

DA Reserve Product and Post DA Commitments

Reserve Certainty
Senior Task Force
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Monitoring Analytics

DA Uncertainty

- **PJM is proposing a DA only reserve product to address DA uncertainty.**
- **These reserves do not have to be maintained in real time. Uncertainty decreases as we approach real time. PJM has acknowledged that.**
- **PJM argues that the RAC process is used today to ensure sufficient physical supply is available for the next operating day to meet the load forecast plus operating reserves.**
 - **These needs are not reflected in the DAM.**
- **PJM argues that procuring these needs via RAC is no longer sufficient, given the increased dependence on resources that need to make fuel arrangements day ahead.**

DA Uncertainty

- **PJM defined problems:**
 - **Addressing DA uncertainty through RAC commitments is no longer sufficient.**
 - **DA uncertainty is not reflected in DA prices.**
- **There are pros and cons of both PJM's proposal and status quo.**
- **The IMM does not believe status quo is a problem.**
- **The IMM does not believe PJM's proposal is better than status quo.**

**PJM DEFINED PROBLEM: ADDRESSING DA
UNCERTAINTY THROUGH RAC COMMITMENTS IS
NO LONGER SUFFICIENT.**



DA vs RAC Issue

- **PJM has the authority to make commitments at any time. This was evident in the advance commitments made during Polar Vortex 2025.**
- **Having the DAM procure more reserves is no more reliable than status quo.**
- **Waiting for the DAM to add commitments could make things worse compared to advance commitments prior to DAM.**

Unit Scheduling

- **Scheduling by PJM includes the Day-ahead Energy Market, the RAC run process and the Real-time Energy Market.**
 - **The Day-ahead Energy Market bid/offer period closes at 11:00 on the day before the Operating Day and the Day-ahead Market results are posted by 13:30 or as soon as practicable thereafter.**
 - **The RAC run process occurs throughout the day before the Operating Day.**
 - **The Real-time Energy Market performs unit commitment and dispatch during the Operating Day.**

RAC Timeline

- **After Day-ahead Results posted until 14:15 — PJM opens the Real-time Energy Market offer period. During this time, market participants can submit revised resource offers.**
- **14:15 – The Real-time Energy Market offer period closed. PJM performs a second resource commitment known as the Reliability Assessment and Commitment (RAC) Run, which includes the updated offers, updated resource availability information and updated PJM load forecast information and load forecast deviation. The focus of this commitment is reliability and the objective is to minimize startup and no load costs for any additional resources that are committed.**

RAC Process

- **During the RAC Run, PJM schedules additional resources as needed to satisfy the PJM Load Forecast and the Operating Reserve objective based on minimizing the scheduling cost.**
- **PJM also schedules additional resources outside of the DAM for reliability reasons, including:**
 - **Constraints and/or contingencies not modeled in the DAM (e.g. reactive / voltage).**
 - **Conservative operations.**

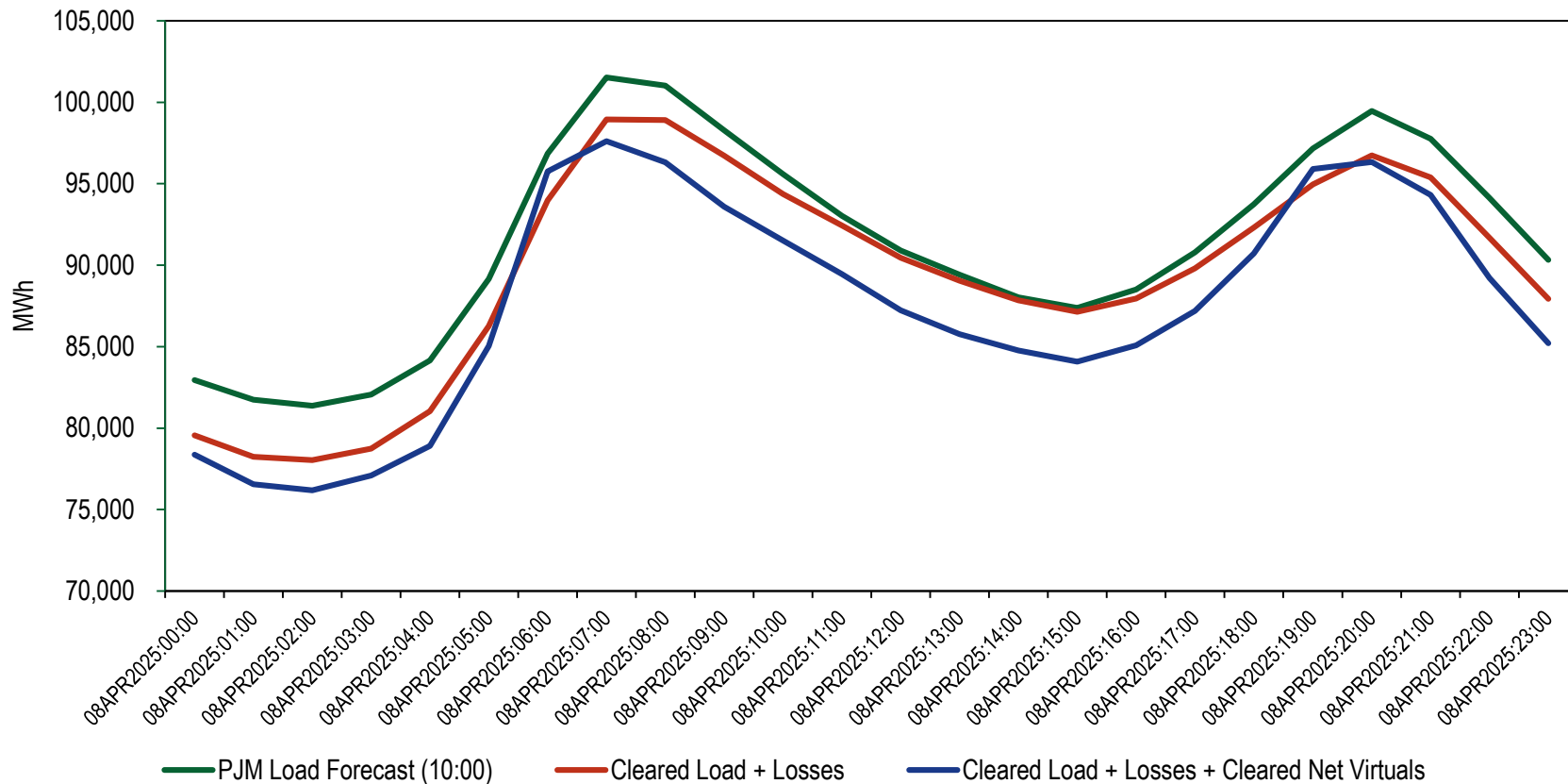
Post DA Examples

- **April 8 and 9, and June 26 were days with high post DA commitments.**
 - **April 9 and June 26 results are included in the appendix.**
 - **The IMM is reviewing these commitments to:**
 - Remove any advanced commitments (i.e. pre DA) that may appear as post DA in the data.
 - Separate commitments from RAC versus others.
- **The next slides show the market conditions, and details of April 8.**

