September 9, 2022

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: California Independent System Operator Corporation
Docket: ER15-2565-__
Independent Assessment by the Department of Market Monitoring
July 2022 Western Energy Imbalance Market Transition Period Report for Tacoma Power

Dear Secretary Bose:

The Department of Market Monitoring (DMM) hereby submits its independent assessment on the transition period of Tacoma Power (TPWR) during its first six months of participation in the Western Energy Imbalance Market (WEIM) for July 2022, as TPWR joined the WEIM on March 2, 2022.

Please contact the undersigned directly with any questions or concerns regarding the foregoing.

Respectfully submitted,

By: *_/s/ Eric Hildebrandt_*

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California Independent System Operator Corporation

California ISO

Report on Western Energy Imbalance Market issues and performance: Tacoma Power for July 2022

September 9, 2022

Prepared by: Department of Market Monitoring

Executive summary

Pursuant to the Commission's October 29, 2015 Order on the CAISO's Western Energy Imbalance Market (WEIM), the California ISO (CAISO) filed a report on August 25, 2022 covering the period from July 1 through July 31, 2022 (July report) for Tacoma Power (TPWR) in the Western Energy Imbalance Market.[1] TPWR joined the WEIM on March 2, 2022, and the transition period will apply to the TPWR balancing authority area (BAA) until September 31, 2022.[2]

This report provides a review by the Department of Market Monitoring (DMM) of Western Energy Imbalance Market performance for the TPWR balancing authority area during the period covered in the CAISO's July report. This is the fifth report for the transition period of the TPWR balancing authority area. Key findings in this report include the following:

- Prices in the TPWR area tracked closely with prices in the North WEIM region, and continued to be lower than prices at the Pacific Gas and Electric (PG&E) default aggregation point within the CAISO.
- The TPWR balancing authority area failed the upward and downward sufficiency tests during 1 interval and 14 intervals, respectively. TPWR the upward and downward capacity tests during 1 interval and 19 intervals, respectively.
- There was 1 valid under-supply infeasibility in the 15-minute market and 2 in the 5-minute market. There was 1 valid over-supply infeasibilities in the 5-minute market and none in the 15-minute market.
- Transition period pricing decreased TPWR area prices in the 15-minute and 5-minute markets by $0.25/MWh and $0.16/MWh, respectively.

Section 1 of this report provides a description of prices and power balance constraint relaxations and Section 2 discusses the flexible ramping sufficiency and bid range capacity tests.

[1] The CAISO's July 2022 Report was filed at FERC on August 25, 2022 and posted on the CAISO website on August 26, 2022: http://www.caiso.com/Documents/Aug25-2022-Jul2022-WEIMTransitionPeriodReport-TacomaPower-ER15-2565.pdf

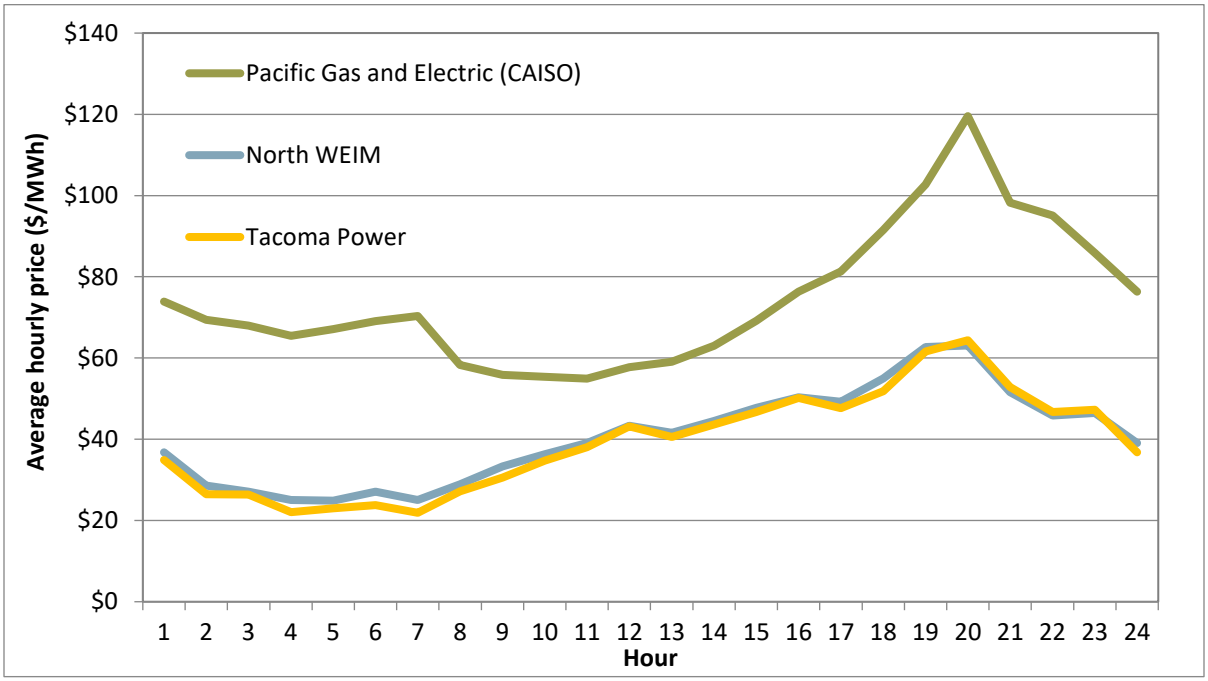
[2] This follows from the application of CAISO Tariff section 27(b)(1), which refers to a number of months rather than a number of days.

