2022 MASS Consultation review

Forum 2

Systems Performance – Q3 2022

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, present and emerging.

Please note that this forum will be recorded for the purposes of assisting AEMO accurately capturing feedback.

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 behaviour 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:

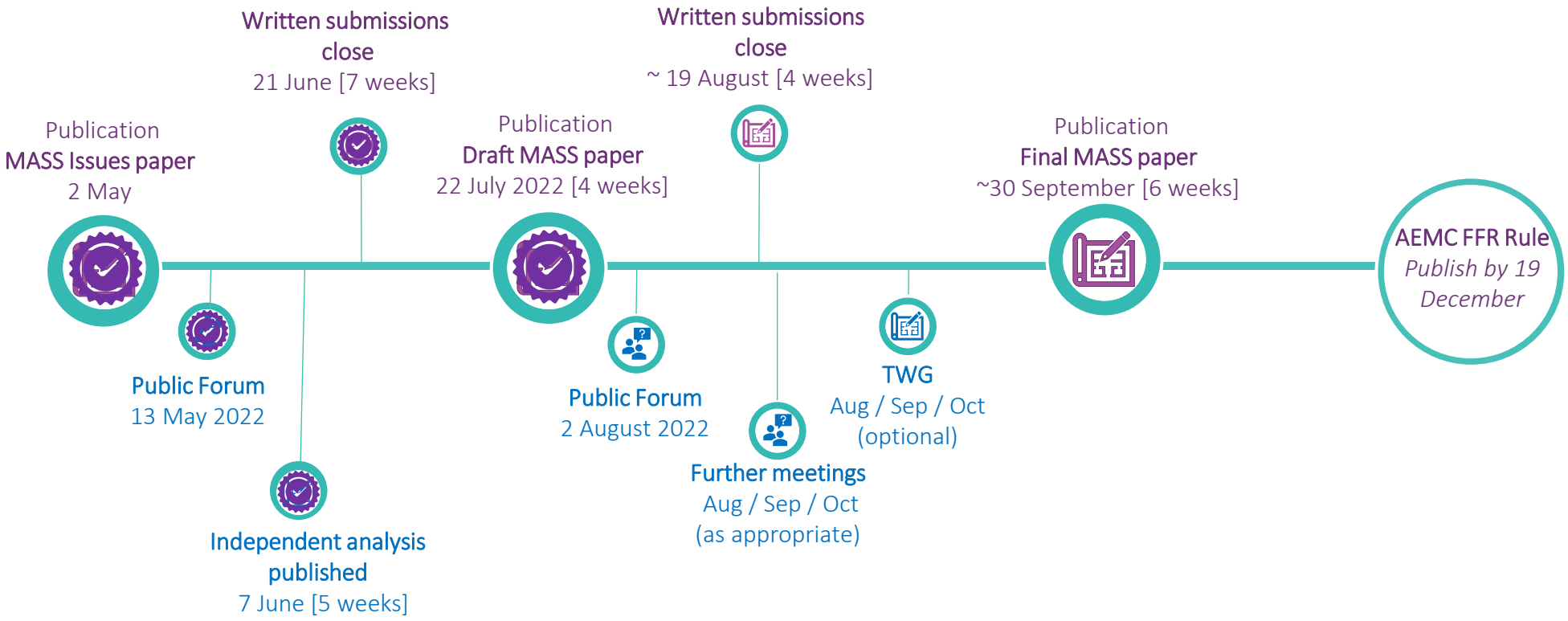
- Provide technical expertise in a manner that is considerate of the audience and their level of expertise;
- Assist participants in understanding issues enough to represent their views;
- Provide all participants the opportunity to voice their views.

Welcome & Introductions

- The purpose of this forum is to support understanding of the MASS consultation Draft Determination and Draft MASS, and provide an opportunity for discussion and Q&A on the items presented in the documents.
- This forum does not replace the formal written submissions process – we encourage all stakeholders to provide formal submissions by 5.00pm (AEST) on 19 August 2022.
- To support discussion during this forum, we ask all attendees to please raise their hand when they intend to speak and be respectful to others speaking.
- Please introduce yourself (name & organisation) before you speak.

