

# Memorandum

**To:** ISO Board of Governors

**From:** Eric Hildebrandt, Executive Director, Market Monitoring

**Date:** December 9, 2021

**Re:** Department of Market Monitoring update

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***This memorandum does not require Board action.***

## EXECUTIVE SUMMARY

This memo provides a summary of key aspects of market performance during summer 2021 which are included in DMM's Q3 report on market issues and performance.

- Overall performance of the day-ahead and real-time markets remained highly competitive, despite several periods of extremely high region-wide loads and prices.
- Lower peak loads helped keep the ISO market structure and prices competitive. Summer load peaked at about 44,000 MW on September 8, compared to a peak of over 47,000 MW in 2020 and a one-in-two forecast for 2021 of about 46,000 MW.
- Despite lower loads, overall prices increased due to significantly higher gas prices.
- During high load periods, bilateral market prices in other balancing areas were often significantly higher than ISO market prices, reflecting extremely tight supply conditions in these other regions.
- Demand for exports to balancing areas in the southwest increased and net imports into the ISO decreased significantly during net peak hours on many high load days.
- Due to changes made last year to the ISO's process for setting export scheduling priorities, significant volumes of exports clearing the day-ahead market were curtailed through the residual unit commitment process on the highest load days. On these days, some of these exports rebid into the real-time market cleared, ultimately meeting high demand in other regions.
- The volume of energy wheeled through the ISO balancing area increased considerably, but remained relatively low most hours. In 2020, a maximum of about 150 MW of wheeling transactions were scheduled in August and September. In 2021, maximum wheeling volumes totaled 1,200 MW in June and about 700 MW in August and September. Most of these schedules involved power from the northwest wheeling to balancing areas in the southwest.

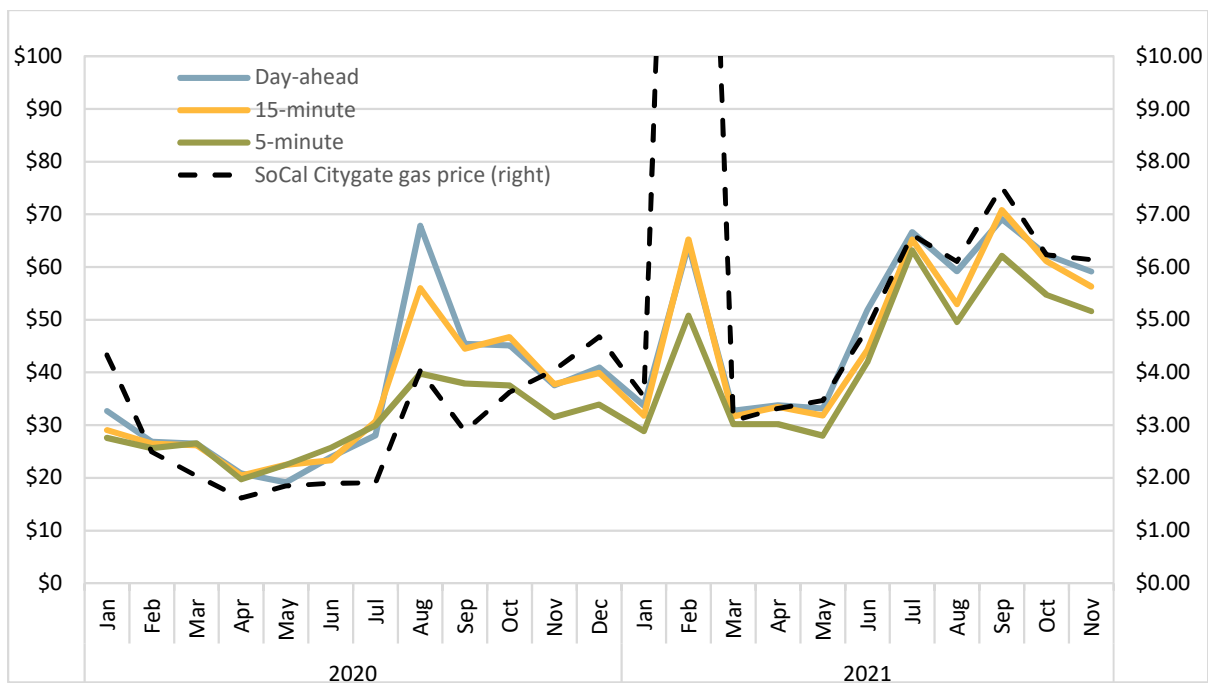
- Changes to the ISO’s process for setting wheeling scheduling priorities were implemented in August 2021, but no wheel through schedules were curtailed as a result of these changes.