1 Western Energy Imbalance Market prices

Figure 1.1 and Figure 1.2 show hourly average 15-minute and 5-minute prices during July for TPWR compared with prices in the CAISO at the Pacific Gas and Electric (PG&E) default load aggregation point and the average North WEIM regional prices.[3] Figure 1.3 shows the average hourly 5-minute locational marginal price (LMP) by component for the Tacoma Power area.

Average prices in the Tacoma Power area tracked closely with prices in the North WEIM region, and continued to be lower than prices at the Pacific Gas and Electric (PG&E) default aggregation point within the CAISO. For the month, TPWR prices averaged $39.27/MWh in the 15-minute market and $32.80/MWh in the 5-minute market. The prices in the area were driven down by congestion on internal CAISO constraints and WEIM transfer constraints throughout the day.

Figure 1.1 Average hourly 15-minute price (July 2022)



[3] The North WEIM region includes PacifiCorp West, Portland General Electric, Puget Sound Energy, Seattle City Light, and Powerex. Avista Utilities, Tacoma Power, and the Bonneville Power Administration are located in the North WEIM region but are not included the regional average for this analysis.

Figure 1.2 Average hourly 5-minute price (July 2022)

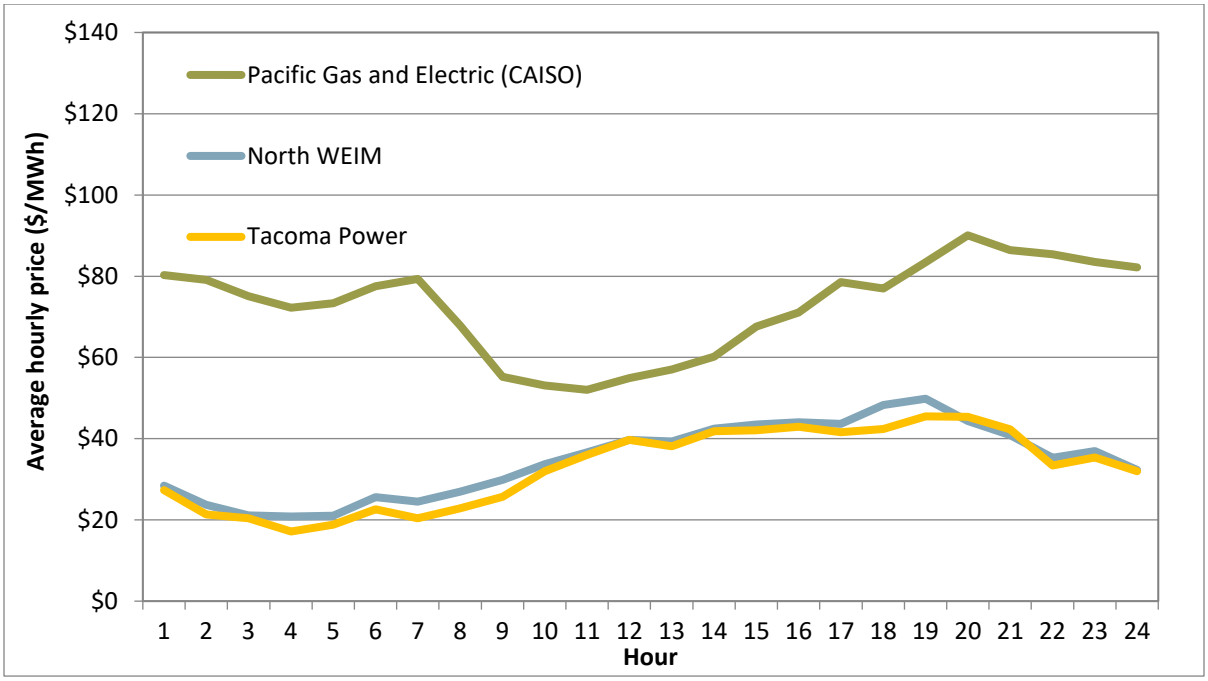
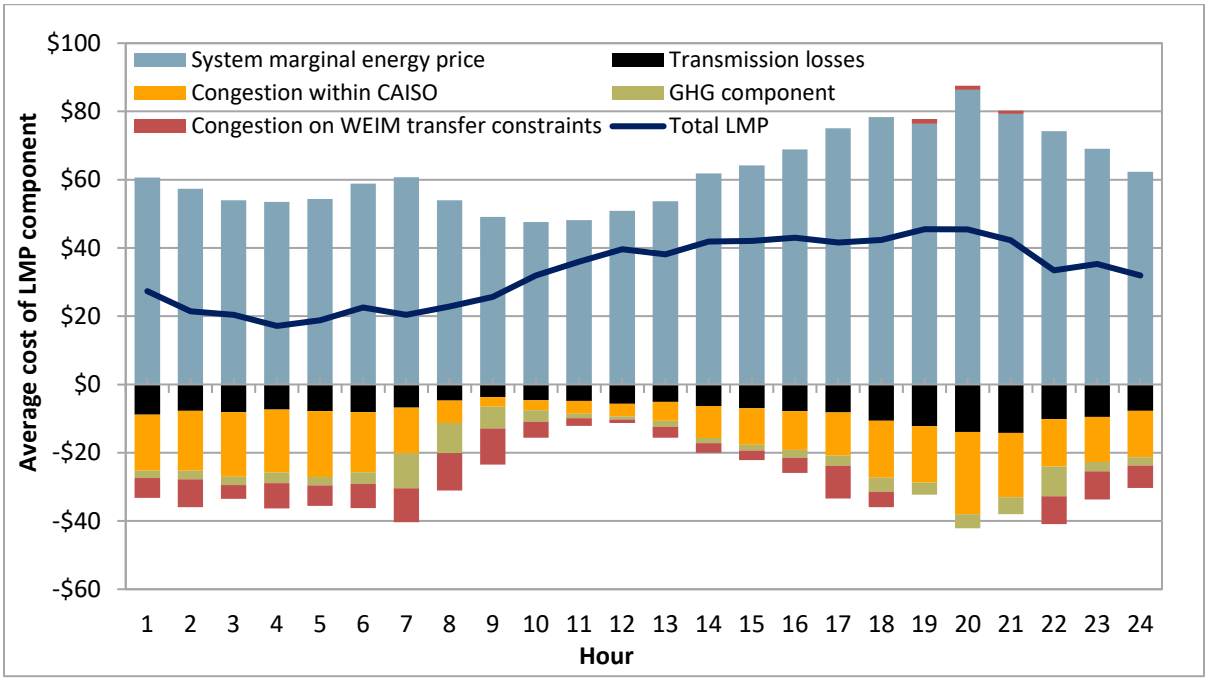


Figure 1.3 Average hourly 5-minute LMP by component (July 2022)



All power balance constraint relaxations that occurred in July were subject to the six-month transition period pricing that expires on September 1, 2022.[2] The transition period pricing mechanism sets prices at the highest cost supply bid dispatched to meet demand rather than at the $1,000/MWh penalty parameter while relaxing the constraint for shortages, or the $155/MWh penalty parameter while relaxing the constraint for excess energy.[4] [5] Power balance constraint relaxations can be grouped in the following categories:

