

MAC Workshop:

**RC_2017_02: Implementation of 30-Minute Balancing
Gate Closure**

18 October 2019

Workshop Purpose

- Provide:
 - A brief overview of the main outcomes from the first workshop; and
 - Updates on happenings since the first workshop.
- Consider the issues that we did not get time to cover in the first workshop:
 - How to quantify the possible effects of the proposal; and
 - Enhancement of information used in trading decisions.
- Consider the next steps in Rule Change Process.

Review of First Workshop Discussions

- System Management considers that:
 - LFAS should be set aside to address uninstructed output fluctuations and not be used to address the aggregate ramp issue.
 - At 60-minute Balancing Gate Closure (**BGC**), the only method available for System Management to address the aggregate ramp issue is to displace the Balancing Portfolio to offset the aggregate ramp.
 - Linear ramping will be required whenever the aggregate ramp exceeds the forecast of Balancing Portfolio's ramp rate.
 - The linear ramping process is not yet defined but will need to be automated.

Review of First Workshop Discussions

- System Management considers that:
 - At 90-minute BGC, System Management can:
 - Displace the Balancing Portfolio to offset the aggregate ramp:
 - Linear ramping can be used if the aggregate ramp exceeds the forecast of the Balancing Portfolio's ramp rate; and
 - Linear ramping can be done manually when required.
 - Dispatch the Balancing Portfolio in advance of the interval, moving coal down in advance of the Trading Interval to bring gas on to offset the aggregate ramp of IPPs.

New System Management Analysis

- System Management has:
 - Developed a formula to determine when Synergy's Balancing Portfolio (minus LFAS Machines) could and could not offset aggregate IPP movement's to meet forecast demand; and
 - Used this formula to analyse when linear dispatch would have occurred in 2018/19:
 - For a 60 minute BGC, this would have occurred for 10% of intervals;
 - For a 90 minute BGC, this would have occurred for 7% of intervals; and
 - The percentages include the frequency of the Balancing Portfolio having to ramp up or ramp down to offset the ramping of IPPs.

Scope of the Rule Change Proposal

- Within scope:
 - LFAS Gate Closure:
 - The LFAS Gate Closure is defined by reference to the BGC – any change to the BGC will necessitate a change to the LFAS Gate Closure.
 - Market Participants' first period submissions for RC_2017_02 indicate that the issue addressed in the Rule Change proposal (accuracy of forecast information) is broader than just in the Balancing Market.
 - This is also consistent with the intent of PRC_14_01.
- Out of scope:
 - Implementation of Linear or Staggered Ramping by the Rule Change Panel:
 - This would require material changes to other functions and go beyond the general issue of accuracy of forecast information.

Benefits and Costs of the Options

BGC	Benefits	Costs
60 minutes	<ul style="list-style-type: none"> • Greater accuracy of information than at 120- and 90-minute BGCs. • Reduced risk. 	<ul style="list-style-type: none"> • Linear ramping (up and down) required in 10% of TIs. • Automatic linear ramping process required. • Long term implementation timeframe and short-term costs (AEMO & Participants), given ETS reforms. • Constrained off (and on?) payments. • Increased use of gas and decreased use of coal, as pre-dispatch is not possible.
90 minutes	<ul style="list-style-type: none"> • Greater accuracy of information than at 120-minute BGCs. • Reduced risk. • Can be implemented without the need for automated linear ramping. 	<ul style="list-style-type: none"> • Linear ramping (up and down) in 7% of TIs; • Manual linear ramping process; • Long term implementation timeframe and short-term costs (AEMO & Participants), given ETS reforms, though less costly for AEMO. • Constrained off (and on?) payments, though less than at 60-minute BGC.
120 minutes (do nothing)		<ul style="list-style-type: none"> • Information available to Market Participants informing trading decisions remains inaccurate; • Increased risk.

Quantifying Effects of Change

Affected parties (AEMO (System Management), Market Participants, ERA, Consumers)?

Estimation

Example: Estimates were employed in quantifying the costs and benefits in the NZ market when they reduced gate closure to 60-minutes. Participants were asked to give examples.

What Questions can be Answered?

- System Operator: (one-off) system implementation costs?
- Market Participants (ongoing): Will one-hour BGC affect behavior, reducing cost of production and by how much? For example, market scenarios:
 - If we displace 150MW of CCGT (SRMC = \$70/MWh) with generation (SRMC = \$30/MWh) for 1 hour five times/year = \$30,000/year.
- ERA Compliance monitoring: Will one-hour BGC increase time and resources needed for monitoring and by how much?

What can't it do?

- Simulate operation of power system to provide an indication of outcomes for the market.
- Predict participant behavior.

Production cost Model – Unit Commitment and Dispatch

Example: Plexos

What does it do?

Simulates operation of power system over a year, for example, at a relatively high resolution (e.g. 30 mins).

What questions can be answered?

- What is least cost dispatch to meet load in TIs?
- What are operation and resource adequacy impacts of the retirement of coal?