## OVERALL MARKET PERFORMANCE

Overall performance of the day-ahead and real-time markets in summer 2021 remained highly competitive, despite several periods of extremely high region-wide loads and prices. As shown in Figure 1, average prices from June to September were somewhat higher in 2021 than in 2020. The higher prices in these months reflect a combination of higher region-wide load and higher gas prices.

Electricity prices in western states typically follow natural gas price trends because gas units are often the marginal source of generation in the ISO and other regional markets. The black dashed line in Figure 1 represents the monthly average gas price at SoCal Citygate. Higher gas prices in Southern California often result in higher electricity prices across the ISO footprint because gas resources in the south are often marginal on a system level.

**Figure 1. Average ISO energy market prices (2020 and 2021)**

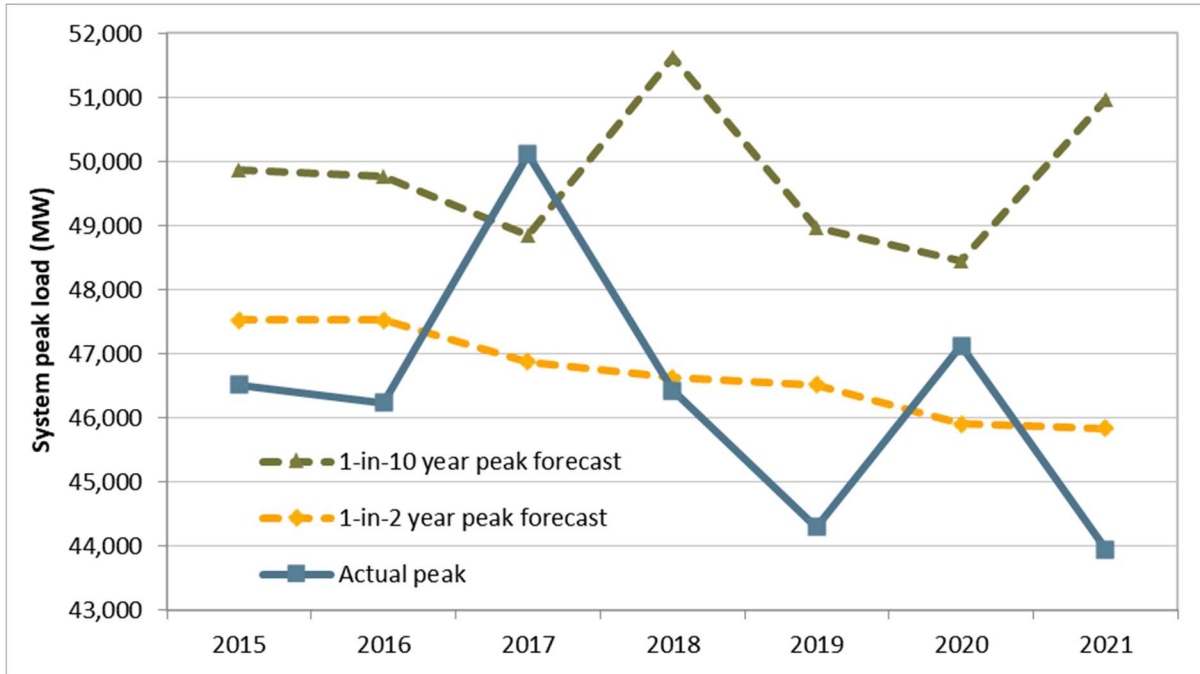


Lower peak loads helped offset higher gas prices and keep the ISO market structure and prices competitive most hours. As shown in Figure 2, summer load peaked at about 44,000 MW on September 8th, compare to a peak of over 47,000 MW in 2020 and a one-in-two forecast for 2021 of about 46,000 MW.