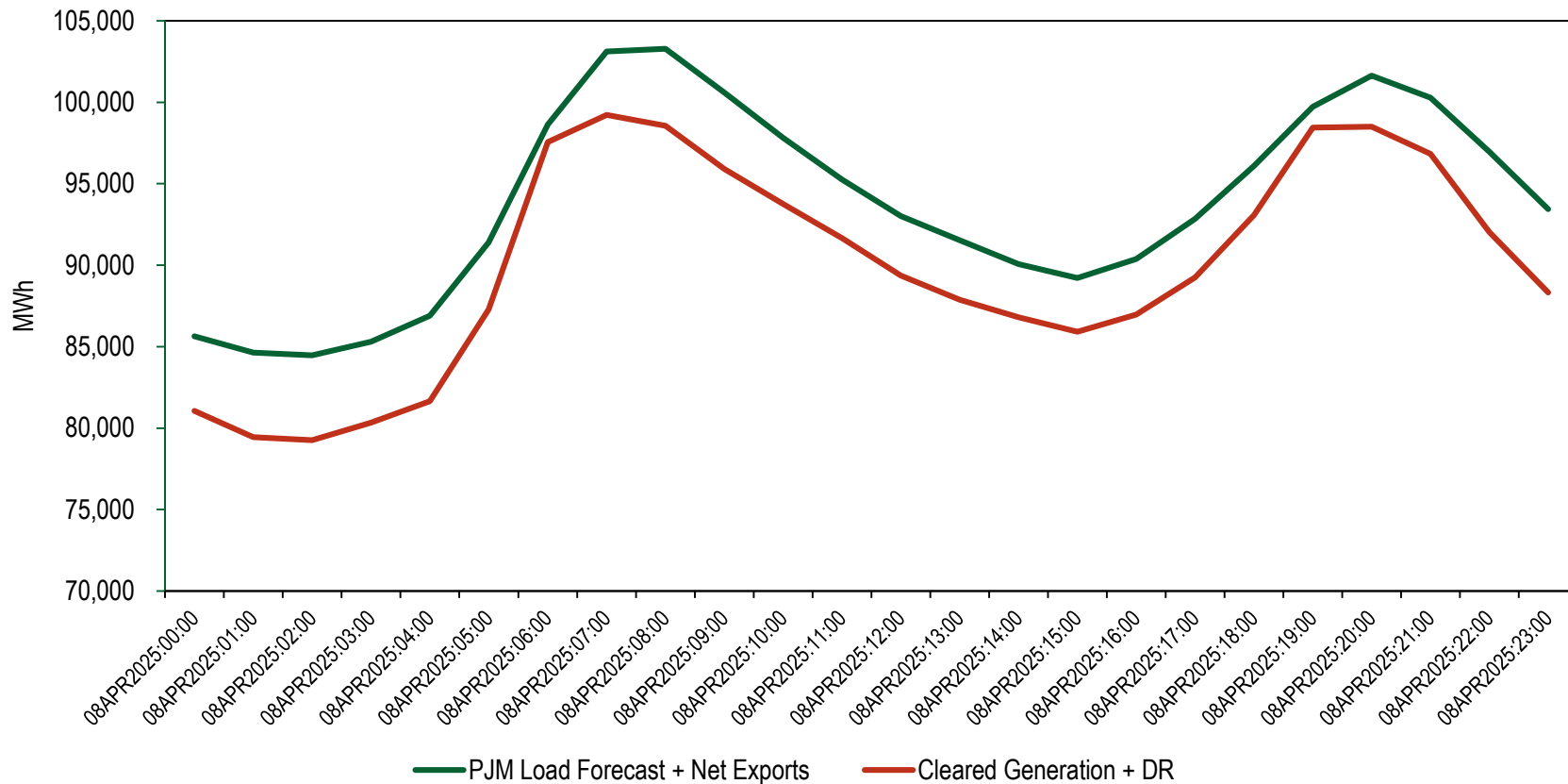
April 8, 2025 Post DA Commitments

- **Seven units committed after the DA market.**
 - **All for conservative operations.**