Consultation stage overview

MASS Consultation timeline



Guided by rules consultation procedure
Optional activities

Overview

- Issues Paper identified proposed key parameters and supporting principles
- 13 valid submissions in the first stage of consultation
- Draft Determination identified proposed Very Fast specifications in the Issues Paper were generally supported and the following requirements were maintained:
  - 1-s response time
  - Fast frequency ramp of +/-1 Hz/s
  - Reference frequency level of +/-0.5 Hz to determine Very Fast FCAS capacity delivered
  - Inertia will not be counted as Very Fast FCAS
- Presentation will cover the key proposed changes to the MASS and the reasons behind them.

Questions?

Draft Determination summary

Key Updates

- FCAS attributes
  - Response time for Very Fast FCAS
  - Compressed timeframe for Fast FCAS
- Changes to specifications
  - Cap to registered FCAS capacity based on peak active power change to negate impact of ‘Multiplier’ effect
  - Narrow dead-band adjustment and reverting the start of an assessment to Frequency Disturbance Time
- Measurement requirements and controls
  - Sampling rate for Very Fast FCAS
  - Applicable discount for lower sampling rate
  - Certification requirements for FCAS meters
  - Maximum scan rate to respond to changes in Local Frequency

FCAS attributes

FCAS attributes

- Response time for Very Fast FCAS
  - 1-s response time was generally supported, while 0.5-s quite challenging
  - Several suggestions of 2-s response time, argued on potential of more participation
  - AEMO conducted studies that showed a 1-s service would be significantly more useful than a 2-s service in likely future conditions
    - Note buying additional 2-s service is not the same; no service might be delivered by 1-s
- Compressed timeframe for Fast FCAS
  - 1-s to 6-s timeframe was generally supported
  - Some concerns about ‘missing’ second -
  - 7-s to 10-s range extended timeframe was suggested
    - Potential for some facilities to register more Fast FCAS, but not quantified or put in context of likely future availability
    - Would require re-assessment of all facilities; extensive work and timetable risk while benefits not clear. Many participants asked AEMO to specifically avoid this if possible.
    - Extended timeframe need not be paired with Very Fast FCAS work

