

December 4, 2018

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-_____**
**Energy Imbalance Market Special Report – Transition Period –
July 2018 for Powerex Corp.**

Dear Secretary Bose:

The Department of Market Monitoring (DMM) hereby submits its Energy Imbalance Market (EIM) special report on the transition period of Powerex Corp. (PWRX) during its first six months of participation in the EIM for July 2018. PWRX entered the EIM on April 4, 2018.

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

Respectfully submitted,

By: /s/ Eric Hildebrandt

Eric Hildebrandt
Director of Market Monitoring
California Independent System
Operator Corporation
250 Outcropping Way
Folsom, CA 95630
Tel: (916) 608-7123
Fax: (916) 608-7222
ehildebrandt@caiso.com

California ISO

Report on energy imbalance market issues and performance: Powerex for July 2018

December 4, 2018

Prepared by: Department of Market Monitoring

Executive summary

Pursuant to the Commission's October 29, 2015 Order on the ISO's energy imbalance market (EIM), the ISO filed a report on September 14, 2018 covering the period from July 1 through July 31, 2018 (July report) for the Powerex area in the energy imbalance market.¹ This report provides a review by the Department of Market Monitoring (DMM) of energy imbalance market performance in the Powerex area during the period covered in the ISO's July report. Key findings in this report include the following:

- Real-time prices in Powerex differed from ISO prices largely because of congestion on transmission to the ISO. Prices for Powerex averaged about \$27/MWh in the 15-minute market and \$28/MWh in the 5-minute markets.
- Powerex failed the upward sufficiency test during just 1 hour and the downward sufficiency test during a total of 9 hours.
- There were no valid power balance constraint infeasibilities in Powerex for under-supply in either the 15-minute or 5-minute markets for Powerex. However, there were 8 intervals in the 5-minute market and 4 intervals in the 15-minute market with an infeasibility for over-supply.
- DMM reviewed the results and conclusions in the ISO's July report and found that the results are largely consistent with those reported in this document. However, the ISO's report does not account for the number of over-supply infeasibilities.

Section 1 of this report provides a description of prices and power balance constraint relaxations, section 2 discusses the flexible ramping sufficiency test.

¹ The ISO's July 2018 Report was filed at FERC and posted on the ISO website on September 14, 2018, <http://www.caiso.com/Documents/Sep14-2018-EIMTransitionPeriodReport-PWRX-Jul2018-ER15-2565.pdf>.

1 Energy imbalance market prices

Figure 1.1 and Figure 1.2 show hourly average 15-minute and 5-minute prices during July for Powerex, PacifiCorp West, and Pacific Gas and Electric (PG&E), as well as the bilateral prices DMM used as an additional benchmark for energy imbalance market prices. The bilateral price benchmark for Powerex is composed of energy prices at the Mid-Columbia hub published by ICE.

Prices in Powerex were mostly lower than prices in the ISO because of limited transmission to the ISO. This resulted in local resources setting the price in a combined Powerex, Portland General Electric, Puget Sound Energy and PacifiCorp West region during many intervals, instead of prices reflecting the overall system price. In the Powerex area, prices averaged about \$27/MWh in the 15-minute market and \$28/MWh in the 5-minute markets during the month of July. During the majority of intervals in July, real-time prices in Powerex and PacifiCorp West were similar.

Figure 1.1 Average hourly 15-minute price (July 2018)

