



# Memorandum

**To:** WEIM Governing Body and ISO Board of Governors

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

**Date:** November 1, 2023

**Re:** Department of Market Monitoring update

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***This memorandum does not require WEIM Governing Body or ISO Board of Governors action.***

## EXECUTIVE SUMMARY

The memo provides a short summary of market conditions and performance of the California ISO and the other Western Energy Imbalance Market (WEIM) balancing areas during the third quarter of 2023 (Q3). As summarized in this memo:

- Despite some periods of high loads and prices, overall prices in the ISO and the other WEIM balancing areas remained competitive in the third quarter. From July to September, systemwide prices in the WEIM averaged about \$58/MWh compared to average gas prices of almost \$5/MMBtu in the ISO area, and just under \$3/MMBtu within the WEIM.
- Conditions in the ISO area benefitted from the addition of over 7,000 MW of new capacity from batteries, solar, and hybrid capacity. Total installed capacity in the ISO area totaled about 84,000 MW with average hourly generation of almost 29,000 MWh in summer 2023.
- About 13 percent of total generation connected to the ISO grid came from hydro with about 34 percent from other renewables in Q3. About 37 percent came from natural gas, with about 10 percent from nuclear. Net imports accounted for about 4 percent of generation in Q3 2023, compared to about 11 percent in 2022.
- Total installed capacity in the rest of the WEIM totaled about 87,000 MW with average hourly generation of over 42,000 MW in Q3 2023.
- In the WEIM, about 56 percent of grid connection generation came from natural gas, with about 20 percent from coal. About 11 percent was supplied by hydro, with about 13 percent from grid-connected wind and solar.
- Imports into the ISO grid from the other western states dropped from an average of about 5,100 MWh in Q3 2022 to about 3,900 MWh in 2023.
- The trend toward increased imports in the southwest balancing areas continued, with more energy coming from the northwest, and from fewer net imports into the ISO.

A more detailed report on market performance from July through September will be provided in DMM’s Q3 report on market issues and performance.