April 8 DA Market Results



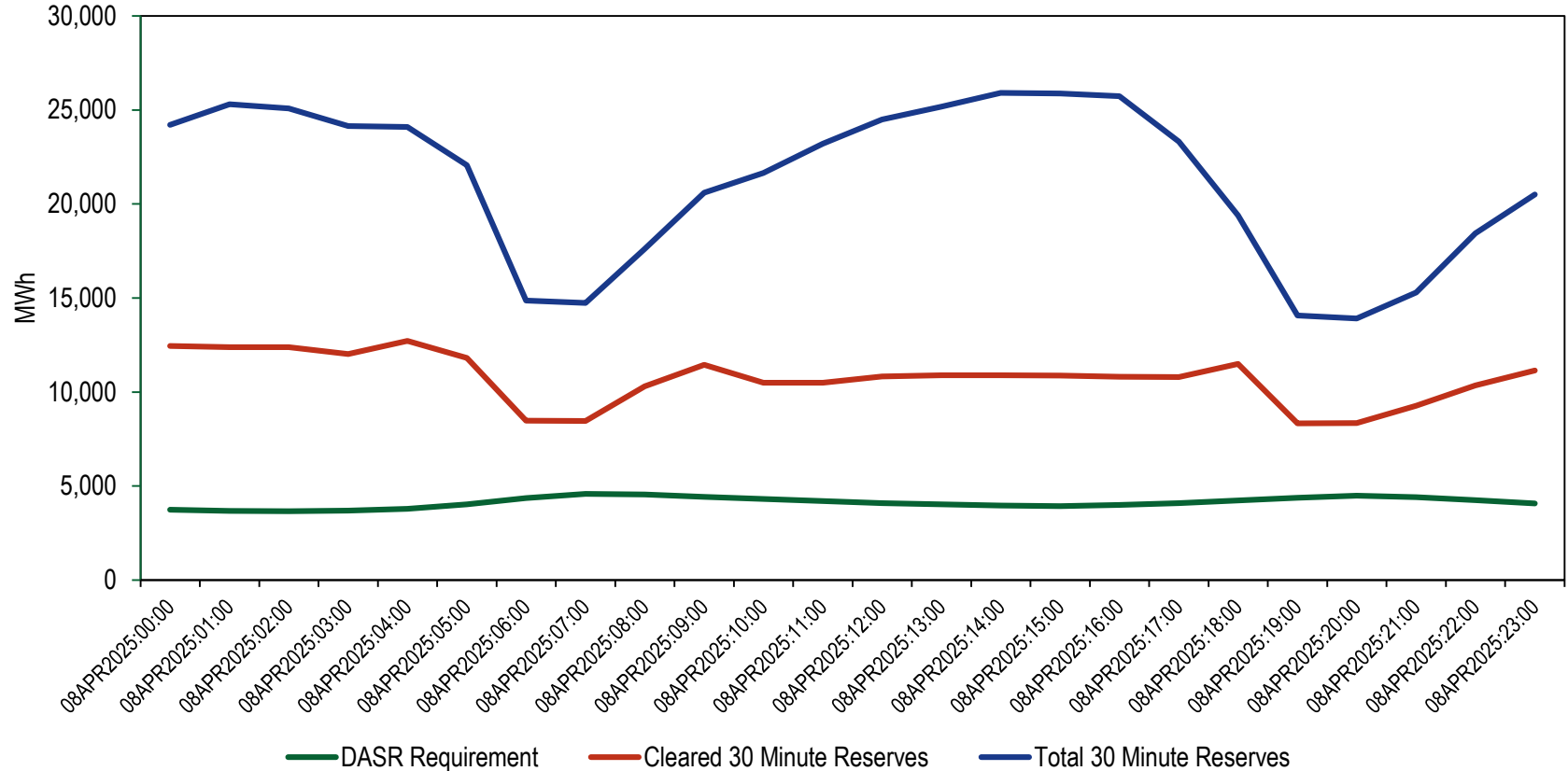
April 8 DA Market Results



April 8 DA Market Results

- **Forecasted Peak Hour: 7:00**
 - **PJM Load Forecast: 101,526 MWh**
 - **Cleared Bid Load + Losses: 98,950 MWh (2,576 MWh below forecast).**
 - **Cleared Bid Load + Losses + Cleared Net Virtuals: 97,618 MWh (3,908 MWh below forecast).**
- **Supply versus demand**
 - **PJM Load Forecast + Cleared Net Exports: 103,126 MWh**
 - **Cleared Generation + Econ DR: 99,218 MWh (3,908 MWh below forecast + net exports).**

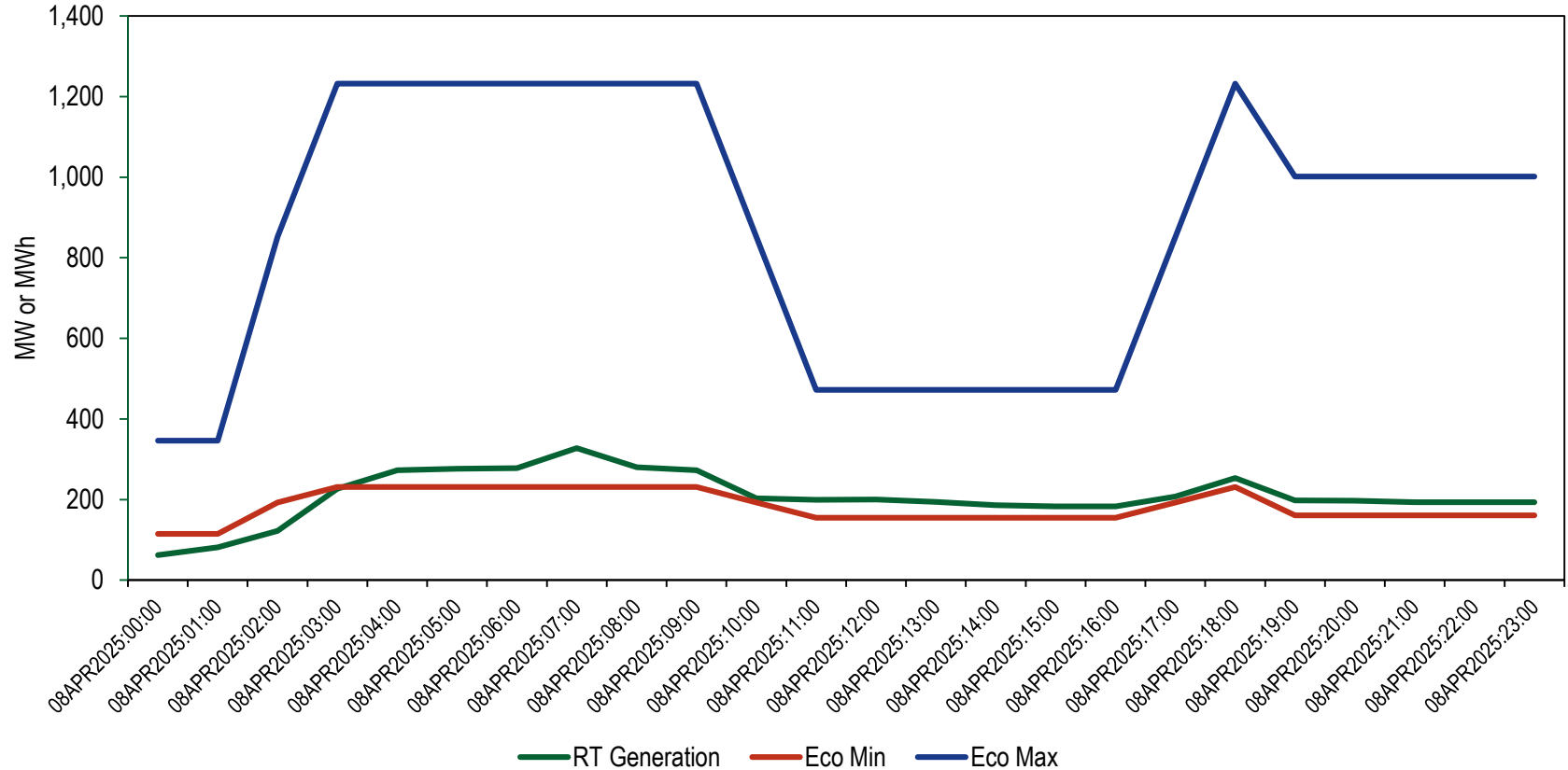
DA Thirty Minute Reserves



DA 30 Minute Reserves

- **The difference between cleared reserves and total reserves is that when there are enough reserves to meet the 30 minute reserve requirement, PJM does not clear all available reserves. A tie breaker is applied.**
- **Total reserves is the total 30 minute reserve capability regardless of clearing.**

Post DA MW



Post DA Commitment Results

- **All units received uplift.**
- **Units operated at minimum output.**
- **Total uplift was \$331,358.**
 - **All paid by RT Load + RT Exports**
- **Average offer: \$160/MWh**
- **Average LMP: \$88/MWh**



Observations

- The market had reserves to cover operating reserves requirement (DASR requirement) plus the PJM load forecast and net exports.
- Uplift paid to the units committed for “economics” is allocated to deviations.
 - This includes load that did not participate in the DAM.
 - This includes generation that operated in real time that did not offer DA (e.g. energy only intermittent).
 - This includes INCs and DEC.
 - This includes deviations from interchange transactions.
- Uplift paid to units committed for reliability is allocated to RT Load + RT Exports.

Fuel Arrangements

- Another argument is the dependence on resources that need to make fuel arrangements day ahead.
- This is about natural gas.
- Gas needs to be nominated in advanced.

	Timely	Evening	ID1	ID2	ID3
Nom Deadline	14:00	19:00	11:00	15:30	20:00
Confirmation Deadline	17:30	21:30	13:30	18:00	22:30
Scheduled Volumes Available	18:00	22:00	14:00	18:30	23:00
Start of Gas Flow	10:00	10:00	15:00	19:00	23:00

- Pipelines allow retroactive nominations but not during critical periods.

