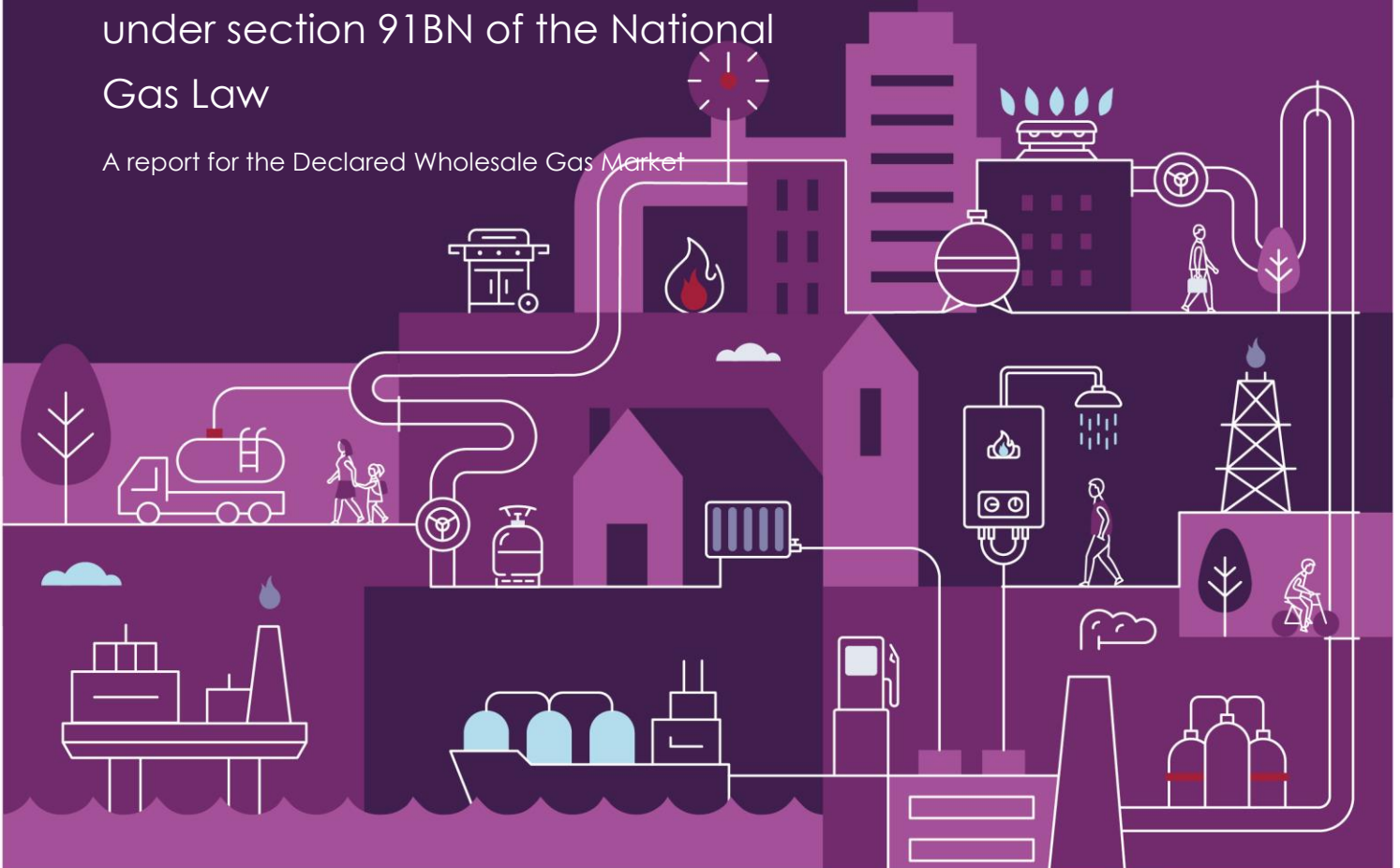


Investigation into an unintended scheduling result – 17 June 2025

August 2025

Assessment report on DWGM 10PM scheduling outcomes for gas day 17 June 2025, including evaluation of potential breaches of the Wholesale Market Procedures under section 91BN of the National Gas Law

A report for the Declared Wholesale Gas Market





We acknowledge the Traditional Custodians of the land, seas and waters across Australia. We honour the wisdom of Aboriginal and Torres Strait Islander Elders past and present and embrace future generations.