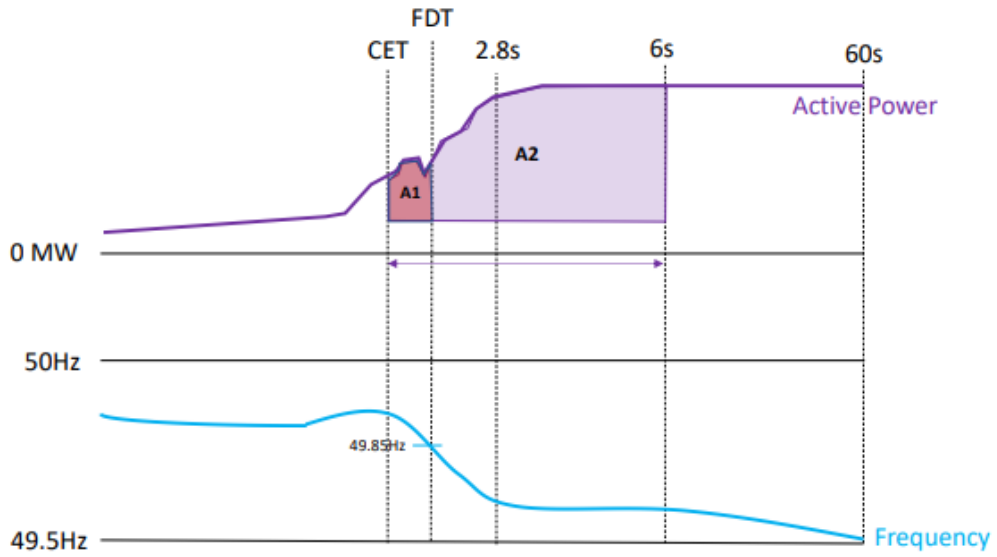
Changes to specifications

Proposed MASS changes

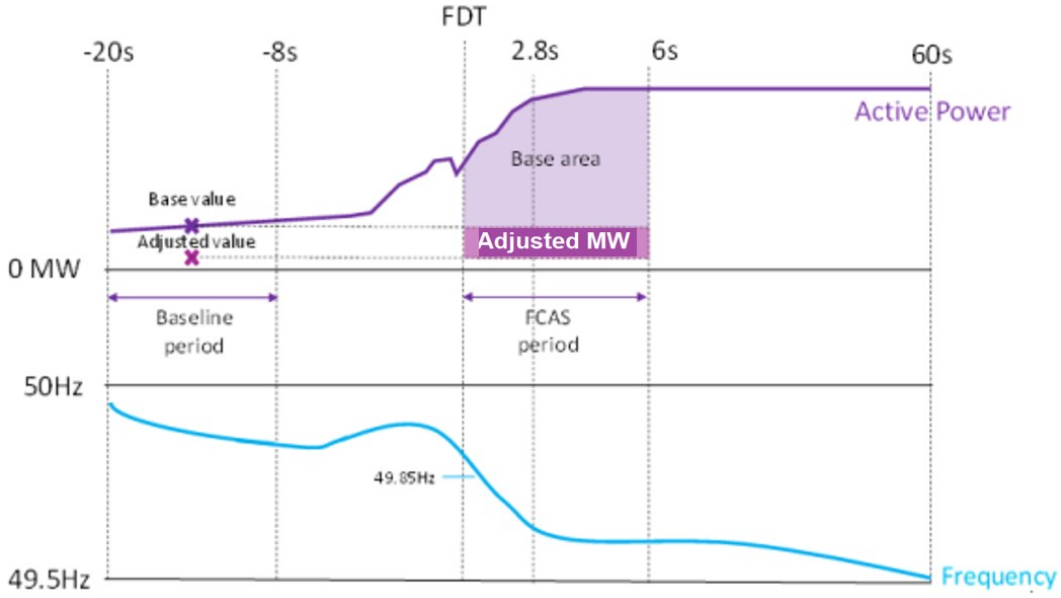
- Negating impact of multiplier effect
  - New studies demonstrate impact of multiplier effect on potential Mainland frequency nadir
  - Accelerated response of FCAS facilities will be recognised by the Very Fast FCAS markets
  - Allowing the gap to increase between the change in active power following a contingency and the size of the contingency could lead to major breaches of the FOS and impacts to power system security
- Reverting to Frequency Disturbance Time
  - Discontinue use of Contingency Event Time (CET) and revert to Frequency Disturbance Time (FDT) as start of FCAS measurement to simplify process and aid independent assessment
  - Introduce a narrower dead-band adjustment to recognize frequency response of variable FCAS controllers operating with dead-bands within NOFB
  - Clarified that Fast FCAS capacity delivered is **not** based on the change in active power between the CET and the 6-s point, but rather on the time average response i.e. the change in active power **over time** between the CET and the 6-s point**.**

Proposed MASS changes – FDT and narrow dead-band adjustment

Time Average response between CET and 6 s past FDT



Time Average response between FDT and 6 s past FDT plus narrow dead-band adjustment



Proposed MASS changes – FDT and narrow deadband adjustment

- Narrow deadband adjustment
  - expected response at average frequency ‘basic response’ timeframe (i.e. the calculated pre-disturbance output)
- Expected response based on facility’s ‘proportional response function’
- REFFREQ = Average of frequency measurements between FDT-20s and FDT-8s
- $\Delta P = Pmax * \frac{(REFFREQ - deadband)/50}{Droop\ (\%)}$
- FCAS Provided = FCAS (as measured from FDT) + ΔP