Fuel Arrangements

- **PJM wants to setup a market mechanism in which gas units clear reserves and purchase gas that they may or may not use.**
- **It will be more likely than not that these units will end up leaving the gas in the pipelines or disposing of it. That is because reserves are procured for eventualities that do not occur often.**
- **This means that gas units will be using pipelines as storage.**
- **Pipeline offer storage services but these services are fixed costs, not variable.**

Fuel Arrangements

- Due to the timing of the DAM, gas units will know about their reserve assignment by 13:30, at the earliest. This gives gas units 30 minutes to purchase and nominate gas by the timely nom.
- During Polar Vortex 2025, some units bought gas when notified of the commitment by PJM, others bought gas later, after the timely nom, others bought gas intraday. Some bought gas for the entire capability of the resource (Eco Max), some bought gas for operating at min load (Eco Min).

Fuel Arrangements

- **Introducing a reserve product that requires gas units to purchase gas in advance will result in overprocurement of gas by design.**
- **It is questionable whether this approach of purchasing excess gas will be sustainable and acceptable to the pipelines.**

PJM DEFINED PROBLEM: DA UNCERTAINTY IS NOT REFLECTED IN DA PRICES.



Prices

- **The objective of a DA only reserve product is to raise DA prices by reflecting DA uncertainty in the DAM.**
- **Is this better than status quo?**
- **Possible outcomes:**
 - **If new requirement does not change commitment. Additional costs incurred for no benefit and units will still be committed via RAC.**
 - **If new requirement changes commitment. Actions and prices are aligned.**

Prices

- In both cases, the new requirement will introduce another divergence between DA and RT.
 - Keeping everything else equal, DA prices will tend to exceed RT prices since DA will have a constraint not needed in RT.
 - This provides an incentive to reduce load participation in the DAM.

IMM Position

- **The IMM has acknowledged that PJM needs to manage uncertainty on both supply and demand sides.**
- **The IMM believes PJM has the tools to manage this uncertainty, although the market could benefit from more transparency regarding how the decisions are made.**
- **The IMM does not believe that creating a new product is better than status quo or necessary, because a new product can lead to increased costs without any tangible benefits.**

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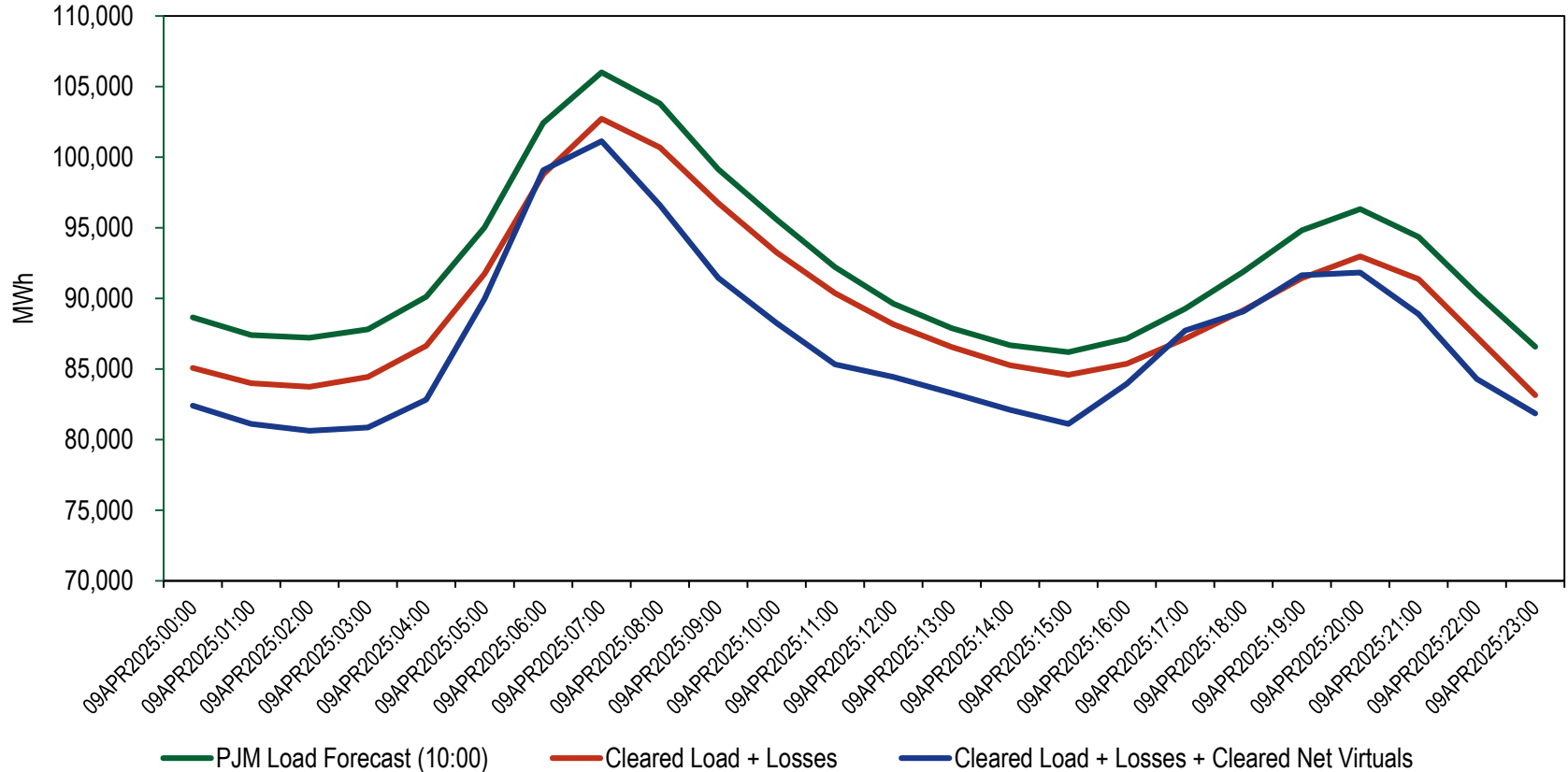