We acknowledge that, wherever we work, we do so on Aboriginal and Torres Strait Islander lands. We pay respect to the world's oldest continuing culture and First Nations peoples' deep and continuing connection to Country; and hope that our work can benefit both people and Country.

'Journey of unity: AEMO's Reconciliation Path' by Lani Balzan

AEMO Group is proud to have launched its first [Reconciliation Action Plan](#) in May 2024. 'Journey of unity: AEMO's Reconciliation Path' was created by Wiradjuri artist Lani Balzan to visually narrate our ongoing journey towards reconciliation - a collaborative endeavour that honours First Nations cultures, fosters mutual understanding, and paves the way for a brighter, more inclusive future.

Important notice

Purpose

AEMO has prepared this report in accordance with rule 218 of the National Gas Rules (NGR), using information available as at 14 August 2025, unless otherwise specified.

Disclaimer

AEMO has made reasonable efforts to ensure the quality of the information in this report but cannot guarantee its accuracy or completeness. Any views expressed in this report are those of AEMO unless otherwise stated, and may be based on information given to AEMO by other persons. Accordingly, to the maximum extent permitted by law, AEMO and its officers, employees and consultants involved in the preparation of this report:

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1 Introduction

AEMO has now identified the unintended scheduling result in the Declared Wholesale Gas Market (DWGM) which occurred during the 10PM scheduling horizon on 17 June 2025 and this report makes that determination final. The issue stemmed from incorrect constraints applied at the Culcairn, Iona, and VicHub injection and withdrawal points while resolving inconsistent bid alarms generated by the Market Clearing Engine (MCE). As a result:

- a quantity of gas under an injection bid below the market price was not scheduled for injection; and
- a quantity of gas under a withdrawal bid above the market price was not schedule for withdrawal.

AEMO initiated an investigation under rule 218(1)(b) of the National Gas Rules (NGR) to determine whether this constituted an unintended scheduling result. This report aims to:

- assess the nature and impact of the scheduling error; and
- in accordance with rule 218(3) of the NGR, provide DWGM Market Participants with a decision on whether an unintended scheduling result has occurred at the 10PM schedule for 17 June 2025 and sufficient details to enable Market Participants to identify the relevant operating schedule and the matter investigated by AEMO.

Market Participants can find the official notice of investigation on AEMO's website¹.

In addition, AEMO has determined that the scheduling outcome did not comply with the Gas Scheduling Procedures. AEMO is required to report the breach of the Wholesale Market Procedures, which includes the Gas Scheduling Procedures, under s 91BN of the National Gas Law (NGL).

2 Event details

AEMO's key input into the scheduling process includes AEMO's demand forecasts and demand forecast overrides (when required), end of gas day linepack target, constraints, intraday adjustments for injection or controllable withdrawals and other relevant input data.

There are four types of constraints that are used in the DWGM to reflect facility or transmission system limitations. These are:

- A Supply Demand Point Constraint (SDPC) which applies minimum or maximum (hourly or daily) values to an individual injection or withdrawal meter to reflect the limitations of the physical connection point; OR in the case of total system congestion to 'force in' a quantity of gas for avoiding a Threat To System Security (TTSS).
- A Directional Flow Point Constraint (DFPC) which applies to limit the maximum *net* injections or withdrawals for a pair of one injection and one withdrawal meter for the same external facility, reflecting the net physical flow capacity of that facility.

¹ <https://www.aemo.com.au/energy-systems/gas/declared-wholesale-gas-market-dwgm/dwgm-events-and-reports>

- A Net Flow Transportation Constraint (NFTC) which is similar to the DFPC but may be applied to one or more pair of bi-directional meters to reflect the physical flow limitation within the pipeline network itself.
- A Zonal Flow Transportation Constraint (ZFTC) which is similar to NFTC but may be applied to two or more pipeline system to reflect the physical flow limitation within those pipeline systems.

On gas day 17 June, there were five constraints applied to limit daily or hourly quantities, with three of the constraints being standing constraints.