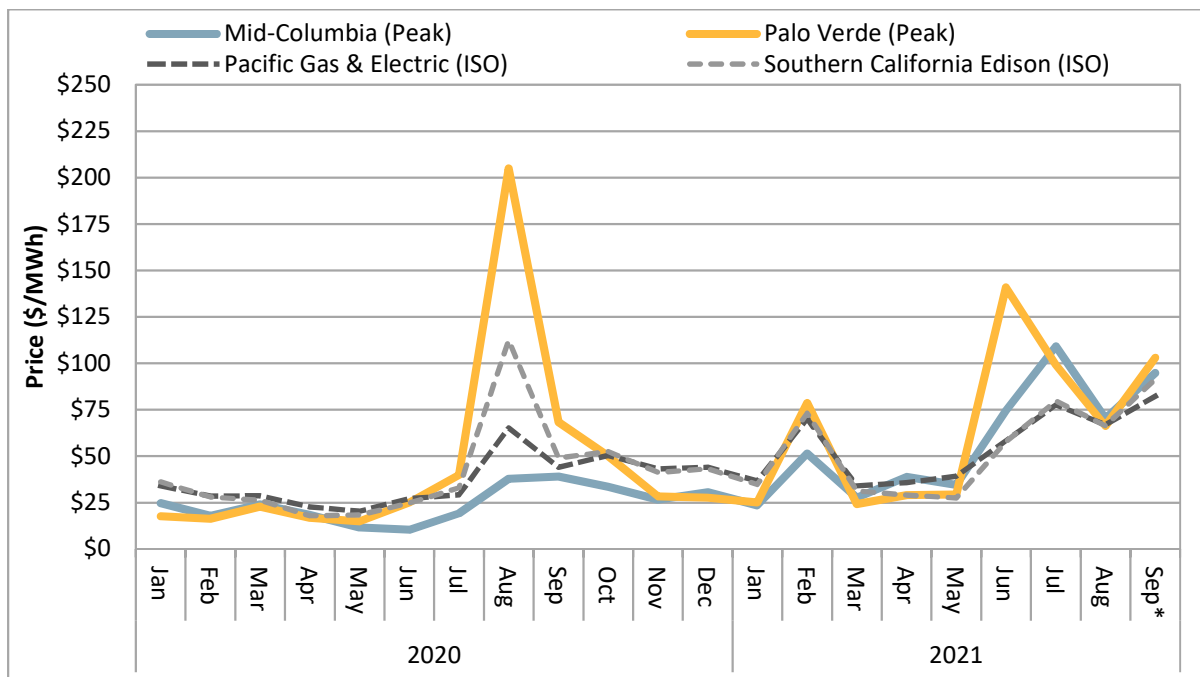
During high load periods, bilateral market prices in some other balancing areas were often significantly higher than ISO market prices, reflecting extremely tight supply conditions in these other regions. On June 17, 2021, prices at Mead and Palo Verde hubs exceeded the \$1,000/MWh

WECC soft offer cap, requiring sellers to submit cost justification for sales made above this cap to FERC.