April 9, 2025 Post DA Commitments

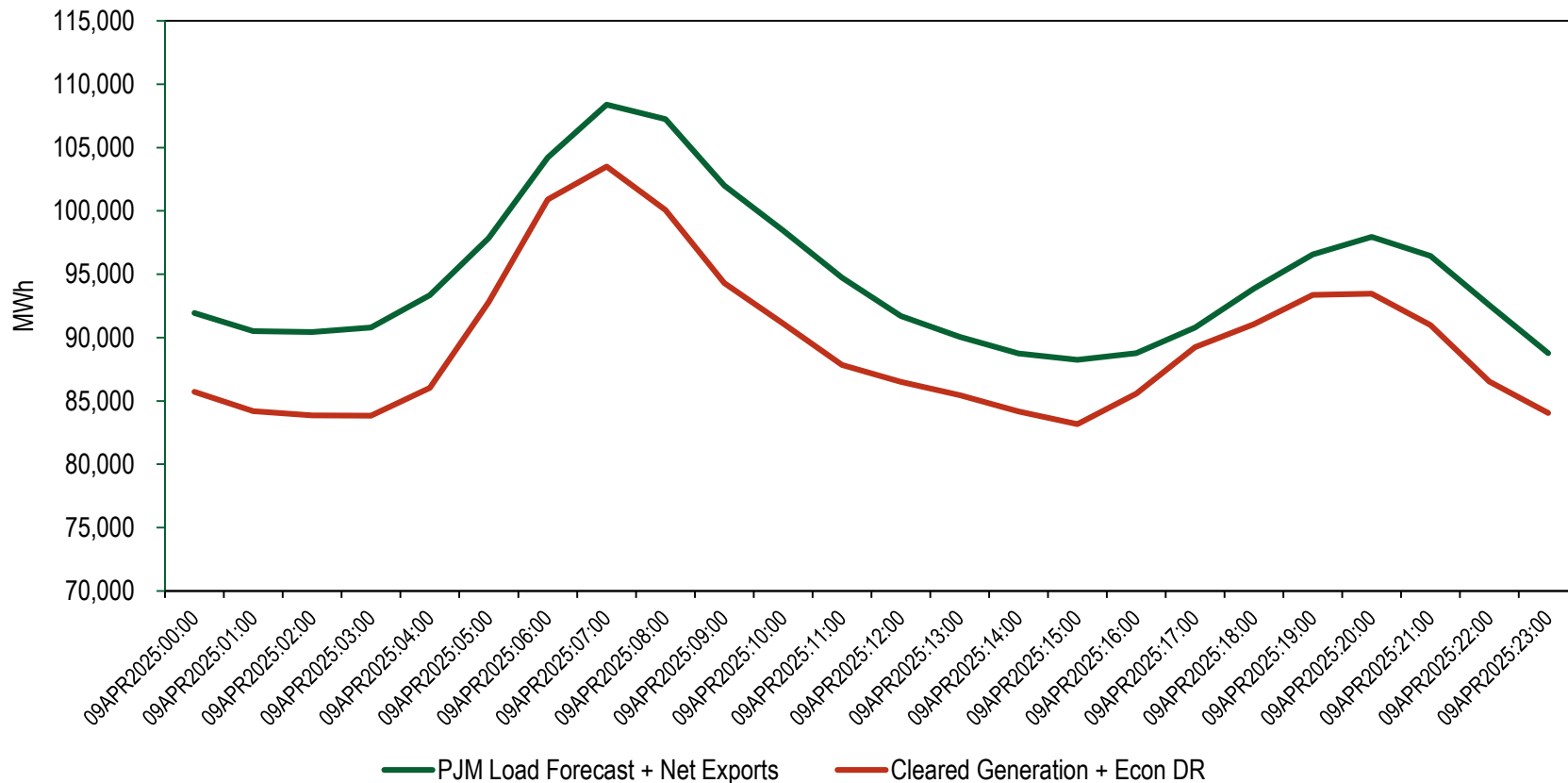
- **Ten units committed after the DA market.**
 - **Four for conservative operations.**
 - **Seven for economics.**