- There are currently three standing DFPCs at VicHub, TasHub and SEA Gas which constrains their net withdrawals to 0 GJ/h, to reflect physical limitations at those meters.
- A NFTC was applied to the operating schedule (OS) at the Iona close proximity point (CPP) from the 6AM schedule to limit net injections in line with the transmissions system capacity as outlined in the Victorian Gas Planning Report.
- A DFPC for Culcairn to limit withdrawals was requested by the facility operator from 10PM and was applied by the AEMO.

When the 10PM schedule was run, the MCE produced schedules with Inconsistent Schedule Bid Alarms for quantities associated with Culcairn (PS and OS), VicHub (PS and OS), TasHub (PS only) and Iona (OS only), which indicated that out-of-merit-order gas bids had been incorrectly scheduled at those locations. The constraints, while achieving the intended outcomes to limit net flows to the required quantities at each location, had scheduled quantities in a way that was inconsistent with market price. This is an existing issue that can occur when the schedule is subject to multiple constraints.

An explanation of the issue is outlined in the section below. In this case, AEMO attempted to resolve the out-of-merit-order bids at four different meter locations manually, using SDPCs to correct the outcomes determined by the DFPCs within the 60-minute scheduling window. However, due to the number of constraints and the difficulty experienced in resolving them, AEMO made the decision to approve what it believed to be a valid paired schedule that did not include Out Of Merit Order (OOMO) gas bids rather than reapprove the 6PM schedule and administer the market. This however led to incorrect quantities being scheduled at VicHub, Culcairn and TasHub.

Inconsistent bid outcomes in scheduling

When constraints like Directional Flow Point Constraints (DFPCs) or Net Flow Transportation Constraints (NFTCs) are applied, the Market Clearing Engine (MCE) may attempt to meet the constraint by scheduling gas in the opposite direction of the constraint rather than reducing flow in the constrained direction.

This can result in:

- Injections scheduled above market price (i.e. more expensive gas being injected)
- Withdrawals scheduled below market price (i.e. cheaper gas being withdrawn)

Both outcomes violate the merit order principle of the DWGM, which requires that:

- Lower-priced injection bids be scheduled first
- Higher-priced withdrawal bids be scheduled last

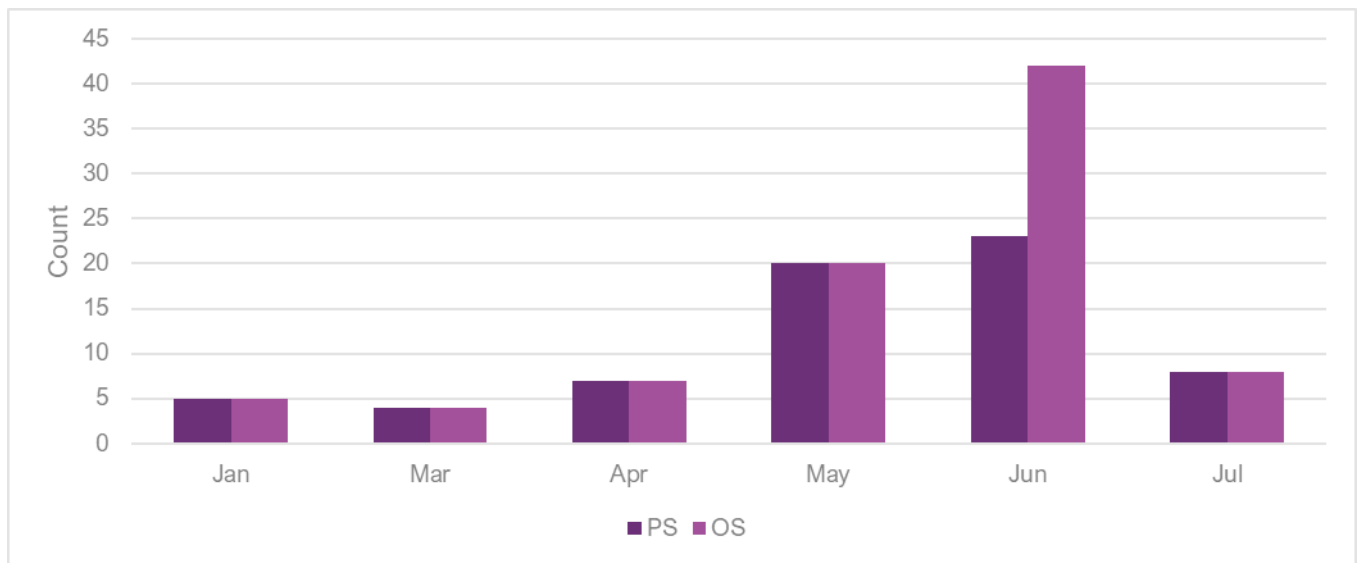
The MCE is designed to generate Inconsistent Schedule Bid alarms, which indicate to the scheduler that OOMO injections or withdrawals have occurred at a particular meter location. This alarm then prompts AEMO to resolve

the error, which involves the application of additional SDPC constraints to override the flawed outcomes of the DFPCs and NFTCs.

