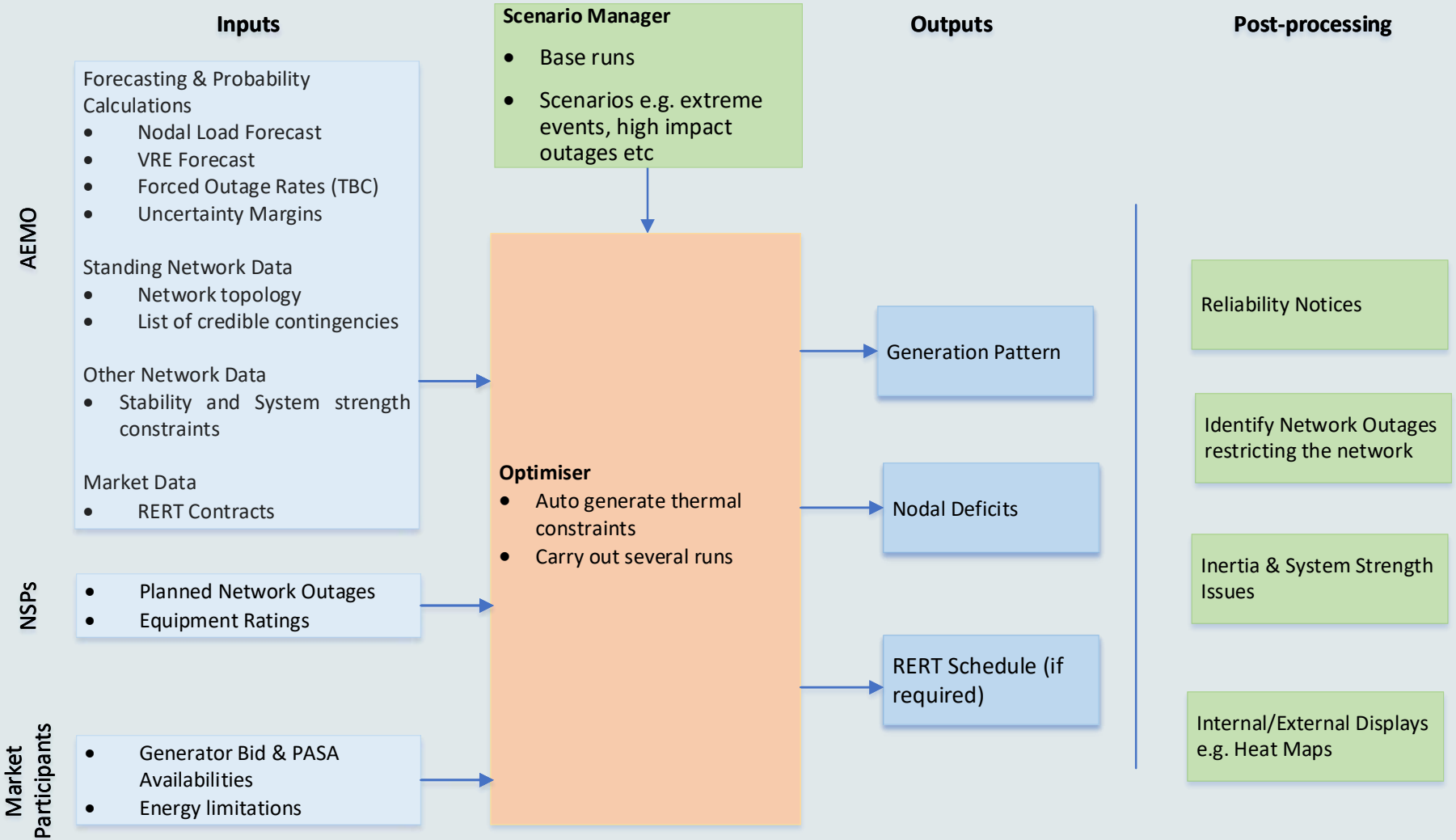
- ‘Go-live’ in Q3 2022 is not achievable
- AEMO is reviewing the timelines considering:
  - Availability of specialised external and internal resources. AEMO is currently considering the RFP responses and timelines provided
  - Detailed requirements of external stakeholders as part of the ‘formal’ procedure consultation process
  - Timelines required by participants to make changes to their systems to work with the new ST PASA
  - Relationship between the ST PASA implementation and IESS, to identify efficiency opportunities e.g., the bidding interface
- AEMO has informed the AEMC that the new system may not be in place until at least Q3 2023