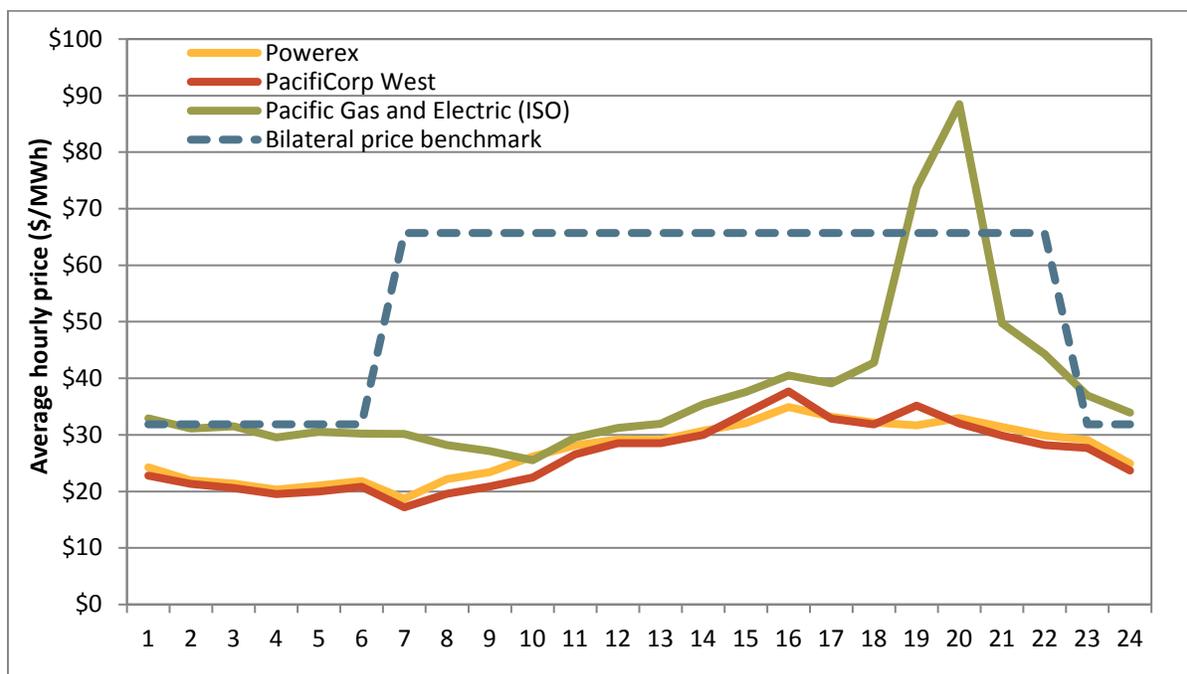
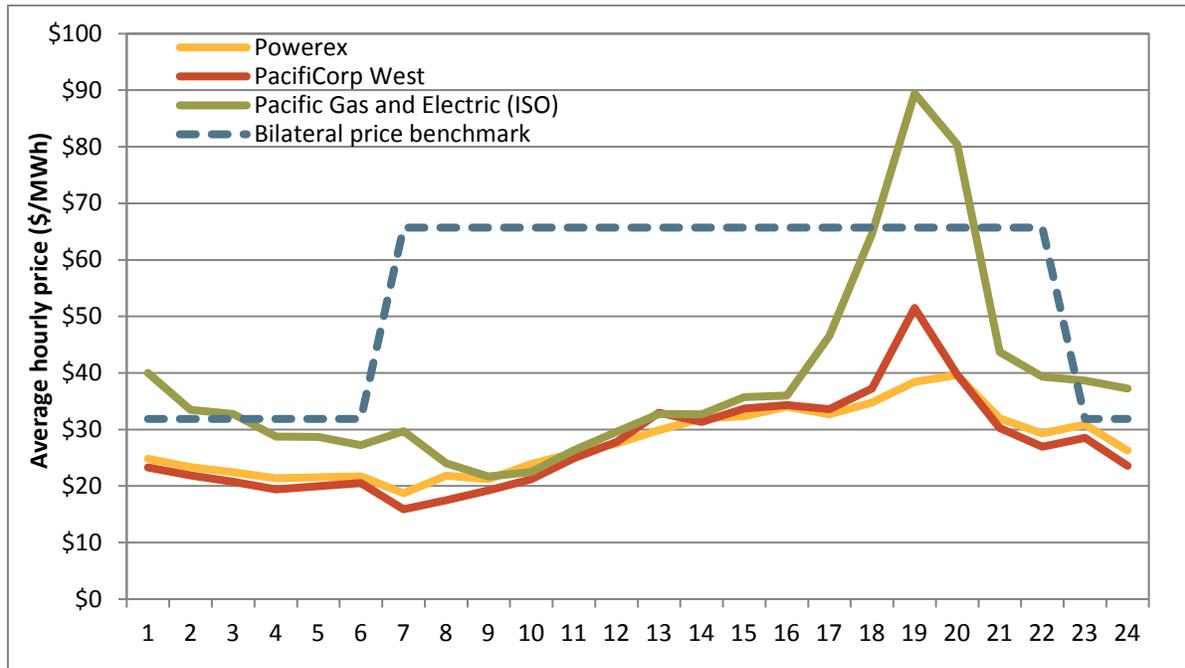


Figure 1.2 Average hourly 5-minute price (July 2018)

All power balance constraint relaxations that occurred in July are subject to the six-month transition period pricing that expires in October 2018. 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.² During July, there were no valid power balance constraint infeasibilities for under-supply in either the 15-minute or 5-minute markets for Powerex. However, there were 8 intervals in the 5-minute market and 4 intervals in the 15-minute market with an infeasibility for over-supply. These infeasibilities occurred during a single hour after failing the downward sufficiency test.

Figure 1.5 and Figure 1.6 show the average weekly prices in the 15-minute market and 5-minute market *with* and *without* the special transition period pricing provisions applied to mitigate prices.³ These figures also include the average bilateral price benchmark for comparison to Powerex prices, depicted by the dashed blue lines. On average for the month, transition period pricing increased prices marginally by \$0.16 in the 15-minute market and \$0.11 in the 5-minute market due to valid over-supply infeasibilities.

