Proposed revision to the Balancing Merit Order tie-break rules – Minimum STEM Price

WEM APC Working Group
20 February 2020

Purpose and Background

- Purpose
  - AEMO's proposed revision to the Balancing Merit Order (BMO) tie-break methodology
  - What it means and how it works
- Background
  - On Saturday 12 and Sunday 13 October 2019, the Balancing Price cleared at the Minimum STEM Price for the first time
    - Three intervals
    - Low demand was the main contributor to this price event, with operational demand dropping to an all-time minimum of 1,159 MW
  - Clearing at the price floor raises concerns for generator de-commitment and system security
  - AEMO's initial proposal discussed at stakeholder workshop on 3 December 2019
    - Current proposal incorporates stakeholder feedback

BMO order

- The objective of the Balancing Merit Order (BMO) appears to be to dispatch the lowest-cost combination of Facilities [WEM Rule 7A.1.3(b)]
  - Assuming no security constraints
- The BMO is determined by WEM Rule 7A.3.2:
  - Convert all prices to Loss Factor Adjusted Prices except for the Balancing Portfolio
    - Loss Factor Adjusted Price: Means, in respect of any price, that price divided by any applicable Loss Factor for the relevant Facility but any resulting price exceeding the Price Caps, must be adjusted to the relevant Price Cap
    - This means the lowest Loss Factor Adjusted Price is -$1000
  - Sort lowest to highest by Loss Factor Adjusted Price
  - Break ties as specified in the Market Procedure: Balancing Market Forecast

Current tie-break process

- Tie-break process in the Procedure:

  4.2.1 Prior to the start of each Trading Day, AEMO must assign a unique random number to each Balancing Facility, including the Balancing Portfolio

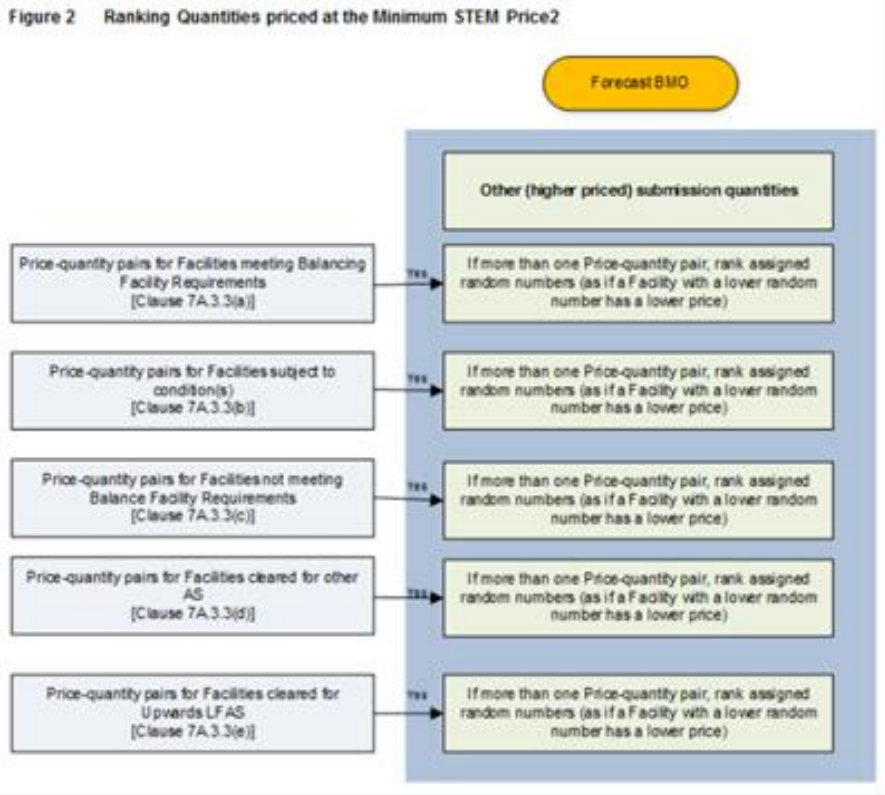
  4.2.2 When AEMO is required to assign priority to break a tie for a Trading Interval in which a tie occurred, AEMO will:

  (a) where that price equals either the Alternate Maximum STEM Price or the Maximum STEM Price, sort the affected Price-Quantity Pairs as if the Facility with the highest random number had the highest price;

  (b) where that price equals the Minimum STEM Price, sort the affected Price-Quantity Pairs, as if the Facility with the lowest random number had the lowest price; and

  (c) where that price does not equal the Minimum STEM Price, the Maximum STEM Price or the Alternate Maximum STEM Price, sort the affected quantities in ascending order as if the Facility with the lowest random number had the lowest price.

- However, on 1 July 2019, the Rules and the Procedure changed, and now doesn't align with WEMS ordering at the maximum or minimum price
- The actual order used at the Minimum STEM Price is shown in the diagram
  - Facilities assigned to categories
  - Within each category, ordered randomly



Proposed tie-break methodology at the Minimum STEM Price

- Issue: currently can't differentiate energy supplied at the Minimum STEM Price (which can be curtailed) from true minimum generation (which requires desynchronisation)
- AEMO proposal:
  - Allow Minimum Generation to be bid as a separate tranche from other energy at the Minimum STEM Price
  - WEMS includes a new code to differentiate
  - No system validation – compliance approach
- The best fit to the optimal dispatch order at the Minimum STEM Price (accounting for stakeholder feedback) comes from:
  - Categorising Balancing Price-Quantity Pairs by type of energy provision, then
  - Ordering categories, then
  - Within each category, sorting as per the existing approach: use the random number

Category (order of solve, highest to lowest)
Energy above minimum generation (for Non-Scheduled and Scheduled Generation)
Non-active Balancing Facilities
Minimum generation where no Ancillary Services provided
Other Ancillary Service (AS) – AS requirement and minimum generation
LFAS - LFAS requirement and minimum generation