Appendix A (Refresh of proposed design)

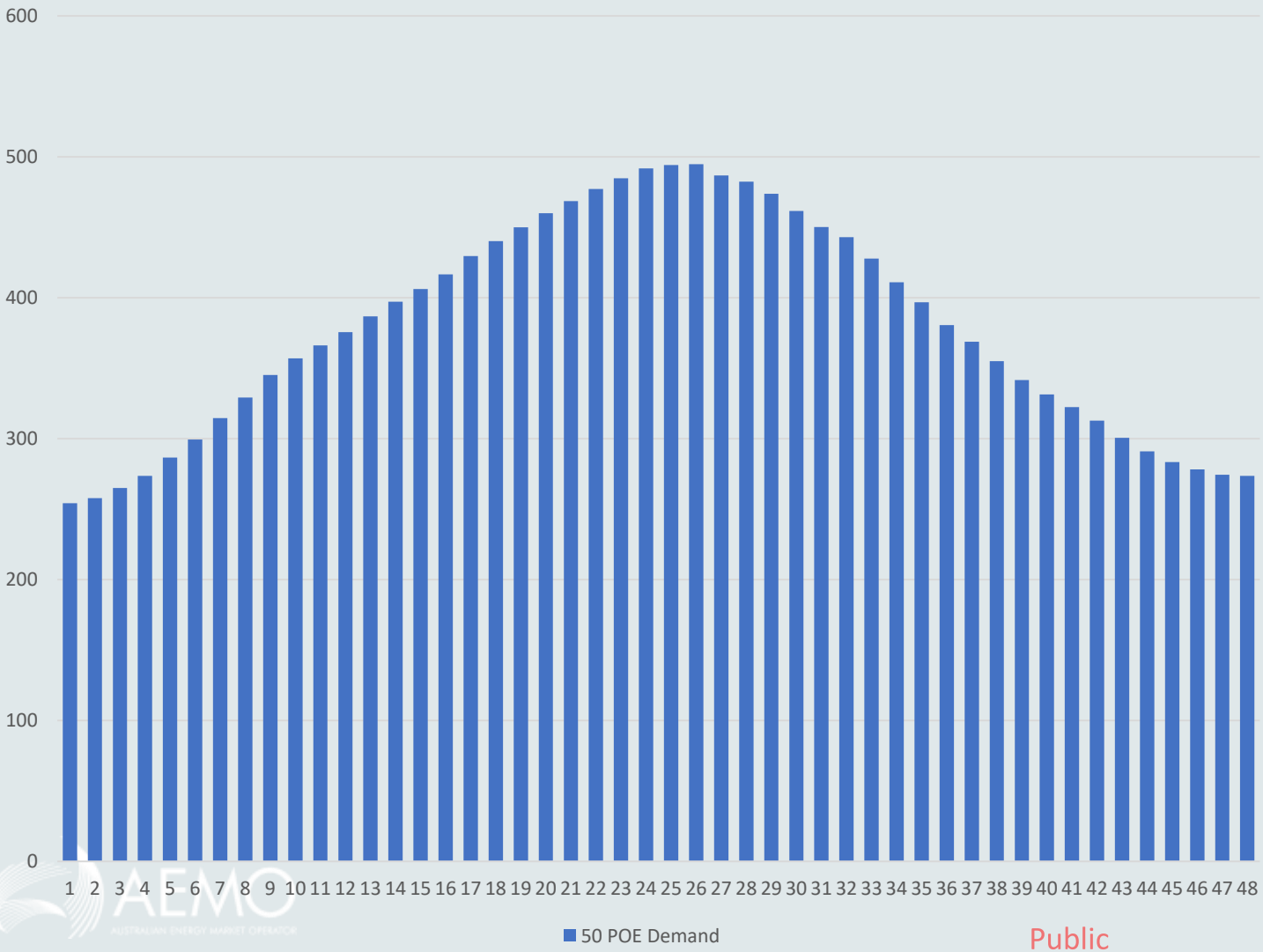
Key themes of HLD

- Reliability is a physical system issue hence the model should reflect the physical reality instead of the market
  - Full network model
  - Forecast at nodal level (load on bus)
- Determine uncertainties in demand forecast, VRE forecasts and scheduled unit forced outages
  - They become an input into the model (known as 'Uncertainty Margins')
  - Current 'FUM' no longer used