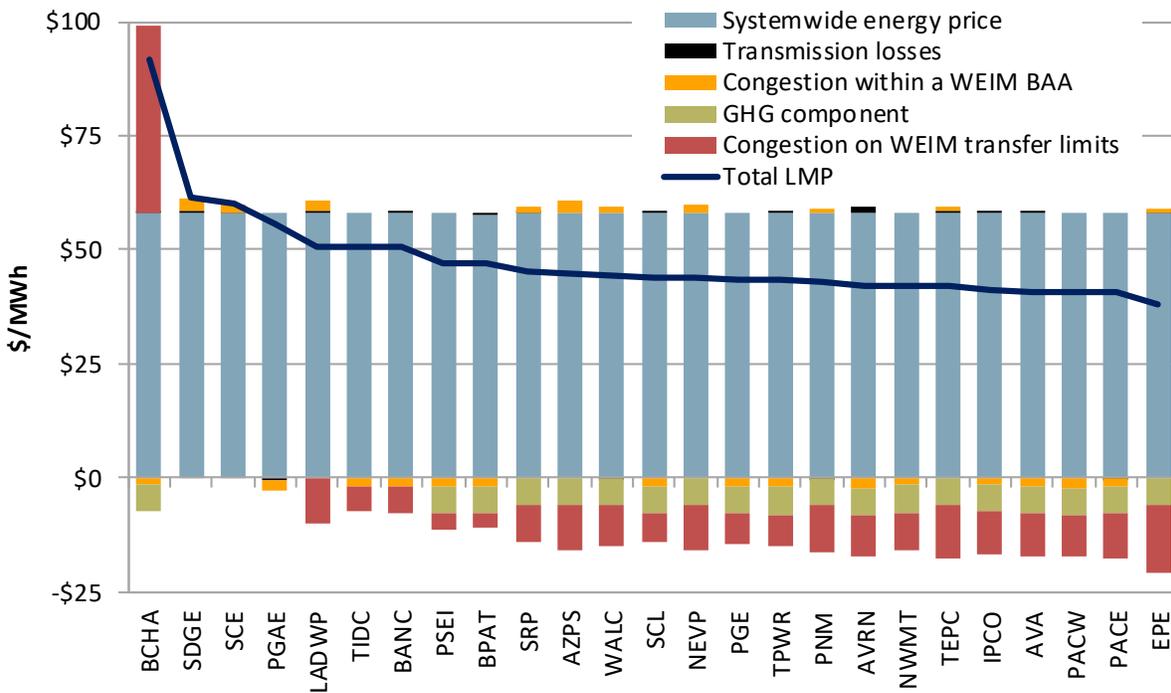
**MARKET TRENDS**

**Real-time market prices by balancing area**

Figure 1 shows average locational marginal prices from the 15-minute market during Q3 for the major areas within the California ISO (PGE, SCE and SDGE), and all other balancing areas in the WEIM. The system marginal energy price is the same for all entities in each hour. The price difference between balancing authority areas is determined by differences in transmission losses, greenhouse gas compliance costs, congestion, and power balance constraint violations. The red segments reflect price differences caused by congestion on transfer constraints, including any power balance constraint relaxations that increase the price in a single area.

Despite some periods of high loads and prices, overall prices in the ISO and the other WEIM balancing areas remained competitive in the third quarter. Systemwide prices averaged about \$58/MWh compared to average gas prices of almost \$5/MMBtu in the ISO area and less than about \$3/MMBtu in the WEIM.