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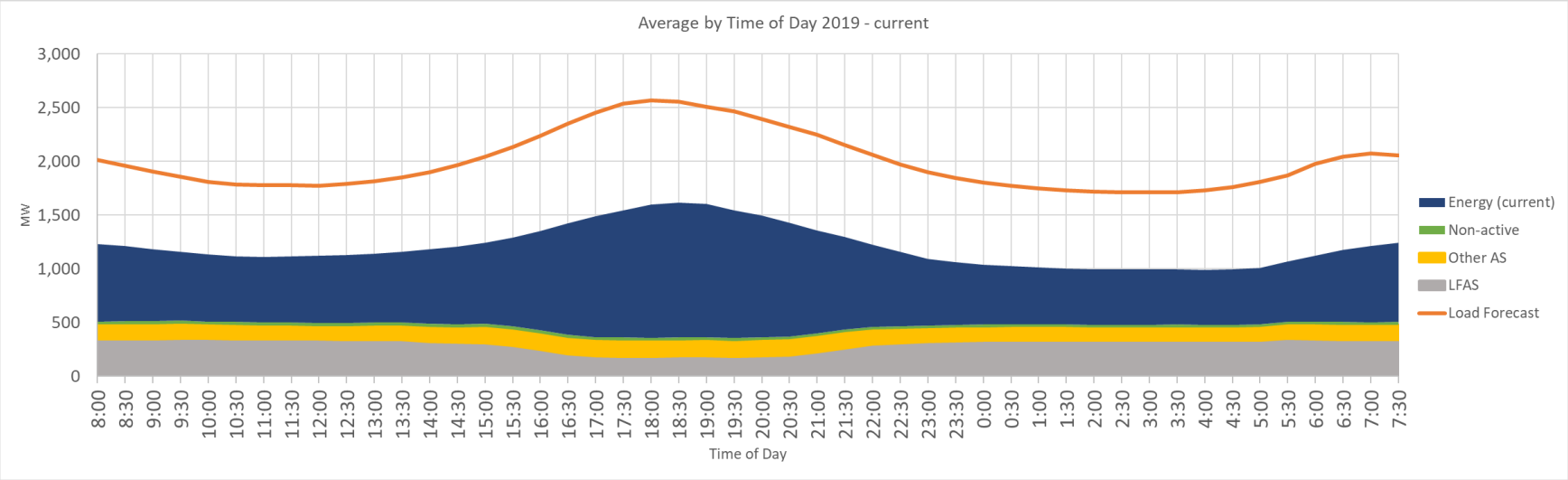
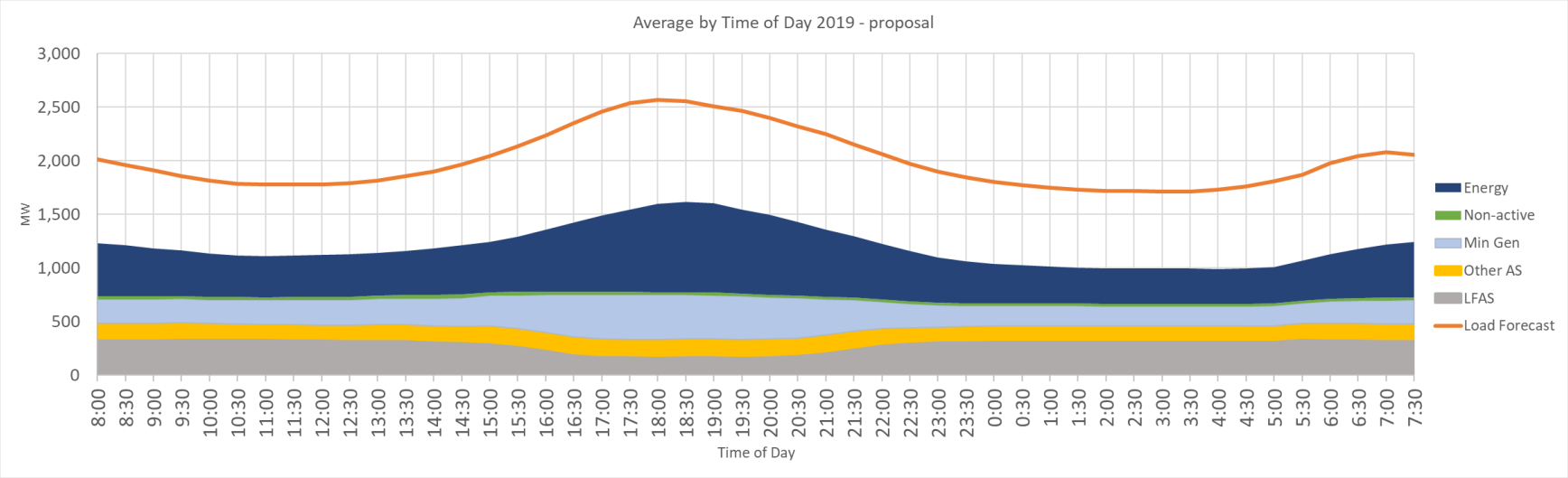
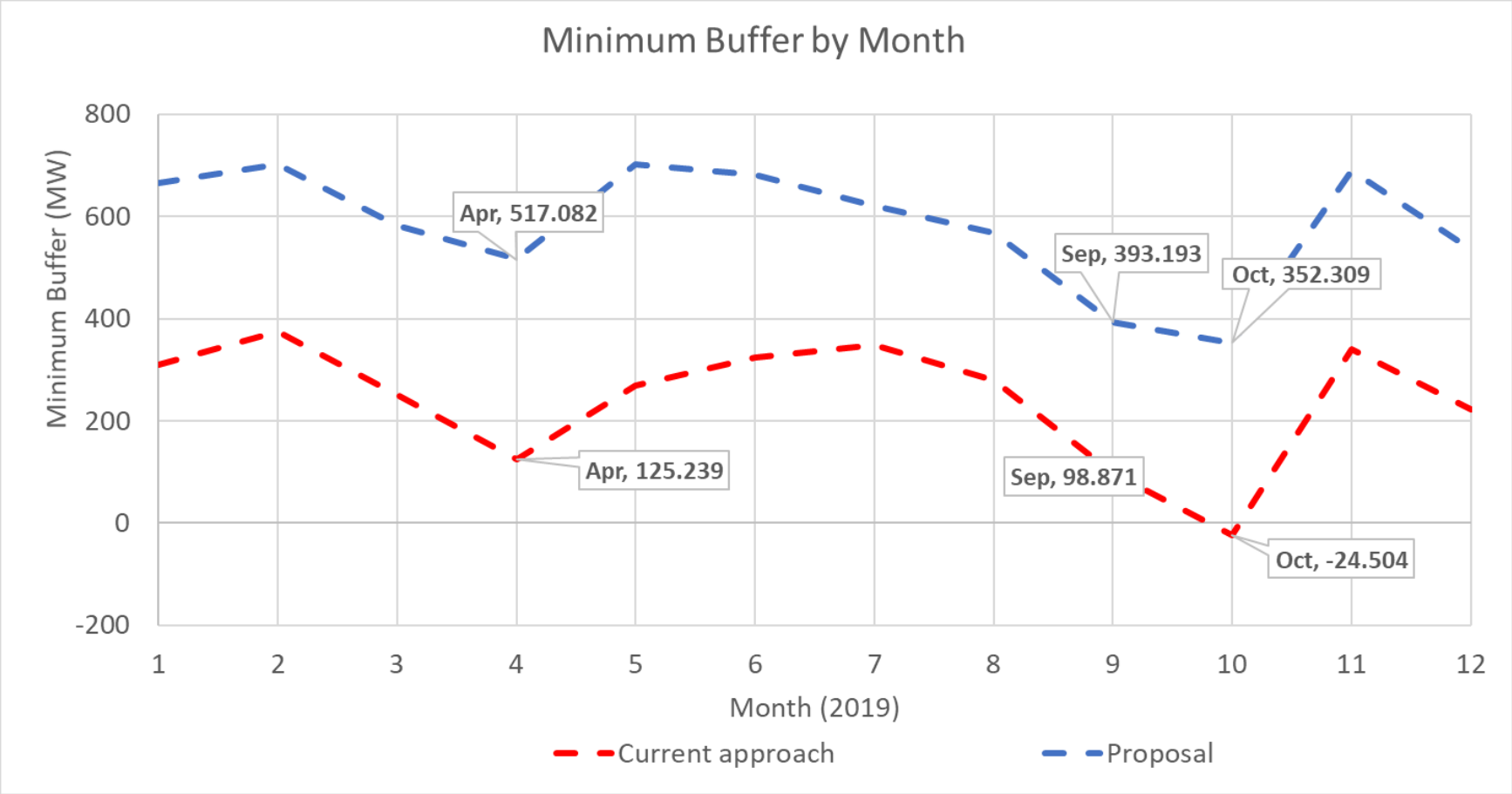
Outcomes at Minimum STEM Price (1)





Outcomes at Minimum STEM Price (2)



Approach

- Add permission and obligation to the Market Procedure: Balancing Facility Requirements – new step 2.1.5:
  - Participants may include a Balancing Price-Quantity Pair in the Minimum Generation Category at the Minimum STEM Price
  - If so, the quantity of the Balancing Price-Quantity Pair must not exceed the Facility's minimum stable loading level in Standing Data
- Revise Market Procedure: Balancing Market Forecast to:
  - Specify the categories (note these were omitted from the existing Procedure)
  - Include the new Minimum Generation category
  - Clarify the ordering within each category remains as current – using the random number generated daily for each Facility
  - No changes to tie-break methodology for Maximum STEM Price and between price caps
  - Consequential change to clarify the existing tie-break methodology for the LFAS Market