**Figure 2. Peak summer loads and forecasts (2015-2021)**



**Figure 3. Average peak hour bilateral and ISO prices (2020 and 2021)**



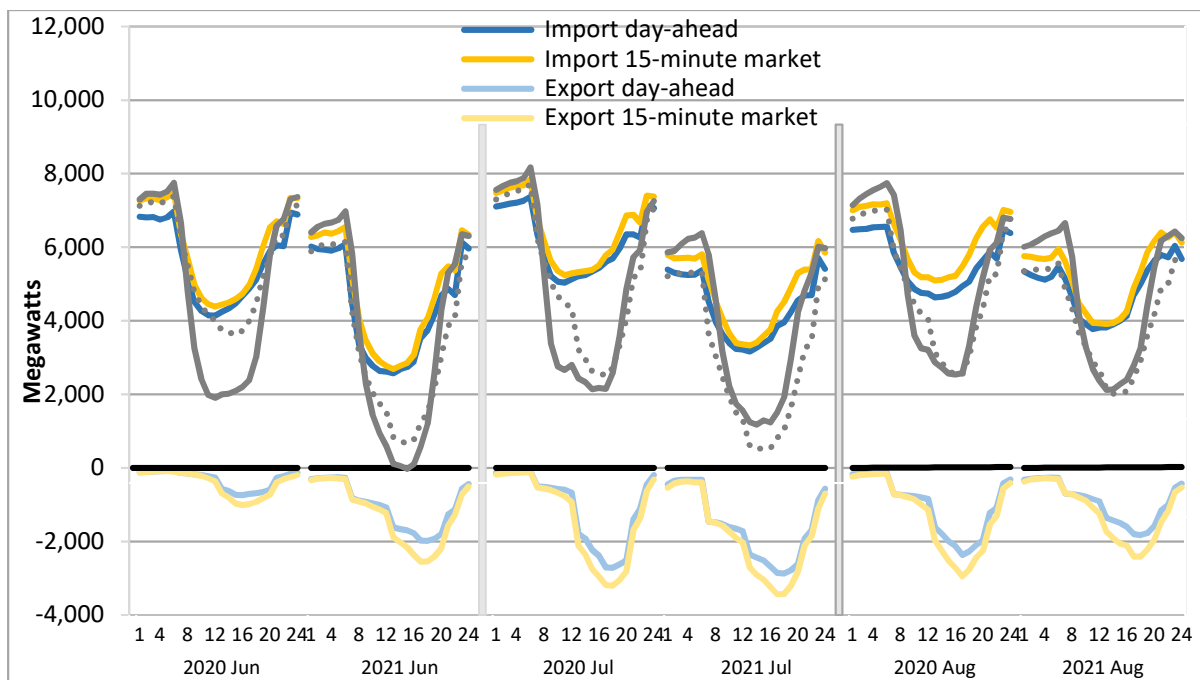
As shown in Figure 3, monthly average peak hour prices at Palo Verde, a major hub in the Southwest (shown in yellow), exceeded prices in the ISO during the months June to September in both 2020 and 2021. In 2021, monthly average prices at Mid-Columbia, a major hub in the Northwest, also exceeded prices in the ISO in June, July, and in the early part of September.

### EXPORTS AND NET IMPORTS

Demand for exports to balancing areas in the southwest increased and net imports into the ISO decreased significantly during net peak hours on many high load days.

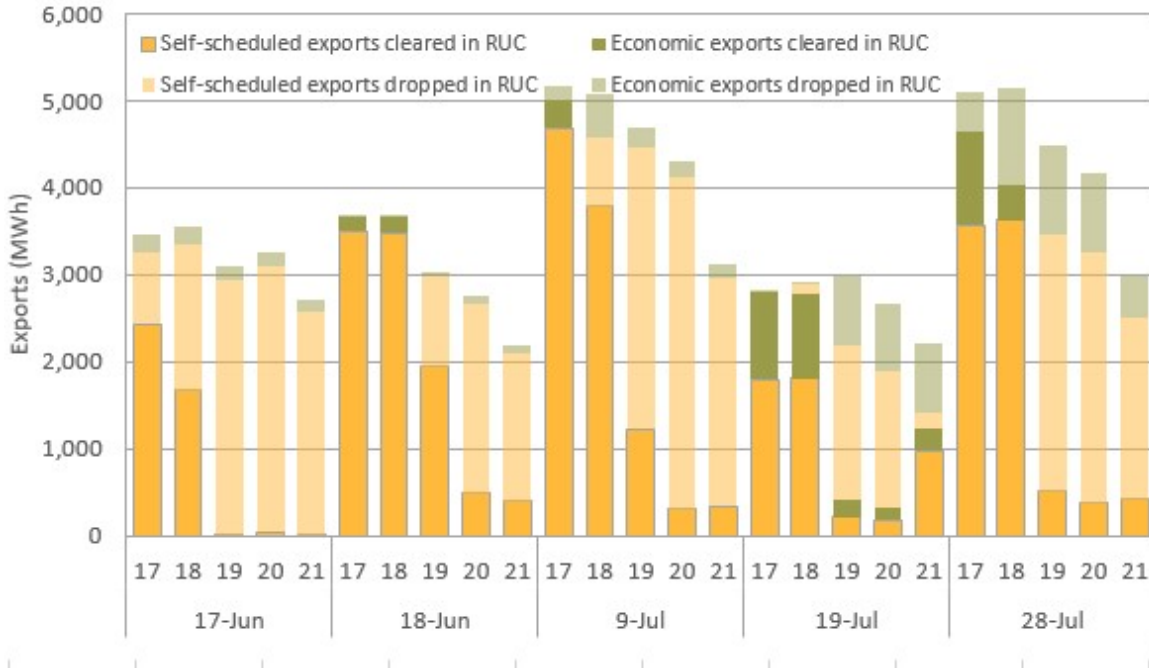
As shown in Figure 4, average gross imports were lower in June through August compared to 2020 (see darker yellow and blue lines). Meanwhile, gross exports were up significantly in June compared to the year before and remained about equal in July and August compared to 2020 (see lighter yellow and blue lines). As a result of these two trends, average net imports were lower in each month as well -- with and without inclusion of transfers made through the Western Energy Imbalance Market.