- **Valid under-supply infeasibility** (power balance constraint shortage). These occurred when the power balance constraint was relaxed because load exceeded available generation. The CAISO validated that their software was working appropriately during these instances.
- **Valid over-supply infeasibility** (power balance constraint excess). These occurred when the power balance constraint was relaxed because generation exceeded load. The CAISO validated that their software was working appropriately during these instances.
- **Load conformance limiter would have resolved infeasibility.** The load conformance limiter automatically reduces the size of an operator load adjustment and sets prices at the last economic signal when the conditions for the limiter are met.[6] During the transition period, the limiter does not change price outcomes because transition period pricing is applied during these intervals instead. However, in these cases, the load conformance limiter *would have resolved the infeasibility* had transition period pricing not been in effect.
- **Correctable infeasibility.** These occurred when the CAISO software relaxed the power balance constraint concurrent with a software error or data error that resulted in a price correction or would have triggered a price correction if transition period pricing were not active.[7]

Figure 1.4 and Figure 1.5 show the monthly frequency of under-supply and over-supply infeasibilities, respectively, in the 15-minute and 5-minute markets. In July, there was 1 valid under-supply infeasibility in the 15-minute market and 2 in the 5-minute market. There was 1 valid over-supply infeasibilities in the 5-minute market and none in the 15-minute market.

[4] When transition period pricing provisions are triggered by relaxation of the power balance constraint, any shadow price associated with the flexible ramping product is set to $0/MWh to allow the market software to use the last economic bid dispatched.

[5] The penalty parameter while relaxing the constraint for shortages may rise from $1,000/MWh to $2,000/MWh, depending on system conditions, per phase 2 implementation of FERC Order 831

[6] The CAISO implemented an enhancement to the load conformance limiter, effective February 27, 2019. With the enhancement, the load conformance limiter triggers by a measure based on the change in load adjustment from one interval to the next, rather than the total level of load adjustment.

[7] Section 35 of the CAISO tariff provides the CAISO authority to correct prices if it detects an invalid market solution or issues due to a data input failure, occurrence of hardware or software failure, or a result that is inconsistent with the CAISO tariff. During erroneous intervals, the CAISO determined that prices resulting under transition period pricing were equivalent to prices that would result from a price correction, so no further price adjustment was appropriate. http://www.caiso.com/Documents/Section35_MarketValidationAndPriceCorrection_May1_2014.pdf

Additionally, there were no intervals in July when the load conformance limiter would have triggered for the TPWR balancing authority area had transition period pricing not been in effect.

Figure 1.4 Frequency of under-supply power balance infeasibilities by month Tacoma Power