Possible outputs

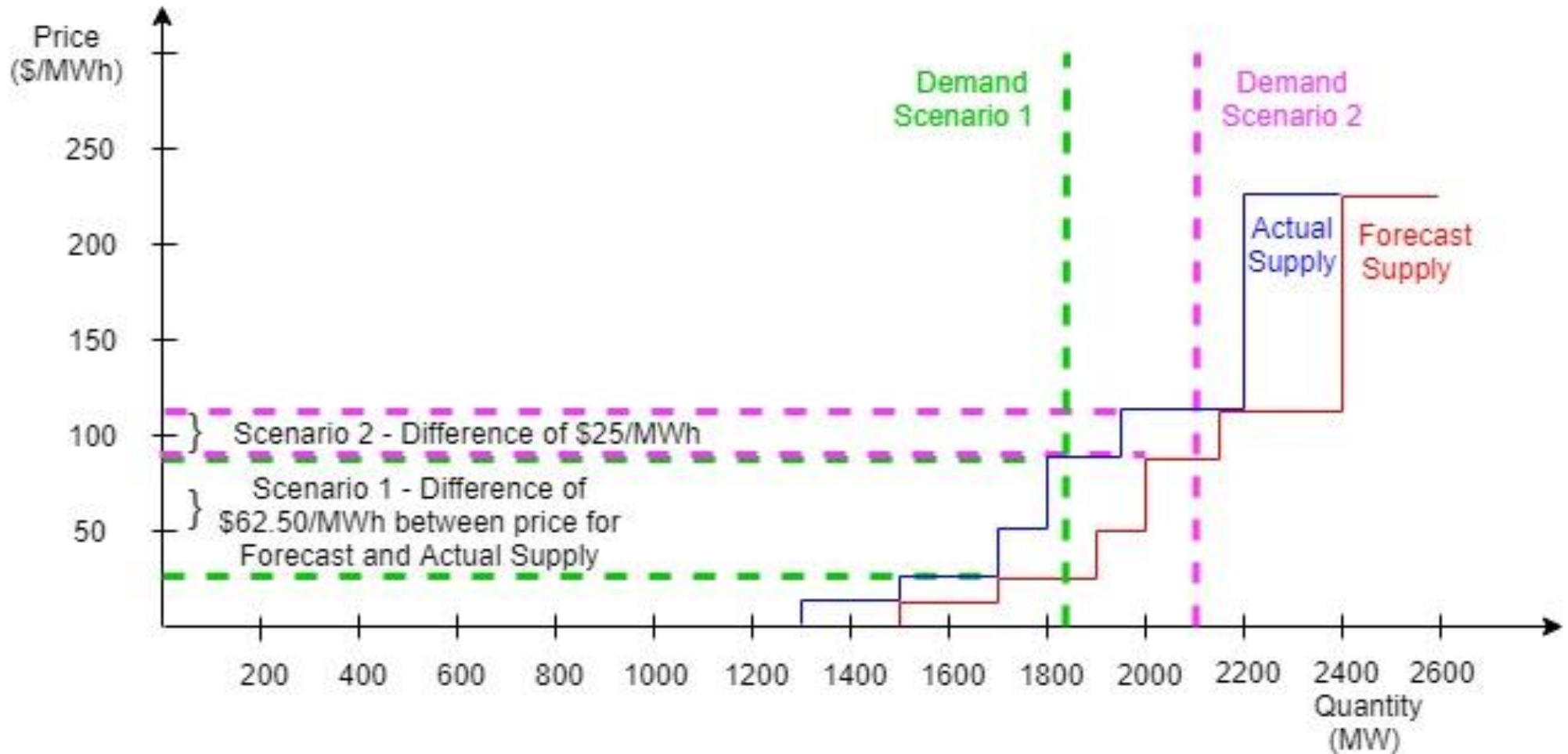
- Unit level generation, marginal prices, ancillary service prices, curtailments.

What can't it do?

- Simulate transmission networks to address specific situations occurring in very short periods (30 seconds to a minute) and assess aspects of reliability – transmission adequacy, generator or transmission contingencies, frequency stability or voltage stability or control.
- Model the portfolio or predict participant behaviour.

In either case, outputs are accurate only to the extent that inputs are accurate (e.g. assumptions about how participants will behave or changes in premiums).

Forecasting Accuracy



In this example there is an over forecast of supply. The effect of demand on price is not linear. It also depends on the mix of available generation.

Intended Approach

- Assessment and identification of preferred options will draw from:
 - stakeholder feedback in first submission period;
 - MAC meetings;
 - the two workshops conducted to date; and
 - One-on-one stakeholder discussions.
- Assessment of proposal against:
 - the Wholesale Market Objectives; and
 - Balancing Market Objectives,
with consideration given to the economic principles underlying these objectives.
- Will not conduct a market simulation using a production cost model.
- Will not attempt to predict participant behaviour and market outcomes.