New PD/ST PASA System



Determination of Reliability



	Proposed System
Objective	Create generation profile that meets the demand at the node
Subject to	n-1 security constraints (Transmission and generator contingencies)
Demand Used	50% POE demand + Uncertainty Margin
Reliability Measure	Deficit = Uncertainty Margin + 50% POE Demand - Gen
LOR Declared	Deficit > 0

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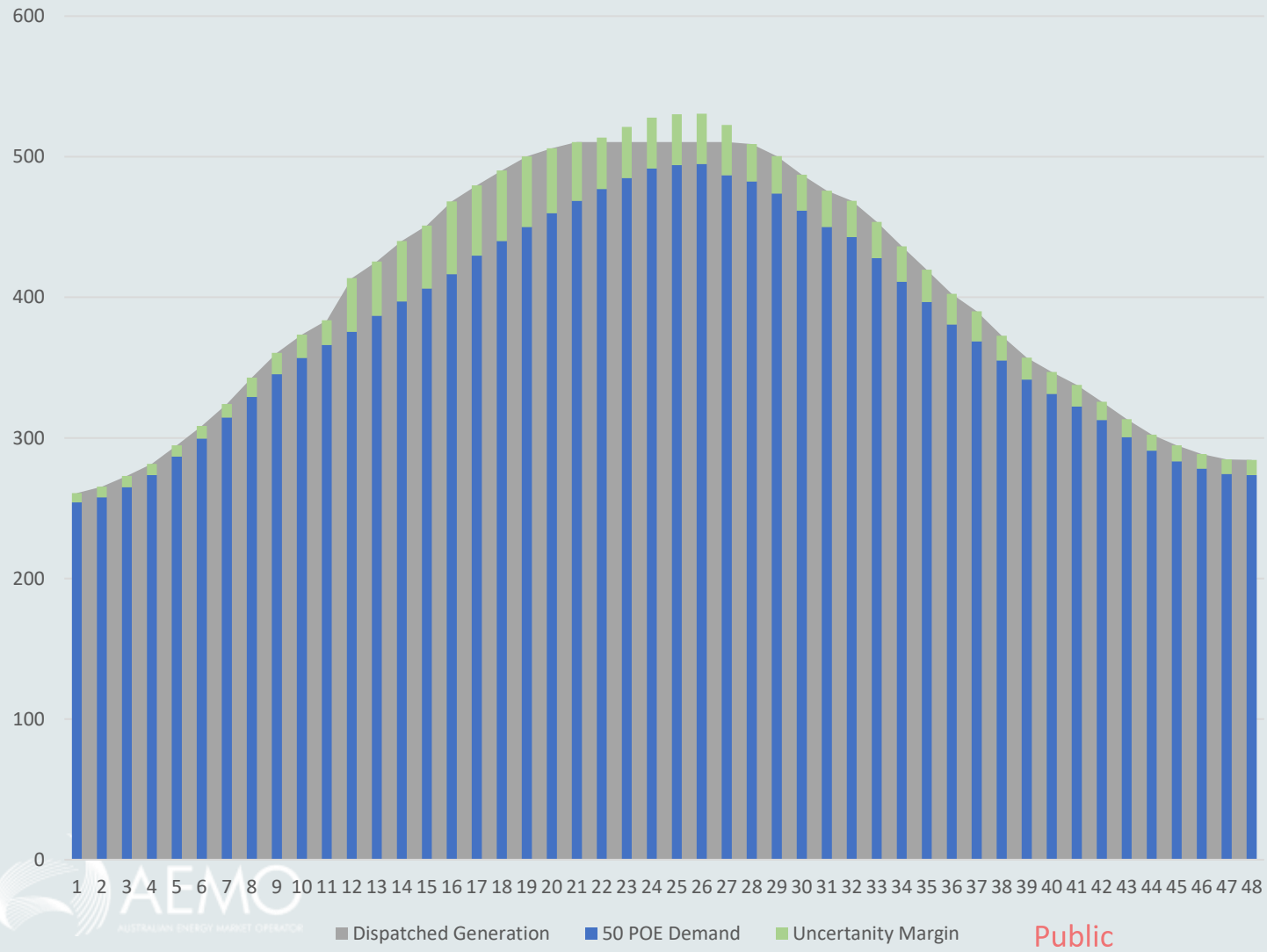