² 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.

³ 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: <https://records.oe.caiso.com/sites/GCA/legal/mm/Records/EIM/FERC%20Report/2017-01%20Arizona/EIM%20Special%20Report%20January%20APS.pdf>.

Figure 1.3 Average prices by month – Powerex (15-minute market)

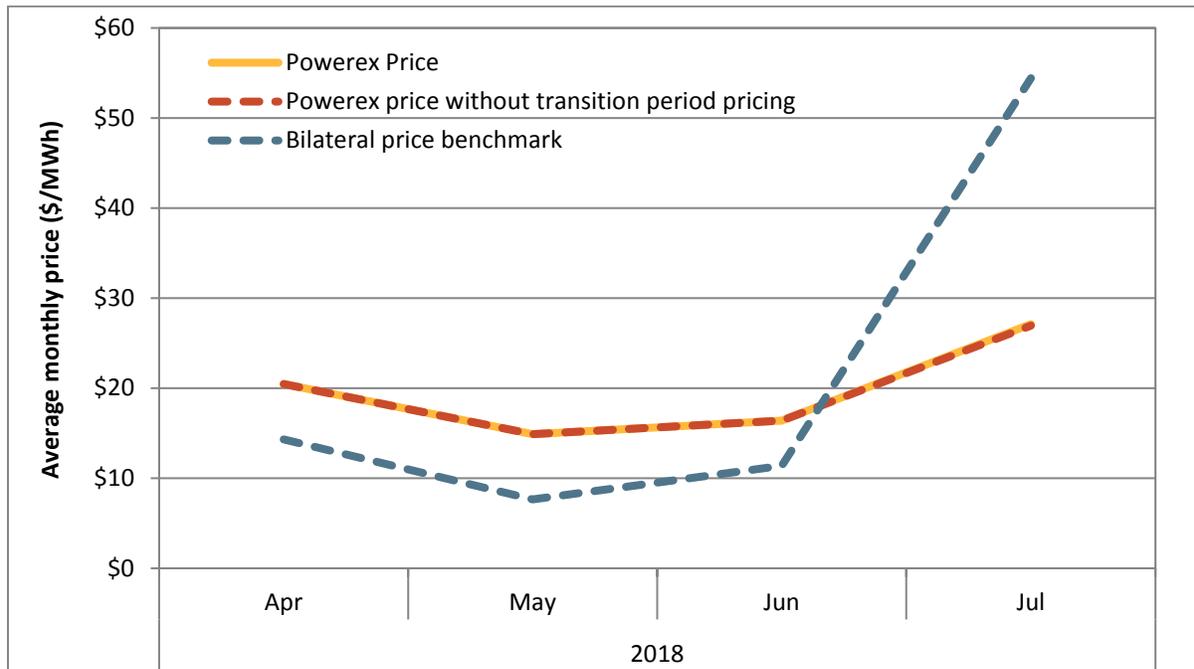
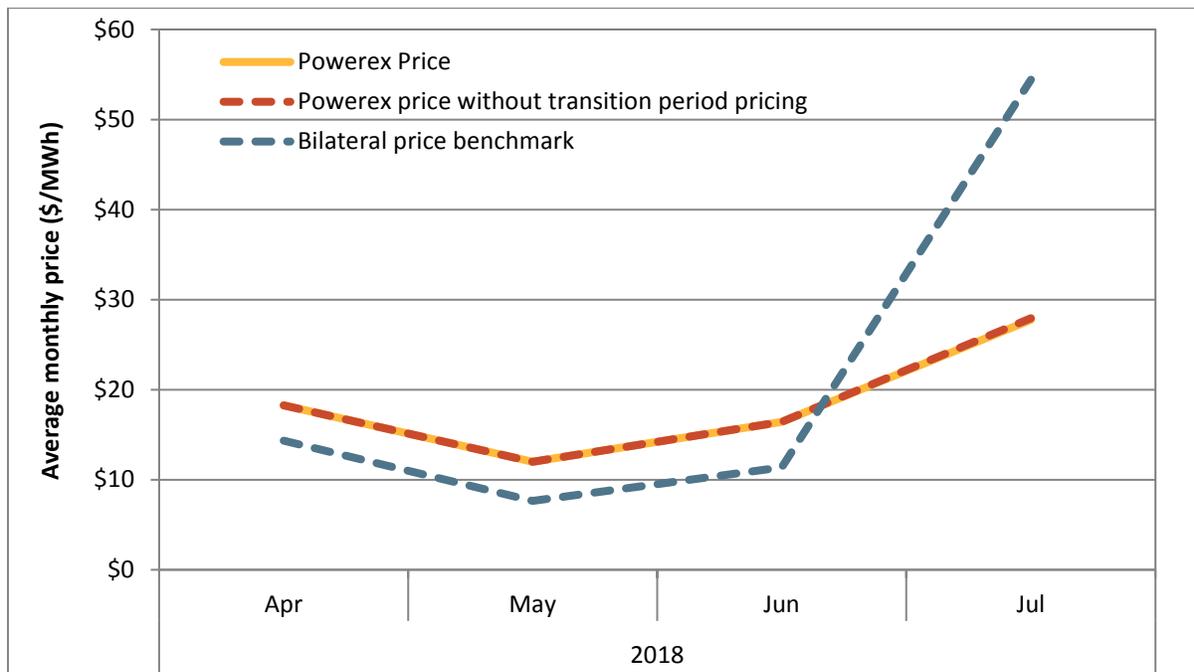