**Figure 4. Average hourly imports and exports by month (2020 and 2021)**

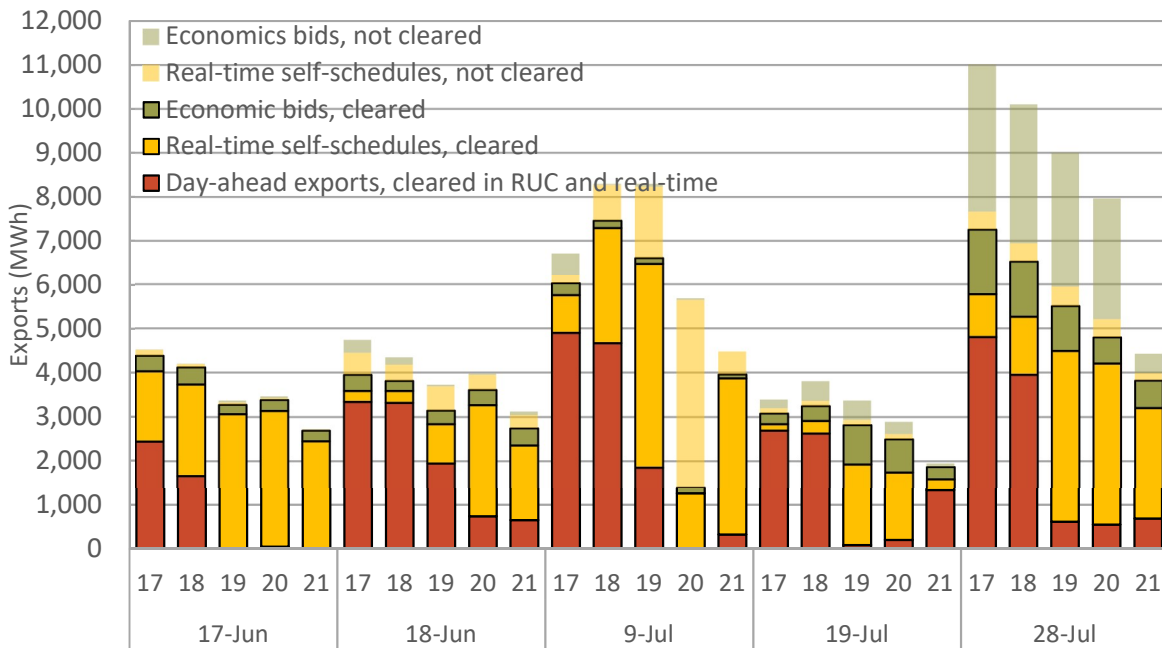


As a result of changes made in September 2020 to the ISO’s process for setting export scheduling priorities, significant volumes of exports clearing the day ahead market were curtailed through the residual unit commitment process on most of the highest load days. As show in Figure 5, on some high load days, more than 2.5 GW of exports that cleared in the day-ahead market were cut in the residual unit commitment process (see light yellow bars).

**Figure 5. Day-ahead exports clearing and not clearing the residual unit commitment process during net peak hours on high load days**



**Figure 6. Real-time export schedules and bids during net peak hours on high load days**



Exports that clear the day-ahead process are automatically scheduled in the real-time market with a relatively high scheduling priority, while exports that do not clear the residual unit commitment process are not. Some day-ahead market exports that did not clear the residual unit commitment process were rebid into the real-time market and cleared, ultimately meeting high demand in other regions.