The inconsistent bid alarms are typically the same in both the PS and OS. In very rare occasions, the inconsistent bid alarm would occur in the OS but not the PS or vice versa. In June 2025, the number of inconsistent bid alarms was higher in the OS than in the PS, attributable to the application of OS-only NFTCs during that period.

Figure 1 summarises the monthly total of current day scheduling intervals with OOMO bids that AEMO has been required to resolve since 1 January 2025, highlighting the frequency and complexity of these scheduling anomalies during May and June 2025.

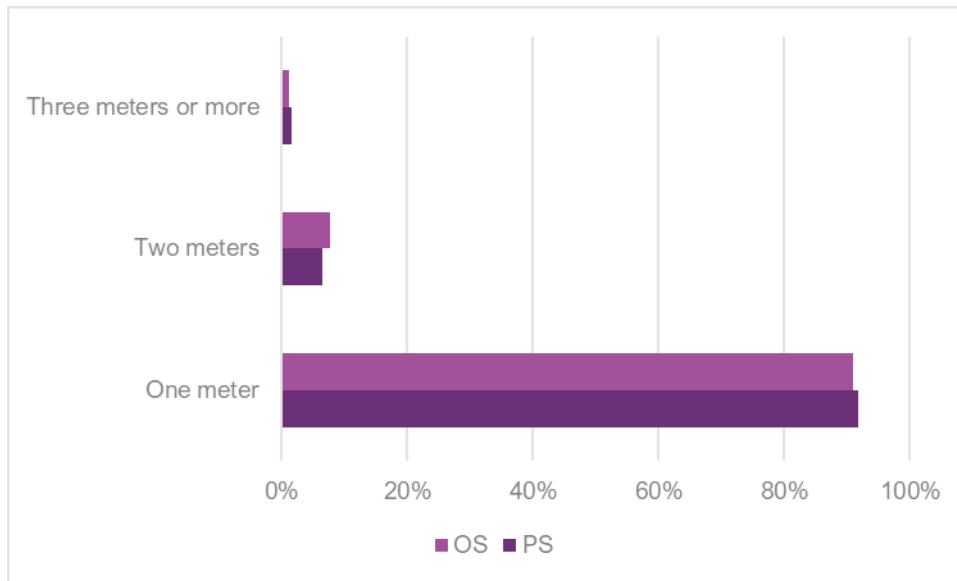
Figure 1 Total monthly inconsistent bid alarms for PS and OS



AEMO is occasionally required to resolve OOMO bids at a single meter location and typically, the same solution would be applied to both the PS and OS. Although very rare, AEMO would also be required to resolve OOMO bids at two-meter locations but with the same solution being applied to both the PS and OS.

Figure 2 below shows since 1 January 2025, 90% of the time, the OOMO bids only occur at one meter location in both the OS and the PS. Around 7%-8% of the time, the OOMO bids occur at two-meter location and the only time it has occurred in more than two-meter location was on the 17 June 2025.

Figure 2 Percentage occurrence for number of meters



When the MCE generates an Inconsistent Schedule Bid alarm, AEMO follows a structured approach to correct the schedule:

1. **Apply Additional SDPCs**
AEMO introduces Supply Demand Point Constraints (SDPCs) to override the flawed outcomes caused by DFPCs or NFTCs. These constraints are targeted at specific meter locations where OOMO bids occurred.
2. **Re-run the Schedule**
AEMO re-runs the DWGM schedule to test whether the SDPCs have successfully eliminated the OOMO bids.
3. **Multiple Iterations if Needed**
If alarms persist, AEMO may need to run several iterations of the schedule, adjusting SDPCs each time until the alarms are cleared.
4. **Remove Temporary SDPCs**
Once the schedule is free of OOMO bids, AEMO removes the additional SDPCs before final approval. This ensures that these temporary constraints do not affect subsequent schedules for the rest of the gas day.