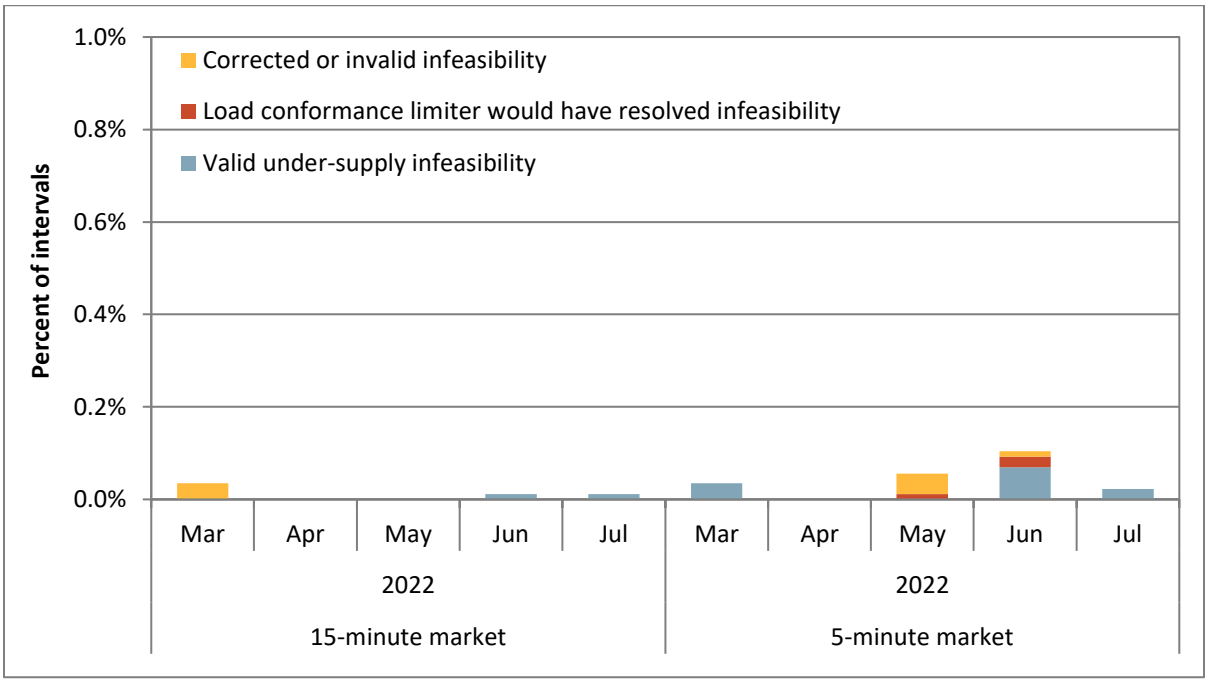


Figure 1.5 Frequency of over-supply power balance infeasibilities by month Tacoma Power

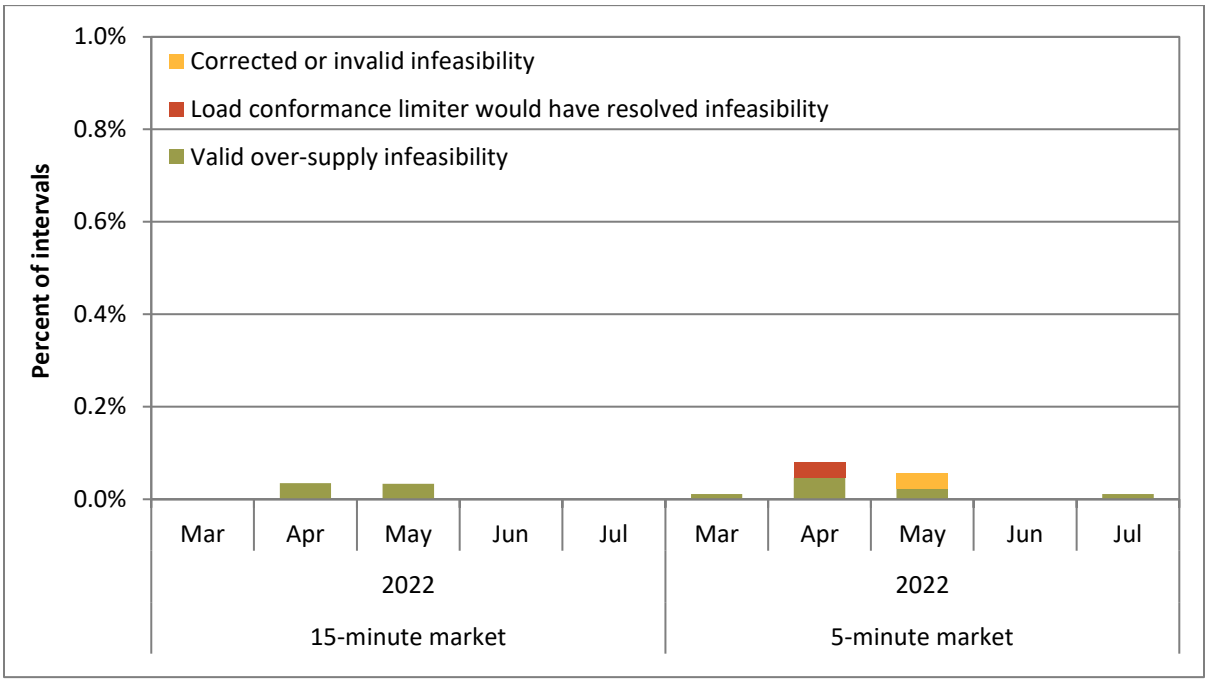


Figure 1.6 and Figure 1.7 show the average monthly prices in the 15-minute and 5-minute markets *with* and *without* the special transition period pricing provisions applied to mitigate prices in the TPWR area during the month.[8] On average for July, transition period pricing decreased TPWR area prices in the 15-minute and 5-minute markets by $0.25/MWh and $0.16/MWh, respectively.