As shown in Figure 6, real-time exports on these days included exports with day-ahead priority, as well as lower priority self-schedules and economic bids entered in the real-time market. As shown by the yellow bars in Figure 6, most real time self-schedules which had not cleared the day-ahead market cleared in the real-time market (see light and dark yellow bars).

By limiting the quantity of exports entering the real-time market with a scheduling priority above native load to the quantity feasible in the residual unit commitment process, market rule changes implemented in September 2020 more effectively position the ISO's market to reliably meet both native load and day-ahead high-priority export demand in the real-time market in the summer of 2021.

### **Wheeling schedules**

The volume of energy wheeled through the ISO balancing area increased considerably in summer, but remained relatively low most days. In 2020, a maximum of about 150 MW of wheeling transactions were scheduled in August and September. In 2021, maximum wheeling volumes totaled 1,200 MW in June and about 700 MW in August and September. Most of these schedules involved North-to-South source/sink combinations, representing power from the northwest being wheeled to balancing areas in the southwest.

Figure 7 shows the volume and directional flow of day-ahead wheels into and out of the ISO system in summer 2021.<sup>1</sup> NP26 refers to northern California or the region north of Path 26. Likewise, SP26 refers to southern California for the region South of Path 26. As shown in Figure 7, about one-third of wheels are imported into NP26, with two-third being imported into SP26 (which includes imports from the northwest on the Pacific DC Intertie). Almost all wheels are exported from SP26 into balancing areas in the southwest.

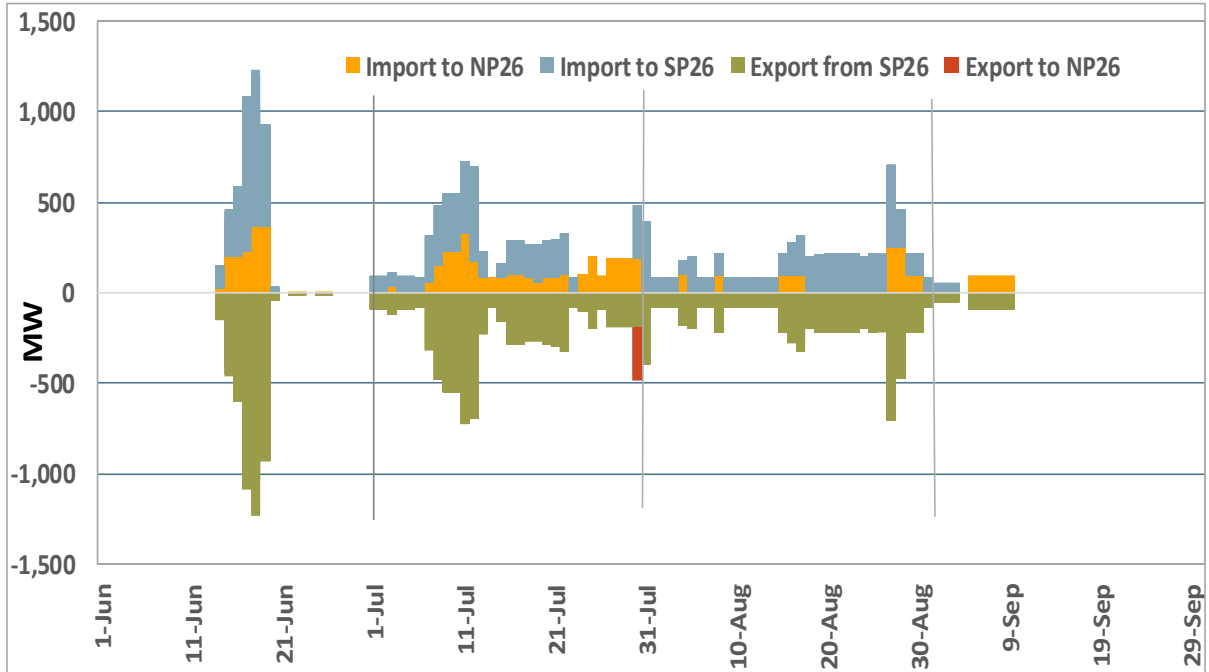
Tariff changes implemented in August 2021 established two categories of self-scheduled wheel-through transactions: high-priority (PT) and low-priority (LPT) self-scheduled wheels. High-priority wheels are required to register with the ISO ahead of time and must be supported by a firm power supply contract to serve the load of an external load-serving entity, as well as monthly firm transmission to the CAISO border. High-priority wheels will have priority equal to or above CAISO native load, while low-priority wheels will have priority below load.