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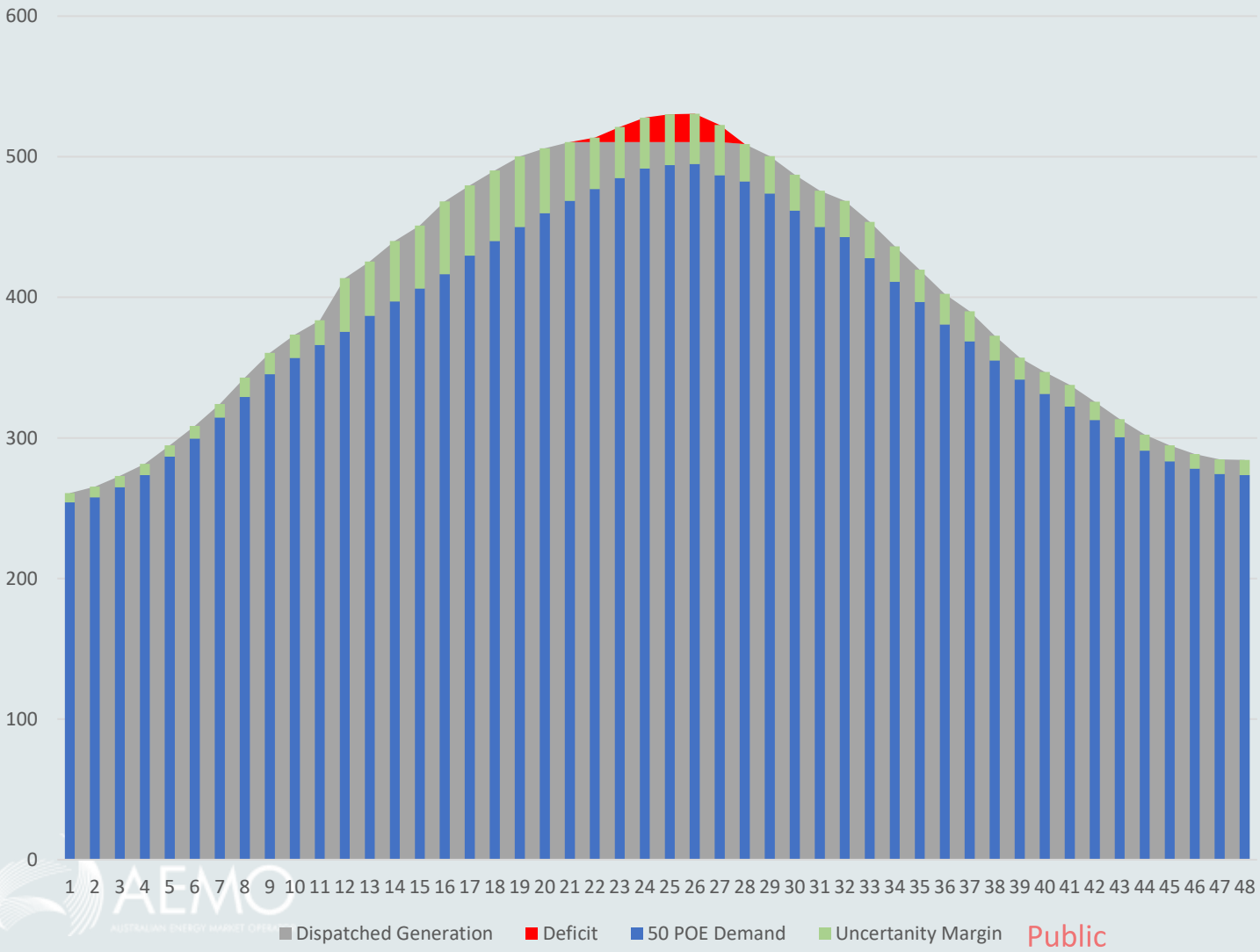

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Proposal for LOR Levels

Current ST PASA		Proposed System	
Current LOR Levels	Intervene in Market?	Proposed LOR levels	Intervene in Market?
LOR 3 – Cannot meet demand if we have a credible network contingency	Y	LOR RED – Cannot meet demand if we have a credible network contingency OR a credible generator contingency in the NEM Demand = 50 POE demand plus Uncertainty Margin at x%[1] confidence level	Y
LOR 2 – Cannot meet demand if we have a credible network contingency OR a trip of the largest generator (in that region) (FUM is also considered at this point)	Y		
LOR 1 - Cannot meet demand if we have a credible network contingency OR a trip of the largest and the second largest generator (in that region) (FUM is also considered at this point)	N	LOR ORANGE – Cannot meet demand if we have a credible network contingency OR a credible generator contingency in the NEM Demand = 50 POE demand plus Uncertainty Margin at y% confidence level (where y>x)	N
[1] x% is the AEMO intervention level		LOR YELLOW – Cannot meet demand if we have a credible network contingency OR a credible generator contingency in the NEM Demand = 50 POE demand plus Uncertainty Margin at z% confidence	N