Questions

From	Question
SwitchDin	1. In relation to 6.2.2(e) "The FCAS Facility used to deliver the required Contingency FCAS must have a control system to reserve the necessary headroom or footroom required for the delivery of frequency response whenever Contingency FCAS is enabled." Can you please clarify whether headroom/footroom for each individual asset in a VPP needs to be physically reserved or whether a statistical approach across the entire VPP fleet would be acceptable? Would physical reservation of both energy (kWh) and power (kW) be required?
Delta Electricity	2. What was the previous reason for having a trigger rate in the specification as to whether a record would need to be captured? In revisiting the MASS and the events as occurred on 17 June 2022 (and other days in June) has there been any further considerations relevant to this history?
Shell Energy	3. The draft determination sets out that capacity is “capped by reference to the peak active power range” – does this mean that BESS will be able to register for more than its name plate rating?

Questions?

Measurement requirements and controls

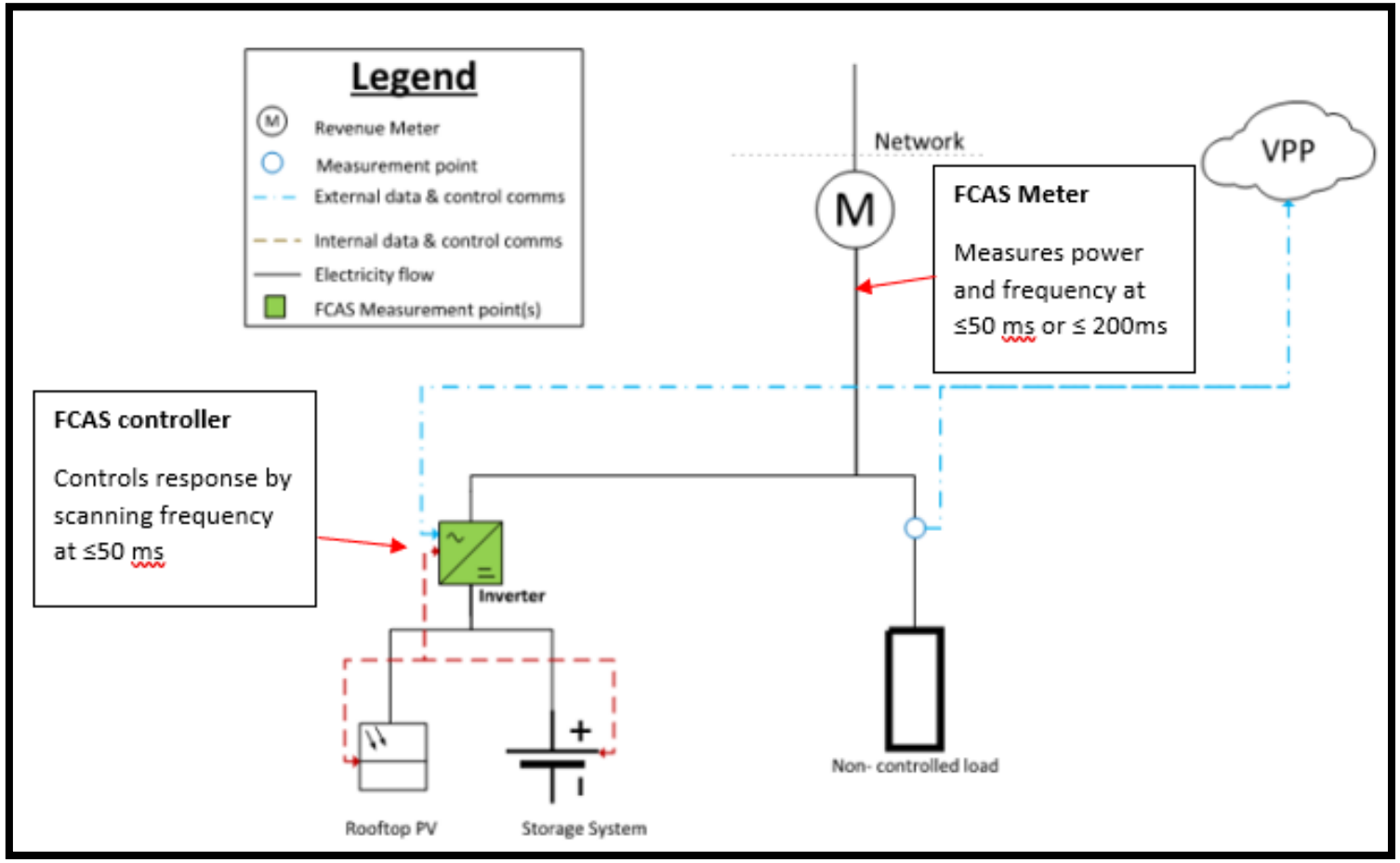
Very Fast FCAS measurement arrangements

- Determining the adequate sampling rate for Very Fast FCAS
  - AEMO proposed a 100 ms sampling rate for large aggregators with an initiation delay of ≤500 ms
  - At least one submission appeared to clearly support a 50ms sampling rate
  - AEMO does not consider that a sampling rate of 100ms with the application of a discount will result in FCAS being under-delivered
  - Unlike Fast FCAS, the discount for Very Fast FCAS is required for any size of aggregation
  - AEMO considers that the proposed sampling rate will be in the best interest of consumers.
- Consideration of the analysis from The University of Melbourne on verification error
  - Slower sampling rate, delays to initiate the FCAS response, and the FCAS controller type all have an impact on the verification error
  - Proposed discount for aggregated FCAS facilities with a sampling rate >50 ms but ≤100 ms is based on the initiation delay and whether the controllers are switched or variable.

Metering and controls requirements

- Certification requirements for FCAS meters
  - Suggestion from two submissions that the National Measurement Institute should be consulted on the metrology for Very Fast FCAS
  - Review on the current measurement requirements of the MASS completed by Independent metering expert, and key recommendations accepted by AEMO
  - FCAS metering equipment types to be certified to the IEC 61557-12 standard
  - Certification will ensure that measurements of power and frequency are captured adequately