[8] A detailed description of the methodology used to calculate these counterfactual prices that would result without transition period pricing was provided on p. 7 of the January 2017 report for Arizona Public Service from DMM: http://www.caiso.com/Documents/May1_2017_Department_MarketMonitoring_EIMTransitionPeriodReport_ArizonaPublicService_Jan2017_ER15-2565.pdf

Figure 1.6 Average prices by month – Tacoma Power (TPWR) (15-minute market)

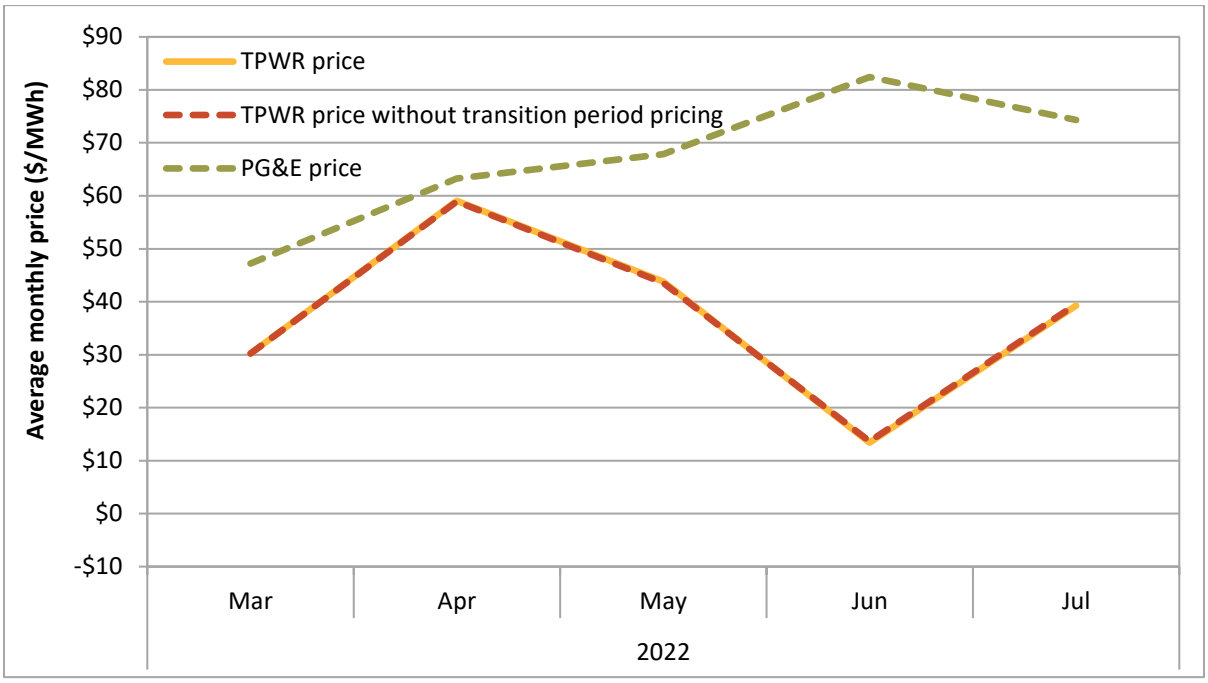
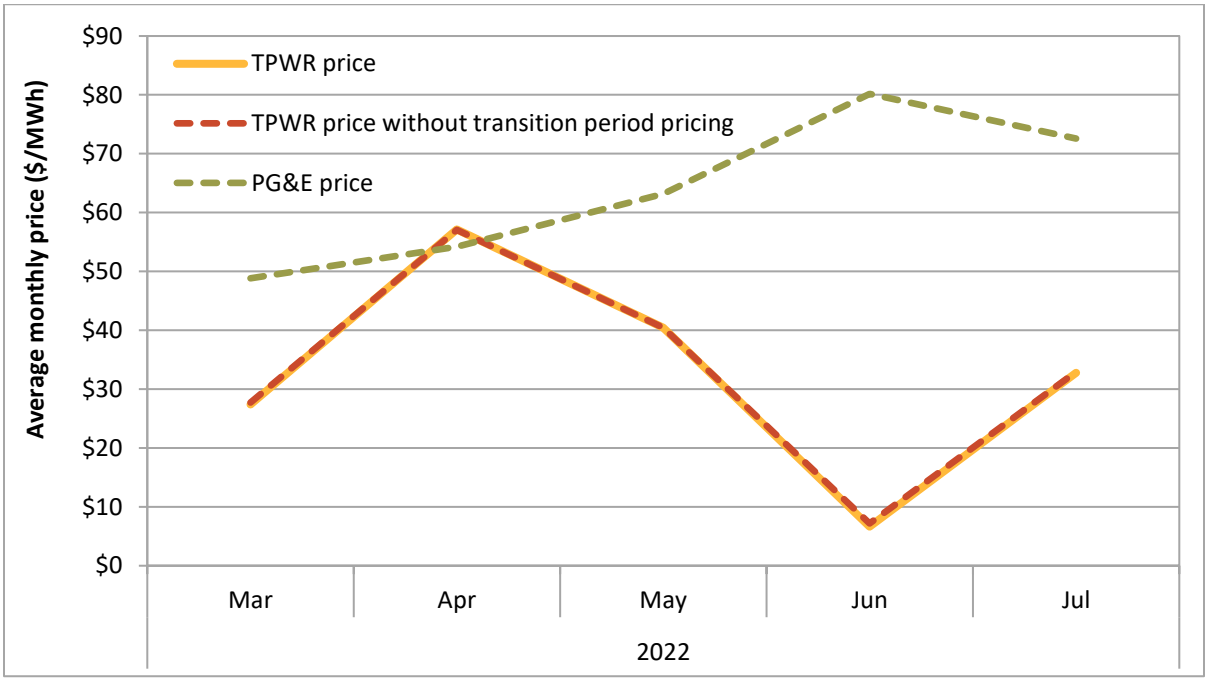