April 9 DA Market Results



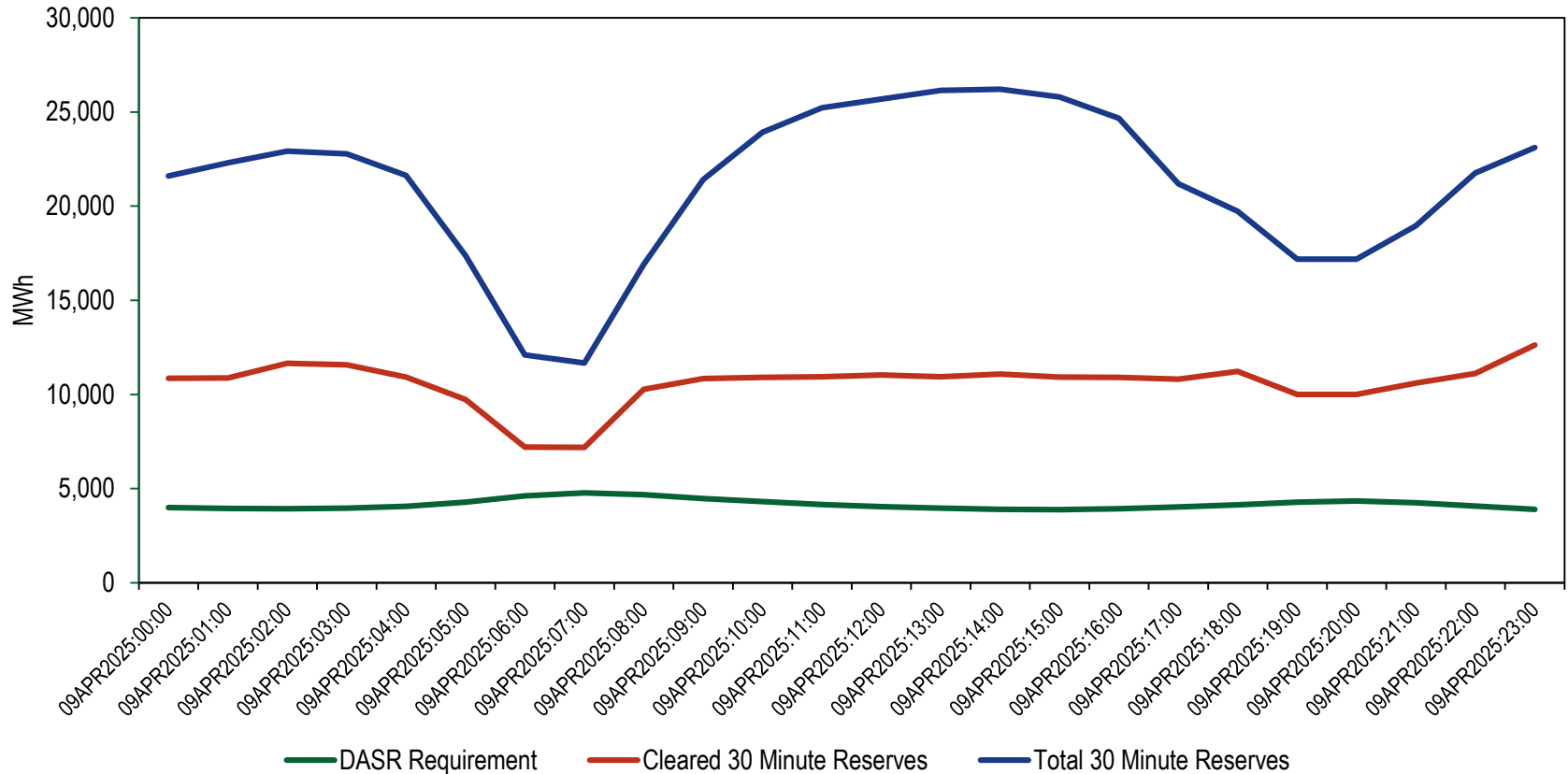
April 9 DA Market Results



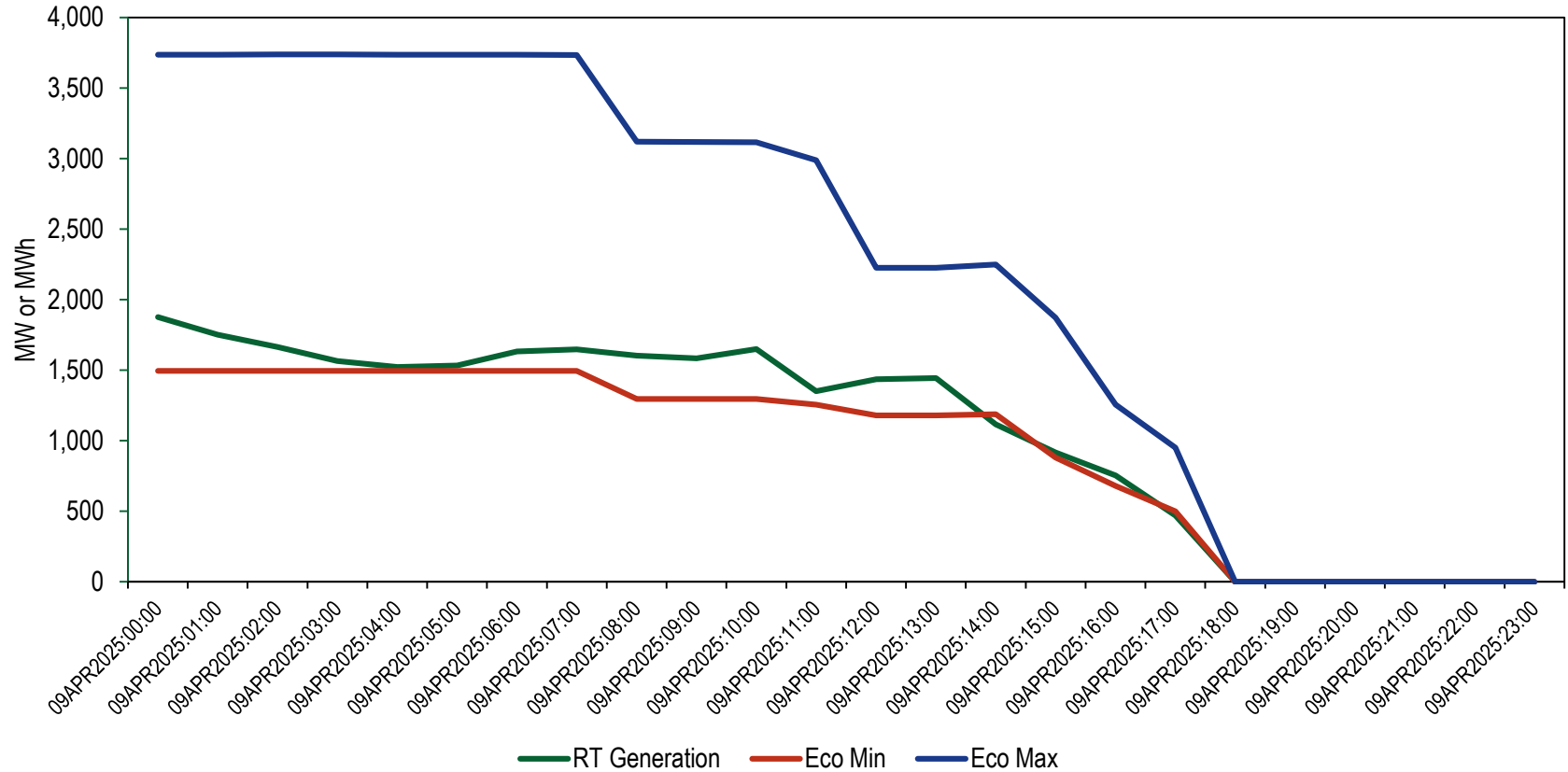
April 9 DA Market Results

- **Forecasted Peak Hour: 7:00**
 - **PJM Load Forecast: 106,010 MWh**
 - **Cleared Bid Load + Losses: 102,727 MWh (3,283 MWh below forecast).**
 - **Cleared Bid Load + Losses + Cleared Net Virtuals: 101,127 MWh (4,883 MWh below forecast).**
- **Supply versus demand**
 - **PJM Load Forecast + Cleared Net Exports: 108,378 MWh**
 - **Cleared Generation + Econ DR: 103,496 MWh (4,882 MWh below forecast + net exports).**

DA 30 Minute Reserves



Post DA MW



Post DA Commitment Results

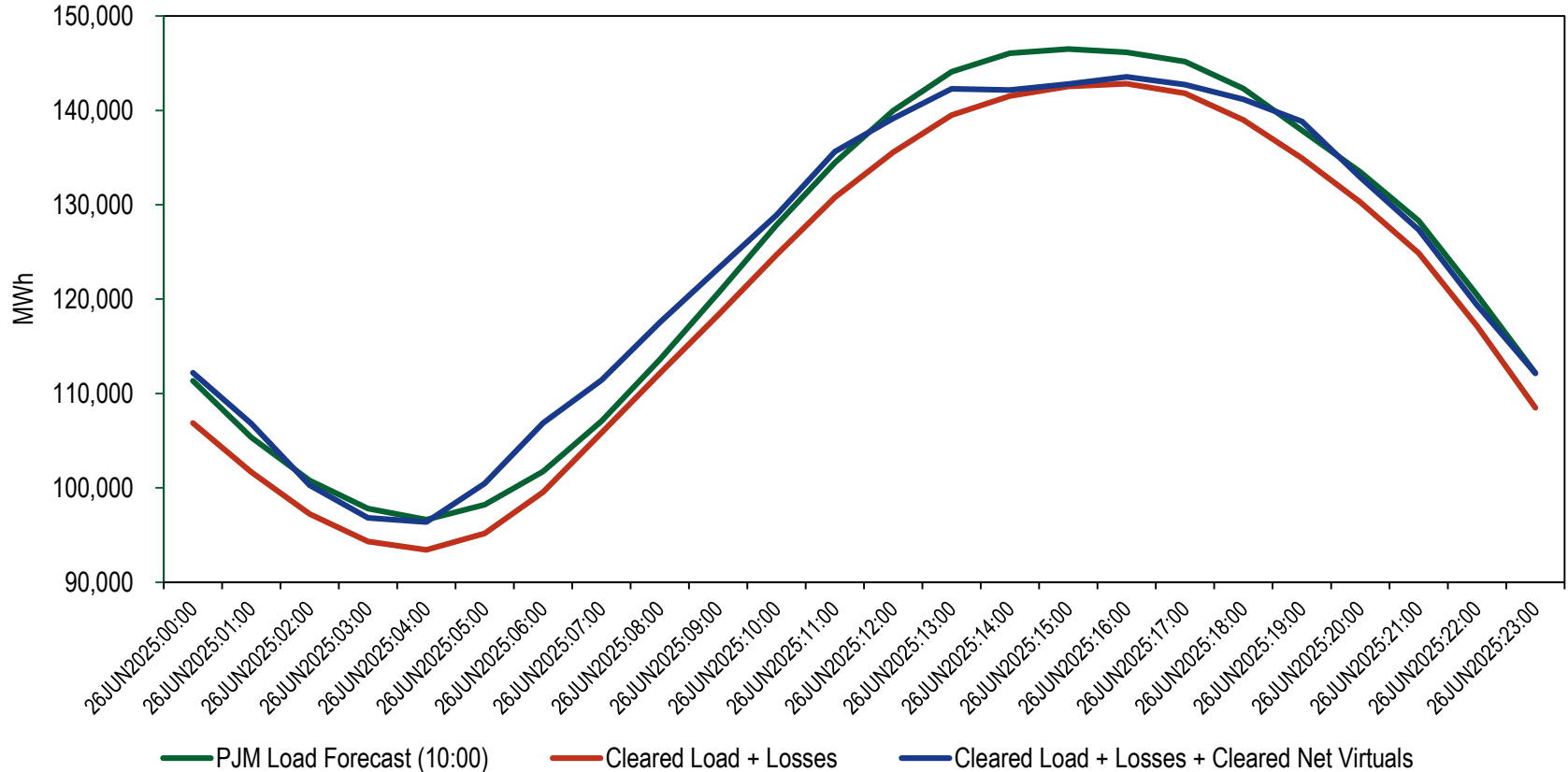
- **Ten of the eleven units received uplift.**
- **Total uplift was \$562,386.**
 - **Some paid by RT Load + RT Exports**
 - **Some paid by Deviations**
 - **Share cannot be disclosed due to confidentiality rules.**
- **Average offer: \$40/MWh**
- **Average LMP: \$17/MWh**