3 Market impacts

The 10PM price market price was slightly impacted due the incorrect quantities being obtained. The published market price for the 10PM pricing schedule was \$11.5000/GJ. In a schedule run after the event in AEMO’s testing environment to obtain the ideal outcome, the market price for 10PM pricing schedule increased to \$11.7149/GJ.

Whilst more gas could have been scheduled at Culcairn and VicHub injection and withdrawal points, the net quantity for those two points remained the same in the published and expected schedule. More gas was expected to be scheduled at TasHub and Iona.

There was no material impact on the operation of the Declared Transmission System (DTS) as the net scheduled quantity of gas for the system was correct.

A comparison between the published and the expected schedule outcomes are shown in Table 1.

Table 1: Comparison between published and expected schedule outcome for 10PM 17 June 2025.

		Culcairn (GJ)	VicHub (GJ)	TasHub (GJ)	Iona (GJ)
Published	Injection	17,001	60,486	52,122	391,675
	Withdrawal	36,604	9,294	2,625	787
	Net	-19,603	51,192	49,497	390,888
Expected	Injection	19,001	74,995	56,264	391,675
	Withdrawal	38,604	23,803	0	311
	Net	-19,603	51,192	56,264	391,364

Estimated financial impact

The error resulted in the combined changes to imbalances, deviation and linepack payments for 6 participants² being less than they would have been had the error not occurred.

Based on the comparison between published and expected outcomes for the 10PM schedule, AEMO has estimated the financial effect of the misapplication of constraints on Market Participants for the 10PM operating schedule and notes that the biggest estimated financial impact on a single Market Participant was \$56,697.22³.

The financial effect of this event exceeds the thresholds set out in NGR 217(4)(a) and NGR 217(4)(b).

Market Participants who may have been negatively impacted by the unintended scheduling result will be notified by AEMO.

4 Assessment of the event

As indicated in Table 2, AEMO has determined that the scheduling outcome did not comply with the Gas Scheduling Procedures and meets the financial thresholds criteria for unintended scheduling results. AEMO is required to report the breach of the Wholesale Market Procedures, which includes the Gas Scheduling Procedures, under s 91BN of the NGL.

² AEMO is only considering participants with financial impacts over \$100 threshold.

³ Note that the financial effects calculated for the purposes of this report are only an estimate of Market Participants' change in financial position within the market.



Table 2: Assessment of the event under section 91BN of the National Gas Law

Assessment Criteria	Assessment
<p>Gas Scheduling Procedures within Wholesale Market Operation Procedures (Victoria)</p> <p>Section 7.4.3 Scheduling Objectives</p> <p>AEMO will, to the extent practicable, attempt to satisfy the following objectives when issuing scheduling instructions:</p> <p>...</p> <p>(c) minimise the cost of satisfying demand for gas, taking into account:</p> <p>...</p> <p>(ii) injection bids and withdrawals bids by Market Participants</p> <p>...</p>	<p>AEMO approved the 10PM pricing and operating schedules that incorrectly limited injections and withdrawals at multiple injection and/or withdrawal meters. This was caused by errors in calculating OOMO gas bids while resolving inconsistent bid alarms.</p>
<p>Gas Scheduling Procedures within Wholesale Market Operation Procedures (Victoria)</p> <p>Section 7.10.4 Directional Flow Point Constraints</p> <p>A special case of the SDPC, a Demand Flow Point Constraint (DFPC), allows an injection and withdrawal meter to be paired so that the net flow is subject to a new set of constraints. The feature of the MCE is also capable of specifying different maximum flow limits depending on the net direction of flow.</p> <p>Maximum hourly and maximum daily constraints can be specified in either or both flow directions and are applied on both the operating schedule and the pricing schedule.</p> <p>This feature of MCE allows for financial flows to be maximised in either or both directions subject to physical limits specified in either</p>	<p>DFPCs were correctly specified in scheduling systems, however the MCE produced schedules that included inconsistent bids at Culcairn, VicHub and TasHub. It contributed to incorrect quantities being scheduled.</p>