**Figure 1. Average monthly prices by balancing authority area (July - September 2023)**

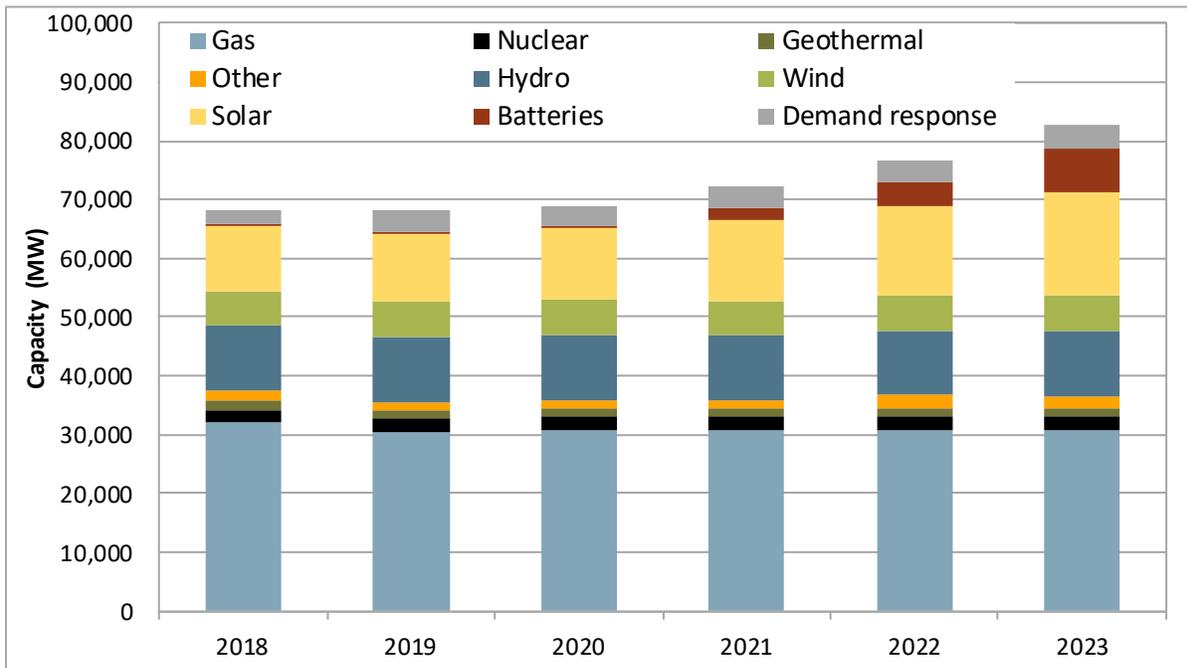


### Capacity and energy in the California ISO

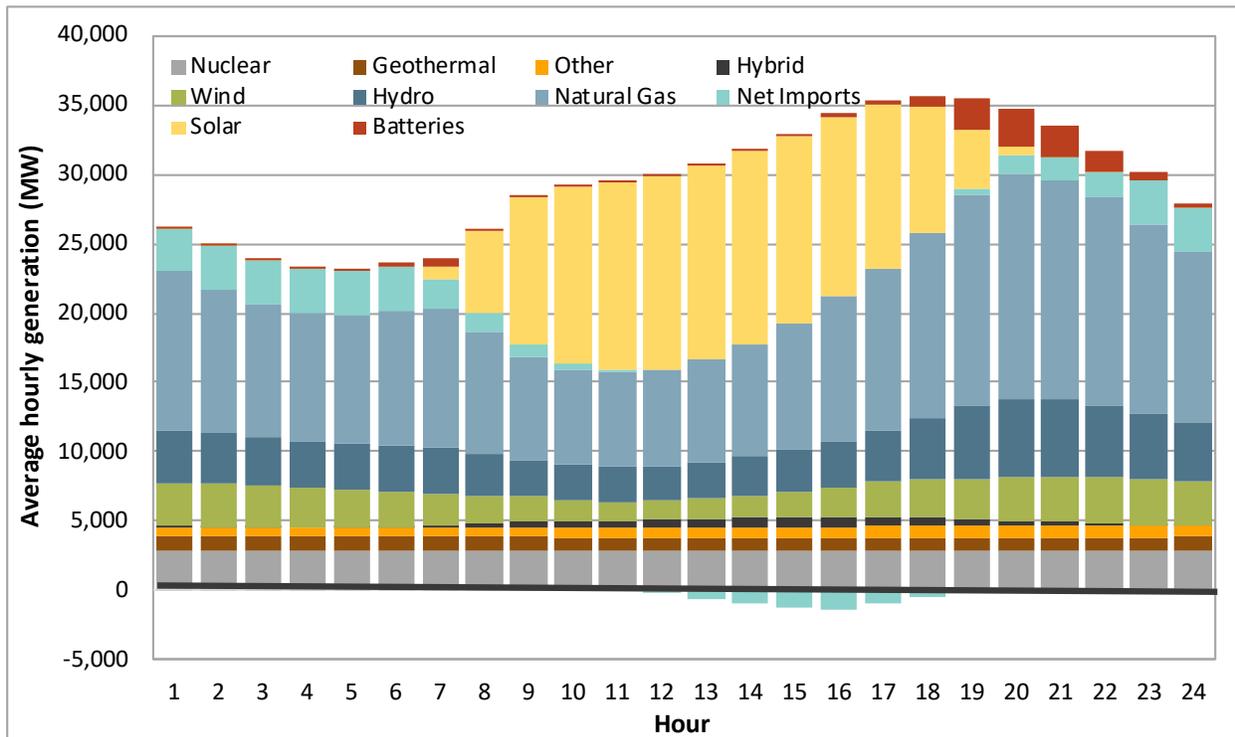
Figure 2 shows total installed capacity by fuel type in the ISO area from 2018 to 2023. Figure 3 shows average generation by fuel type for the ISO area for each operating hour from July to September 2023. As shown in these figures:

- Total installed capacity in the ISO area totaled about 84,000 MW with average hourly generation of almost 29,000 MWh in summer 2023.
- Conditions in the ISO area benefitted from the addition of over 7,000 MW of new capacity from batteries, solar, and hybrid capacity.
- Batteries accounted for about 7,300 MW (or 9 percent) of total installed capacity in the ISO.
- About 13 percent of total generation connected to the ISO grid came from hydro, with about 34 percent from other renewables.
- About 37 percent of generation came from natural gas, with about 10 percent from nuclear.
- Net imports accounted for about 4 percent of generation in Q3 2023, compared to about 11 percent in 2022.
- As shown by the aqua segments of Figure 3, the ISO was a net exporter on average during hours 13 to 18, but remained a net importer in the other hours of the day.