June 26, 2025 Post DA Commitments

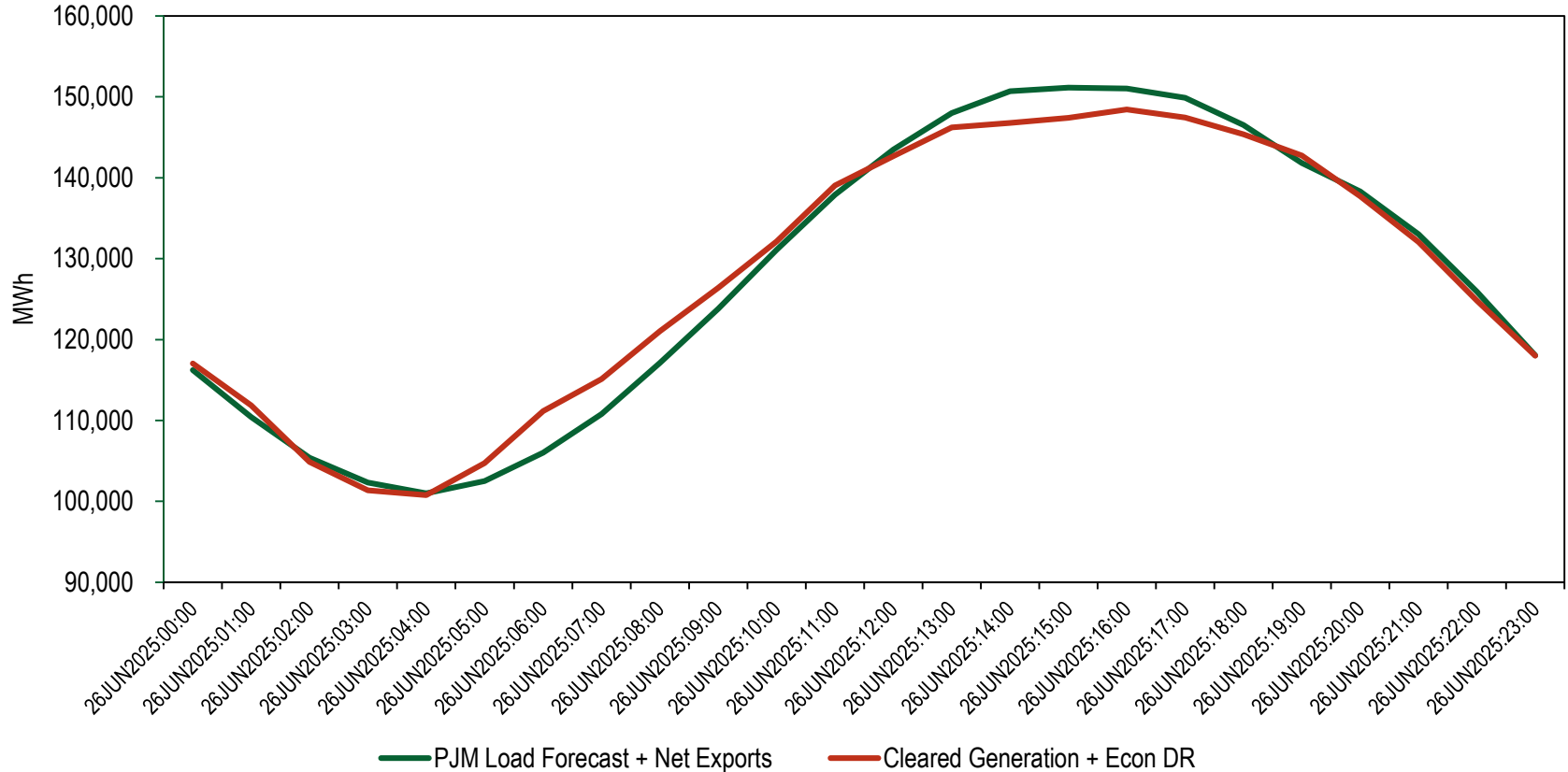
- **Eight units committed after the DA market.**
 - **Four for transmission constraints.**
 - **Four for economics.**