Figure 1.7 Average prices by month – Tacoma Power (TPWR) (5-minute market)



2 Flexible ramping sufficiency and bid range capacity tests

As part of the Western Energy Imbalance Market, each area, including the California ISO, is subject to a resource sufficiency evaluation. The evaluation is performed prior to each hour to ensure that generation in each area is sufficient without relying on transfers from other balancing areas. The evaluation includes two tests:

- **The bid range capacity test (capacity test)** requires that each area provide incremental bid-in capacity to meet the imbalance between load, intertie, and generation base schedules.
- **The flexible ramping sufficiency test (sufficiency test)** requires that each balancing area has enough ramping flexibility over an hour to meet the forecasted change in demand as well as uncertainty.

If an area fails either the bid range capacity test or flexible ramping sufficiency test, WEIM transfers into that area cannot be increased.[9] Failures of the capacity and sufficiency test are important because these outcomes limit transfer capability. Constraining transfer capability may affect the efficiency of the WEIM by limiting transfers into and out of a balancing area that could potentially provide benefits to other balancing areas. Reduced transfer capability also affects the ability for an area to balance load, since there is less availability to import-from or export-to neighboring areas. This can result in local prices being set at power balance constraint penalty parameters.

Figure 2.1 shows the monthly frequency of upward and downward flexible ramping sufficiency test failures, while Figure 2.2 shows the number of bid range capacity test failures by month. The TPWR balancing authority area failed the upward and downward sufficiency tests during 1 interval and 14 intervals, respectively. TPWR the upward and downward capacity tests during 1 interval and 19 intervals, respectively.

[9] If an area fails either test in the upward direction, net WEIM imports (negative) during the hour cannot exceed the lower of either the base transfer or optimal transfer from the last 15-minute interval prior to the hour.

Figure 2.1 Frequency of upward and downward sufficiency test failures by month Tacoma Power (TPWR)