**Figure 2. Installed capacity in CAISO balancing area (2018 to 2023)**



**Figure 3. Average energy by operating hour in California ISO (July - September 2023)**

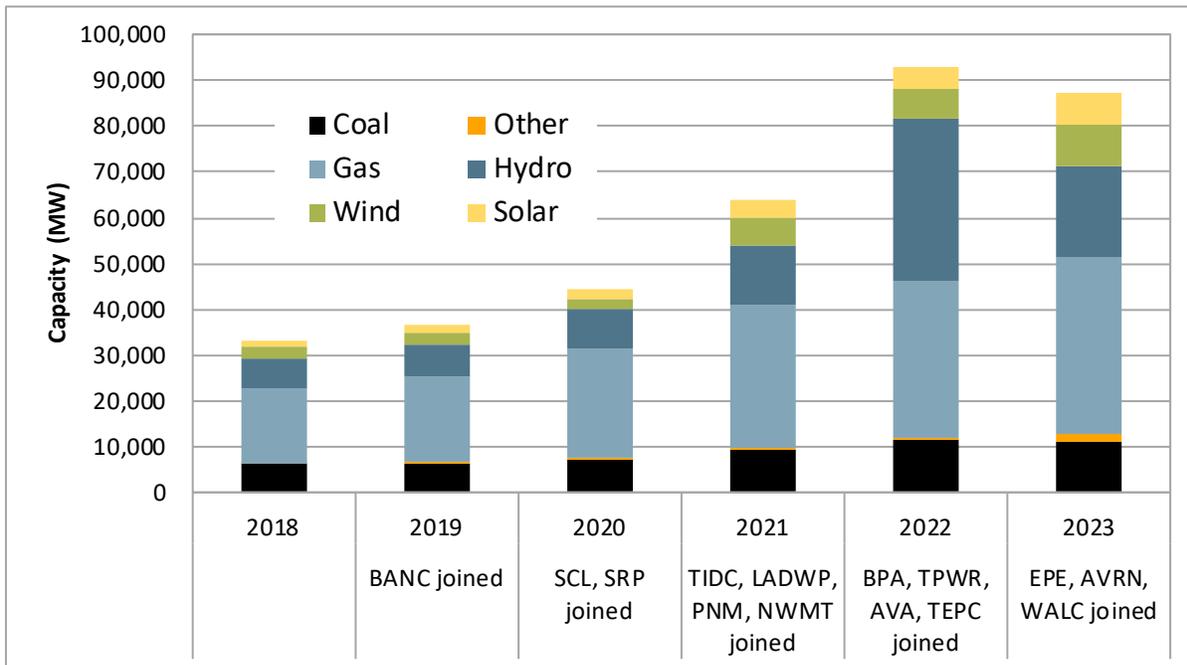


**Capacity and energy in WEIM balancing areas**

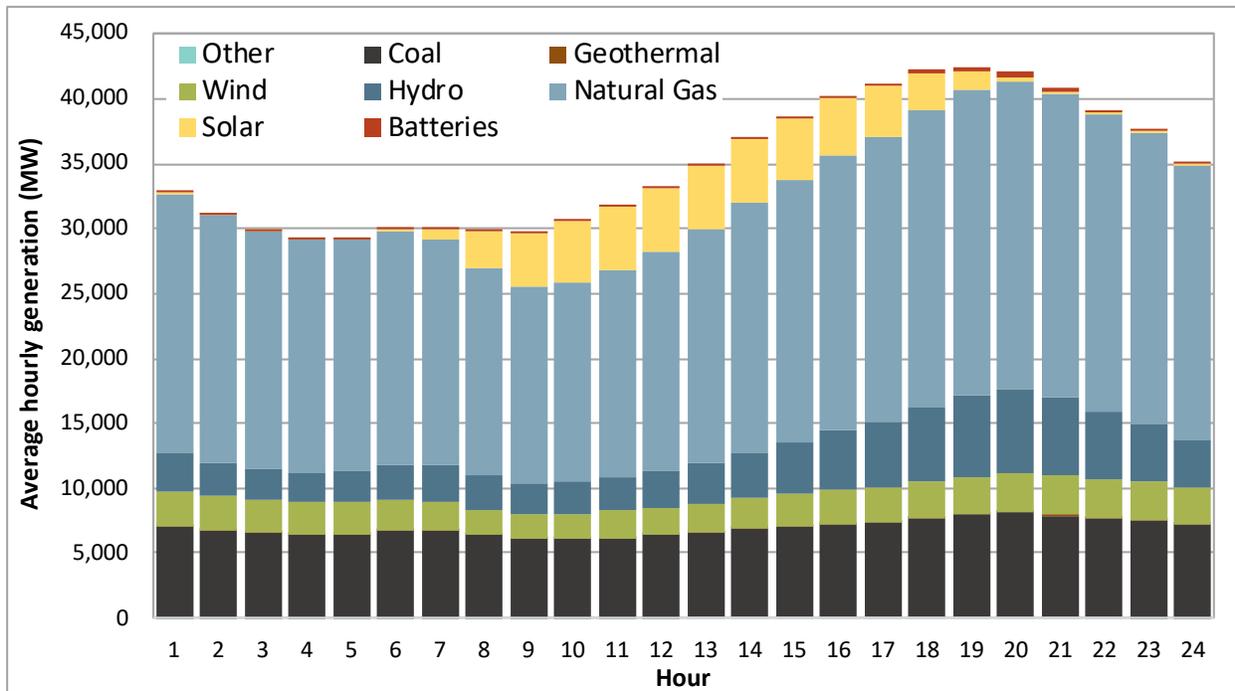
Figure 4 shows total installed capacity by fuel type in all of the other balancing areas of the WEIM from 2018 to 2023. Figure 5 shows average generation by fuel type for the WEIM from July to September 2023. As shown in these figures:

- Total installed capacity in the rest of the WEIM totaled about 87,000 MW with average hourly generation of over 42,000 MW in Q3 summer 2023.
- The amount of battery capacity in the WEIM increased to over 1,000 MW, but still accounts for only about 1.2 percent of total installed capacity.
- In the WEIM, about 56 percent of grid connected generation came from natural gas, with about 20 percent from coal.
- About 11 percent of generation was supplied by hydro, with about 13 percent from grid-connected wind and solar.

**Figure 4. Installed capacity in WEIM balancing area (2018 to 2023)**



**Figure 5. Average energy by operating hour in WEIM (July - September 2023)**



### Net imports and exports from the California ISO area

Figure 6 shows average hourly imports and exports for the ISO area by quarter from Q4 2021 to Q3 2023. As shown in this figure, net imports into the ISO dropped significantly in the third quarter of 2023 compared to last year. As shown by the blue and yellow lines in Figure 6, average exports from the ISO increased significantly in the day-ahead and 15-minute market during most hours. Average import into the ISO in the day-ahead and 15-minute market also decreased somewhat during most hours.

The dotted grey line in Figure 6 shows the ISO area’s average net interchange by hour before the WEIM, while the solid gray line shows net interchange after transfers made through the WEIM. The difference in these lines represent the average net transfers made through the WEIM between the ISO and the rest of the WEIM areas. As shown in Figure 6, exports from the ISO and the rest of the WEIM increased significantly in the hours when solar output was high. During the net peak hours, transfers from the WEIM into the ISO dropped slightly in Q3 compared to the prior year.

**Figure 6. Average hourly imports and exports for California ISO area (Q4 2021 to Q3 2023)**