Figure 8 shows the total amount of high-priority wheeling capacity registered in August and September, along with the portion of this capacity that was actually scheduled in the day-ahead market during the net peak hours of each day.

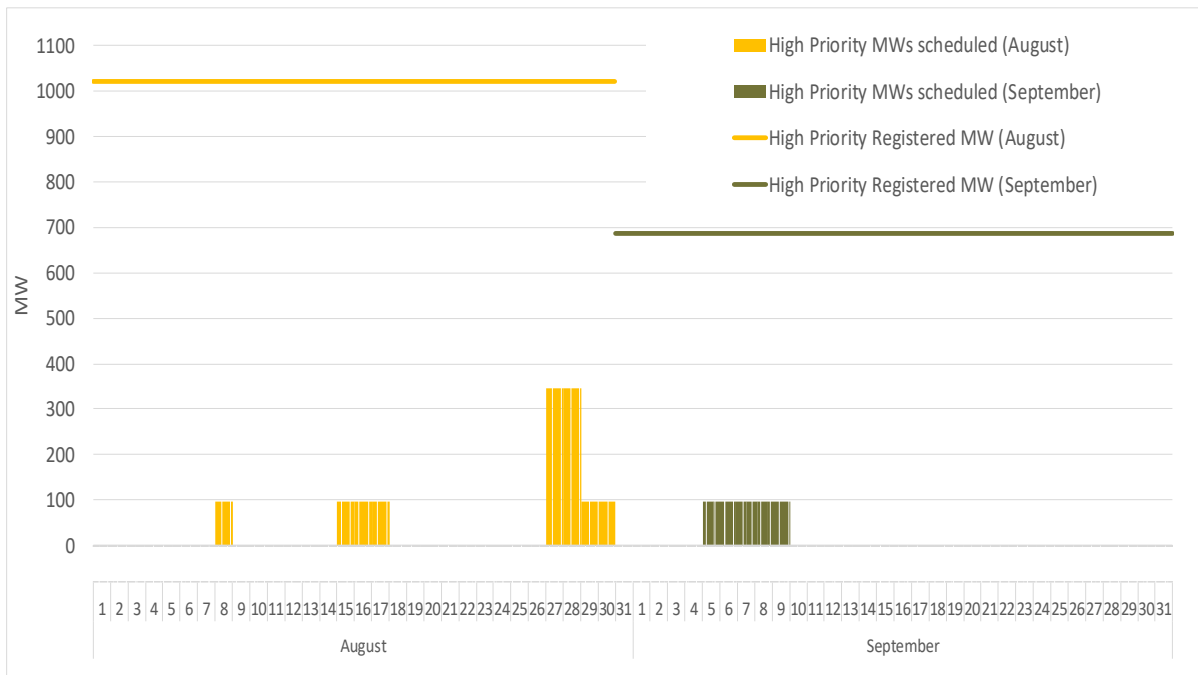
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<sup>1</sup> Data exclude wheeling schedules on Existing Transmission Rights (ETCs) and Transmission Ownership Rights (TORs).

**Figure 7. Regional source and sink of day-ahead wheels  
(Hour 17-21 between June 1 and September 31)**



**Figure 8. High-Priority Wheels Registered and Scheduled  
(Hour ending 7-22 between August 1 and September 31)**



As shown in Figure 8:

- In August, a total of 1,021 MW were registered as high-priority wheel-through transactions. However, this capacity was scheduled in the day-ahead market on only seven days. A total of 346 MW was scheduled on August 28 and 29, with about 96 MW per hour were scheduled on five other days.
- In September, 687 MW of high-priority wheels were registered. Only 96 MW of this capacity was scheduled in the net peak hours of the month.

Ultimately, however, no low-priority or high-priority wheeling schedules were curtailed in summer 2021.