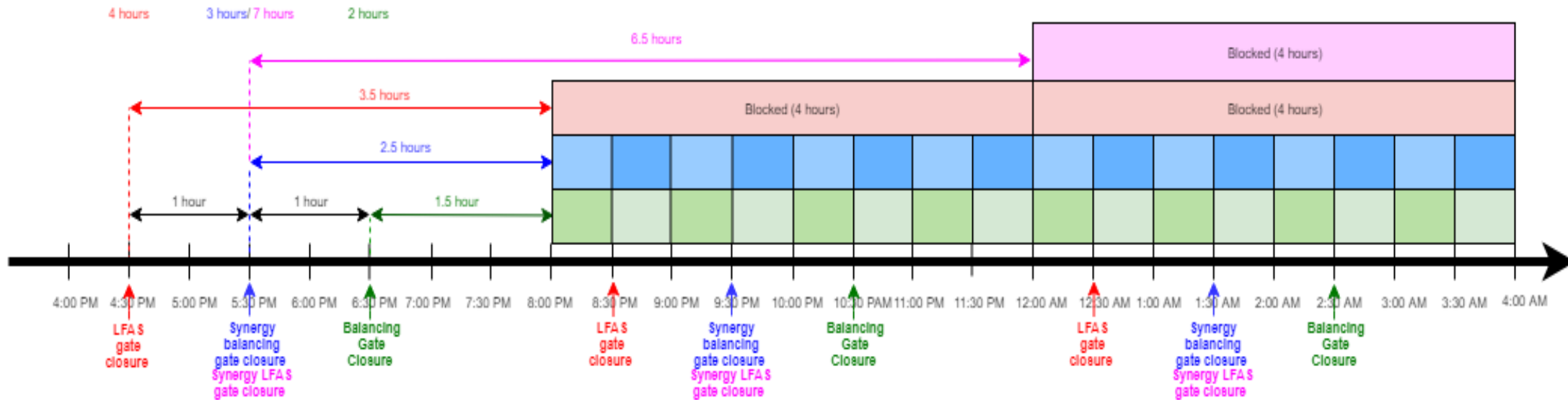
Intended Approach

- Quantitative analyses conducted to support conclusions where possible. For example:
 - Updated analysis showing that forecasting is more accurate closer to real time; and
 - Analysis demonstrating the requirement for pre-dispatch of Synergy's coal plant.
- Consideration and verification of:
 - System Management's analysis of the incidence of the aggregate ramp issue; and
 - The need for linear ramping at a 60-minute BGC.

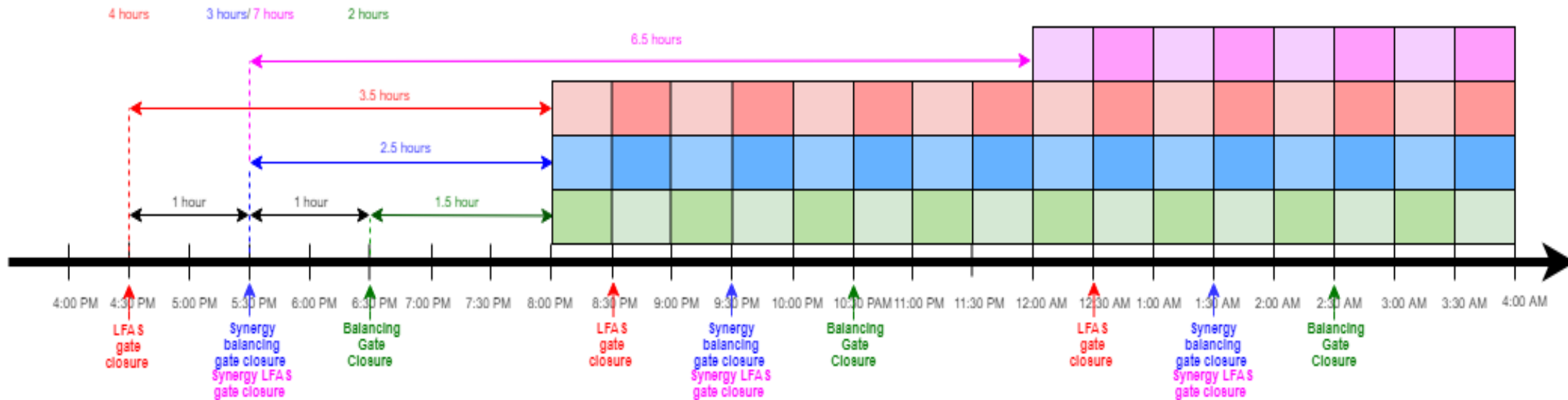
Enhancement of Information used in Trading Decisions

- Alinta's submission – allow, but not require, Market Generators to update their wind forecasts after gate closure.
 - Approved as part of RC_2014_06 on 29 October 2018 and commenced on 1 July 2019.
- Bluewaters submission – require AEMO to publish intermittent generators' actual output information on a timely basis, in real time if possible?
- Is there any other information that would be useful (noting that Consequential Outage information is being considered as part of RC_2014_03)?

Final forecast before gate closure



Final forecast before gate closure



Next Steps

- Follow up with AEMO on requested Data and determine:
 - Accuracy of forecasts closer to real time;
 - Frequency of aggregate ramp issue; and
 - Need for linear ramping.
- Follow up on views expressed in workshops and continue to consult using one-on-one discussions, where required; and
- Develop a Draft Rule Change Report for the Rule Change Panel's consideration.

Questions?