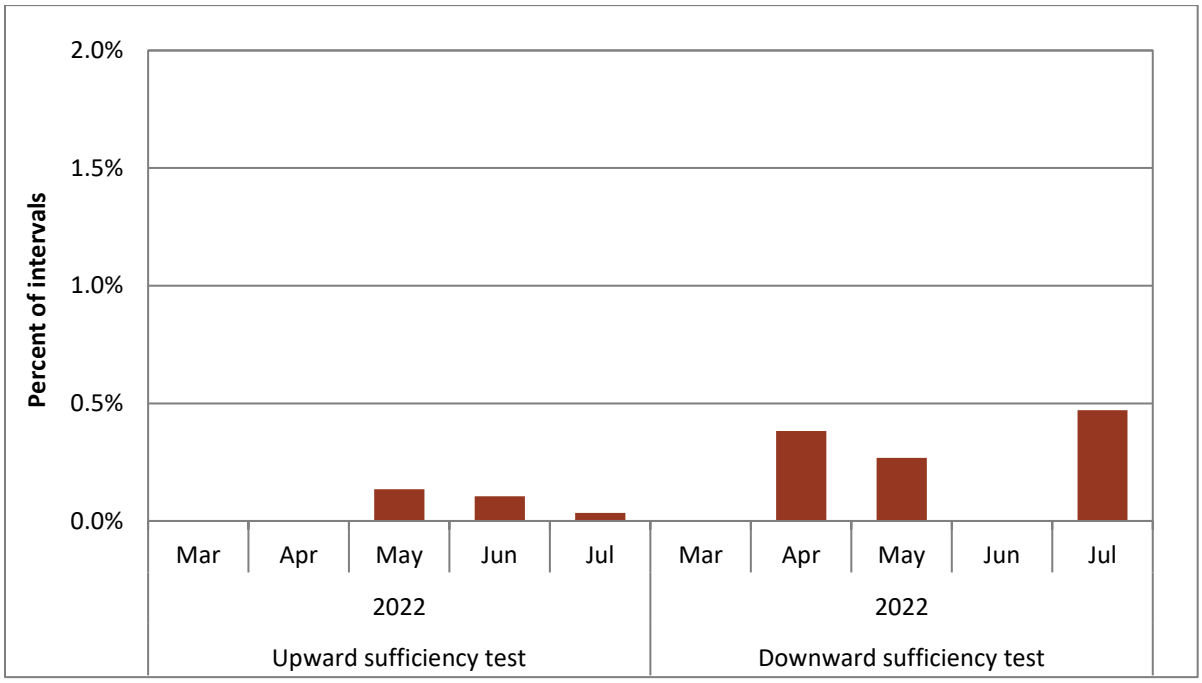
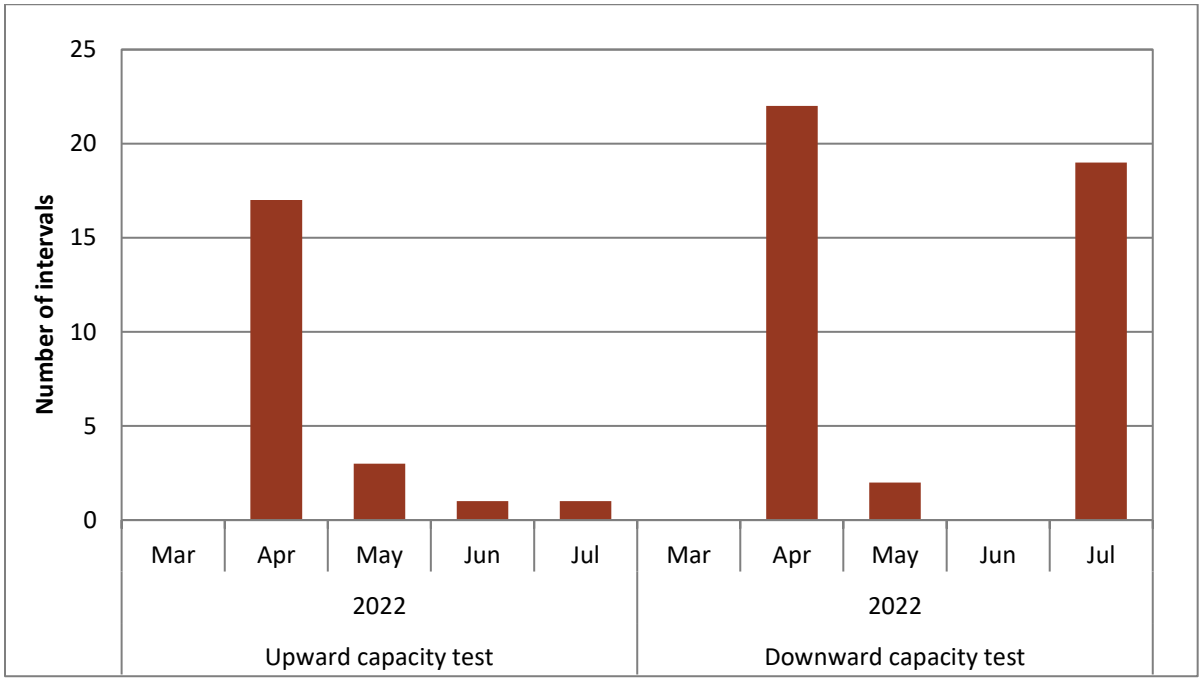


Figure 2.2 Frequency of upward and downward capacity test failures by month Tacoma Power (TPWR)



CERTIFICATE OF SERVICE

I certify that I have served the foregoing document upon the parties listed on the official service list in the captioned proceedings, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, California, this 9th day of September, 2022.

/s/ Jennifer Shirk

Jennifer Shirk