- Maximum scan rate for FCAS controllers
  - Rate of detection to changes in frequency and measurement sampling rate must not be confused with one another
  - Scan rate requirement introduced to clarify that there should be no linkage between the response from the FCAS controller and the measurement sampling rate

Example of FCAS metering and FCAS controller location



Questions

From	Question
SwitchDin	1. In relation to 6.2.2(d) "The control system of a Variable Controller or a Switching Controller, or a discrete combination of both, must scan for changes in Local Frequency at a rate of ≤50 ms and automatically cause the FCAS Facility to deliver the required amount of Raise Response or Lower Response". Can you please provide clarification on what this means, and whether it applies to all contingency FCAS markets?
	2. In relation to 5.7.(a) "The type of equipment capturing measurements of power and frequency must be certified to the sections of the IEC 61557-1213 standard specified". Has consideration been given to the type of equipment required to meet this standard, and the cost implication?
The University of Sydney	3. To evaluate the performance of the Very FFR from various distributed resources, such as aggregated battery contributions from VPP, which frequency measurement point will be used? As VPP bids into the market with the aggregated power, but batteries at different locations may feel the frequency deviation to different extents with different time delays, how will the total performance of VPP be evaluated? Will the local frequency measurements be used?

Questions

From	Question
The University of Sydney	4. Where is the measurement point on the power used for evaluating the power contribution of VPP in Very FFR? Will the net load be used against the bid or the battery outputs only be used? As the household load is unpredictable, has AEMO factored this consideration into evaluating the performance of VPPs?
	5. Just to confirm that 50ms is the requirement put on the measurement and is not related to any control response time. There are no specifics on the frequency response time from AEMO as long as the maximum power can be reached within 1s?
Shell Energy	6. Scan rate – is AEMO's intention to increase the scan rate for VPP fast FCAS? Our concern is that for fast FCAS participants in a VPP it could be an issue to have a scan rate <200ms as it may introduce the need for additional hardware for some sites.

Questions?

Close and next steps

Please ensure any formal submissions are sent to mass.consultation@aemo.com.au by 5.00pm (AEST) on 19 August 2022.

Thank you for your participation in this forum and the consultation.

For more information visit

aemo.com.au