Assessment Criteria	Assessment
<p>operating agreements or operational conditions on the day.</p> <p>...</p>	
<p>Gas Scheduling Procedures within Wholesale Market Operation Procedures (Victoria)</p> <p>Section 7.19 Gas Scheduling in Abnormal Conditions</p>	<p>Abnormal conditions 2 and 3 cover what actions AEMO may take when it is unable to produce pricing and/or operating schedules. In this case, at the time of approval, AEMO was of the view that the pricing schedule was valid (having removed out of merit order quantities) and the operating schedule was feasible, therefore the abnormal conditions did not apply.</p> <p>The procedures define a <i>Valid Pricing Schedule</i> as:</p> <p><i>A pricing schedule that achieves competitive market price outcomes by scheduling the lowest-priced injection bids, the highest-priced withdrawal bids and demand forecasts, within the accreditation of controllable quantities and the capacity limitations at connection points.</i></p> <p>Having reviewed the event, AEMO is of the view that the scheduling outcomes were largely valid in their outcomes, despite quantities not being scheduled to their full extent. Capacity limitations were correctly reflected and scheduled bids were scheduled in price-merit-order.</p>
<p>(a) NGL s91BN(2) If AEMO suspects a breach of the Wholesale Market Procedures, it must make a decision as to whether the breach is a material breach.</p>	<p>AEMO has determined that the breach is material because while it did not cause significant system and operational impacts to market participants, AEMO, end users and stakeholders, it did cause significant financial impacts to market participants as defined by the unintended scheduling result threshold.</p>

4.1 Determination of unintended scheduling result

AEMO has assessed these events against the criteria in rule 217 of the NGR in Table 3. In its assessment of the event AEMO has considered the outcome is an unintended scheduling result.

Table 3 Determination of unintended scheduling result

Assessment Criteria	Assessment
<p>NGR 217(1) If scheduling instructions issued as part of an operating schedule produce one or more of the following results:</p> <p>...</p> <p>(c) a quantity of gas under an injection bid below the market price is not scheduled for injection;</p> <p>(d) a quantity of gas under a withdrawal bid above the market price is not scheduled for withdrawal;</p> <p>...</p> <p>then that result will be an unintended scheduling result unless otherwise specified in subrules (2), (3), (4).</p>	<p>For the 10PM schedule on gas day 17 June 2025, there were quantities of gas at Culcairn, VicHub and TasHub injection point bid below the market price that were not scheduled for injection due to the impact of the misapplied constraint.</p> <p>There were also quantities of gas at Culcairn and VicHub withdrawal point bid above the market price that were not scheduled for withdrawal due to the impact of the misapplied constraint.</p>
<p>NGR 217(4) A result specified in subrule (1) will not be an unintended scheduling result unless its estimated financial effect on Market Participants exceeds either:</p> <p>(a) for an individual Market Participant, \$20,000, adjusted to reflect the change in the Consumer Price Index in accordance with subrule (5); or</p> <p>(b) for all affected Market Participants, an aggregate of \$50,000, adjusted to reflect the change in the Consumer Price Index in accordance with subrule (5)</p>	<p>The maximum estimated financial impact on a single Market Participant was \$56,697.22⁴.</p> <p>Because the estimated financial effect on this event exceeds the threshold set out in rule 217(4)(a), this event meets the criteria for an unintended scheduling result.</p>

5 Further actions

Whilst AEMO recently upgraded the MCE in December 2024, the MCE upgrade was required to address new software standards and IT system requirements had changed over time. The MCE upgrade ensured that the Operating Schedule now utilises the same economic solver used to generate the current Pricing Schedule. The MCE upgrade would enable the software to be more easily supported and position AEMO to continue to make alterations as the Victorian Declared Transmission System changes and the needs of the DWGM evolve during the energy transition.

⁴ Note that the financial effects calculated for the purposes of this report are only an estimate of Market Participants' change in financial position within the market.

Following the upgrade, and after this event, AEMO has begun investigating enhancements to the MCE solver to enable the solver to identify and report the bid quantity scheduled OOMO for the rest of the hours within the Inconsistent Bid Alarms description. Once OOMO gas bid quantities are identified, include a second iteration where those OOMO quantities scheduled will be subtracted from the inputs, and a new optimised schedule will be provided while meeting the conditions of DFPC, NFTC and/or ZFTC.

These improvements aim to reduce manual intervention, improve scheduling accuracy, and prevent unintended outcomes like those seen on 17 June 2025.