June 26 DA Market Results



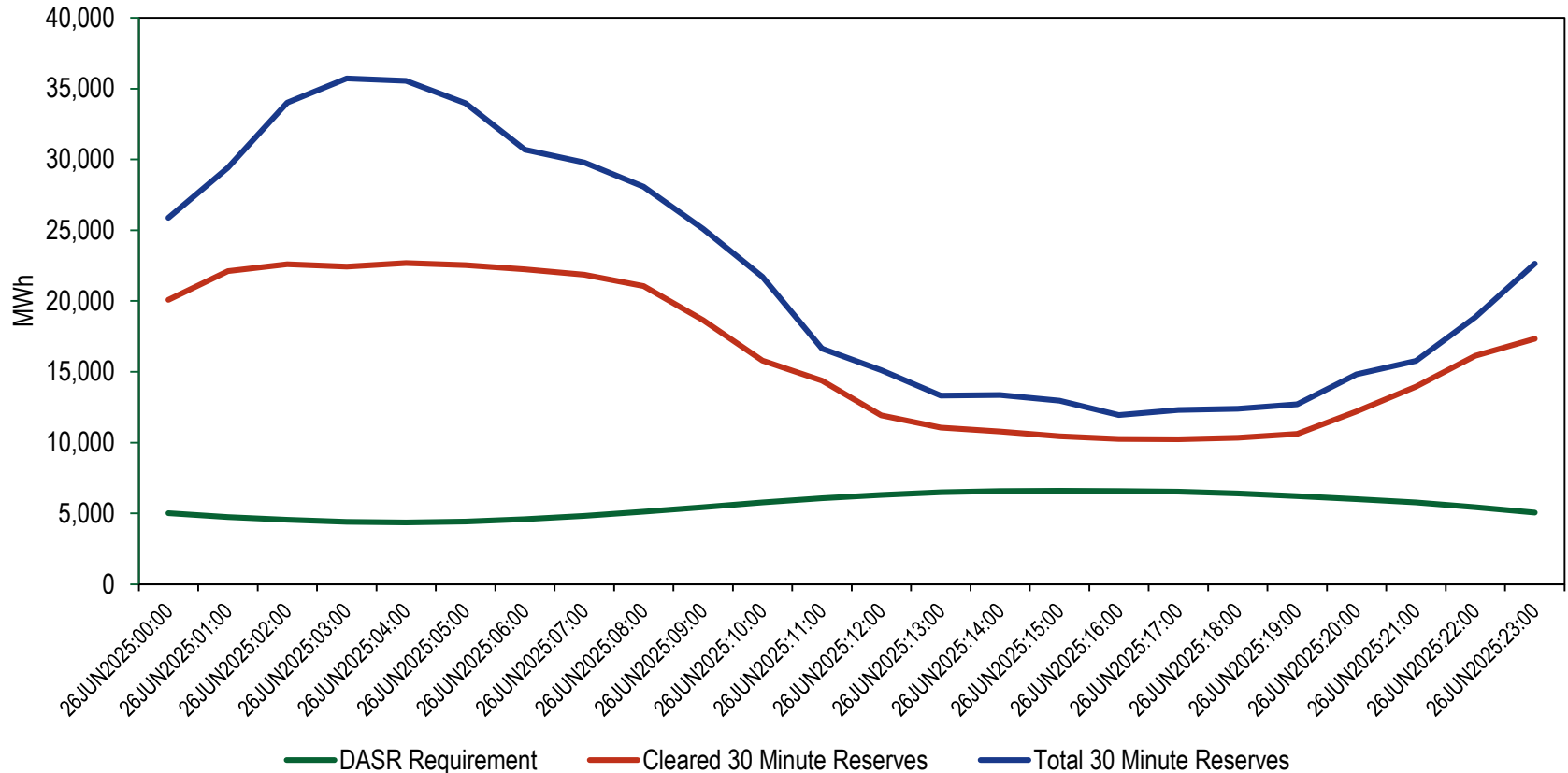
June 26 DA Market Results



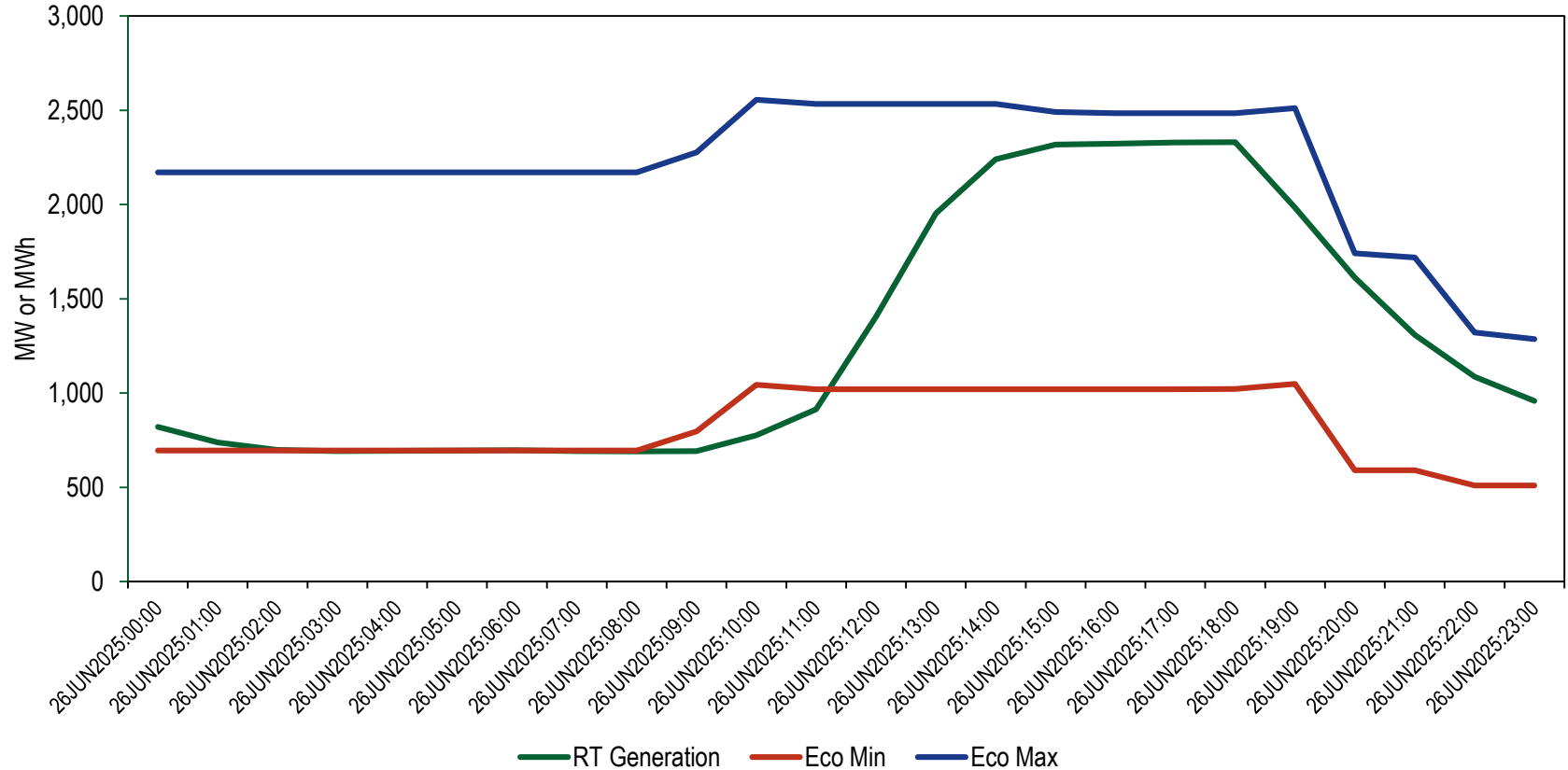
June 26 DA Market Results

- **Forecasted Peak Hour: 15:00**
 - **PJM Load Forecast: 146,504 MWh**
 - **Cleared Bid Load + Losses: 142,544 MWh (3,960 MWh below forecast).**
 - **Cleared Bid Load + Losses + Cleared Net Virtuals: 142,785 MWh (3,719 MWh below forecast).**
- **Supply versus demand**
 - **PJM Load Forecast + Cleared Net Exports: 151,130 MWh**
 - **Cleared Generation + Econ DR: 147,410 MWh (3,720 MWh below forecast + net exports).**

DA 30 Minute Reserves



Post DA MW



Post DA Commitment Results

- **Five of the eight units received uplift.**
- **Total uplift was \$1,246,230.**
 - **All paid by Deviations**
- **Average offer: \$120/MWh**
- **Average LMP: \$80/MWh**