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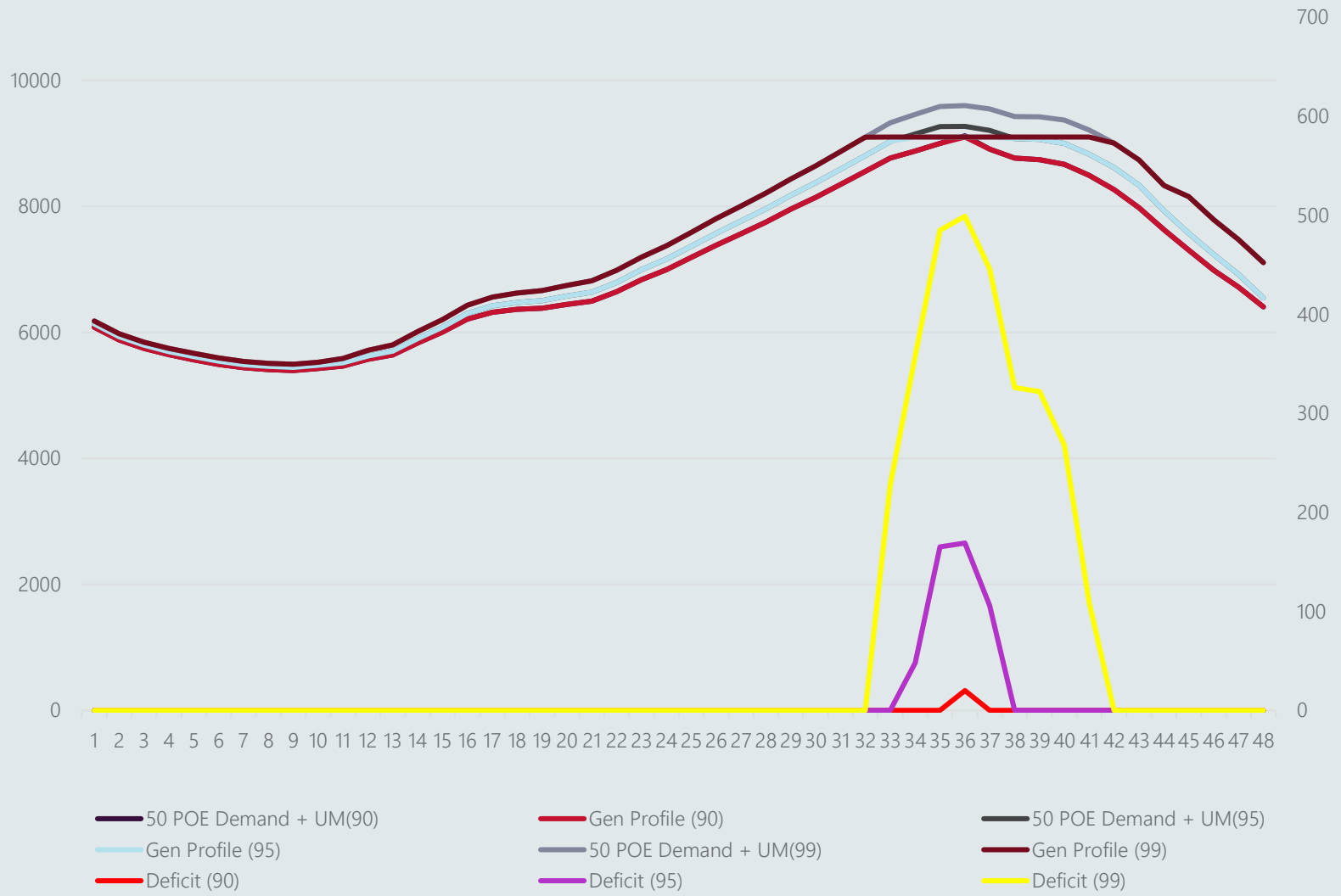
Proposal for LOR Levels



Example above would be
LOR RED for Interval 36
LOR ORANGE for Intervals 34,35 & 37
LOR YELLOW for Intervals 33, 38 - 41

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Appendix B
Conceptual Architecture