Figure 1.4 Average prices by month – Powerex (5-minute market)



2 Flexible ramping sufficiency test

The flexible ramping sufficiency test ensures that each balancing area has enough ramping resources over each hour to meet expected upward and downward ramping needs. The test is designed to ensure that each energy imbalance market area has sufficient ramping capacity to meet real-time market requirements without relying on transfers from other balancing areas.

When the energy imbalance market was initially implemented there was an upward ramping sufficiency test. In November 2016, the ISO implemented an additional downward ramping sufficiency test in the market with the introduction of the flexible ramping product, which replaced the flexible ramping constraint. If an area fails the upward sufficiency test, energy imbalance market imports cannot be increased.⁴ Similarly, if an area fails the downward sufficiency test, exports cannot be increased. In addition to the sufficiency test, each area is also subject to a capacity test. If an area fails the capacity test, then the flexible ramping sufficiency test automatically fails as a result.⁵

Limiting transfers can impact the frequency of power balance constraint relaxations and, thus, price separation across balancing areas. Constraining transfer capability may also impact the efficiency of the energy imbalance market by limiting transfers into and out of a balancing area that could potentially provide benefits to other balancing areas.

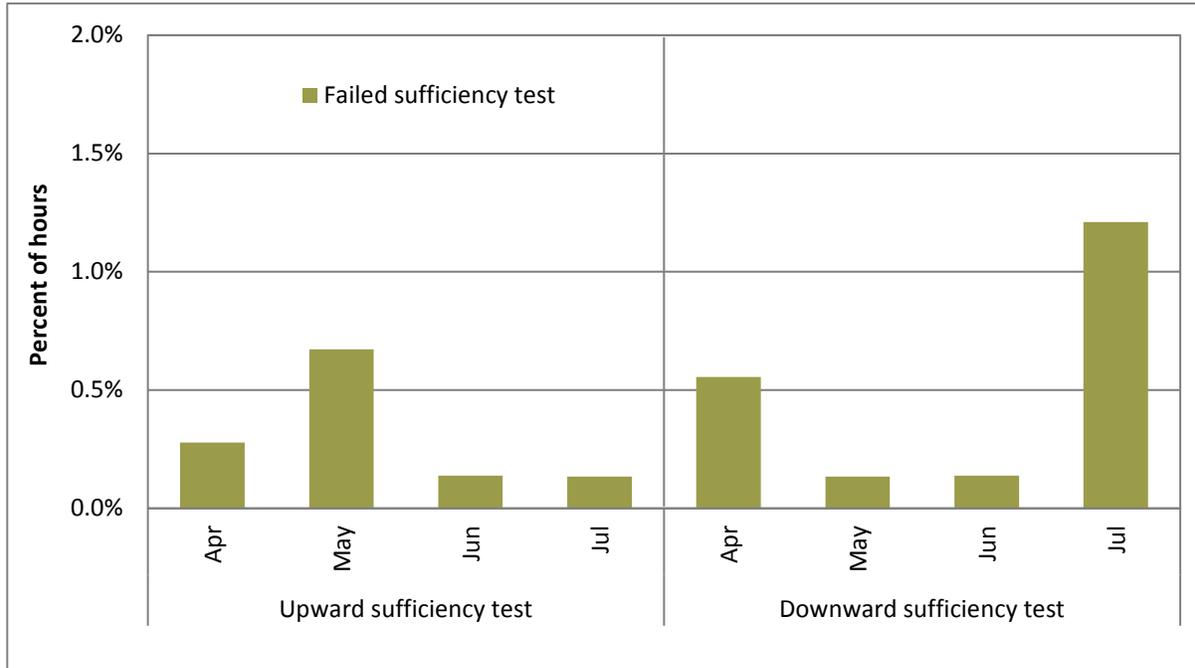
Figure 3.1 shows the frequency that Powerex failed the sufficiency test in the upward or downward direction. As shown in Figure 3.1, Powerex failed the upward sufficiency during only 1 hour in the month of July. In the downwards direction, they failed the sufficiency test more frequently during a total of 9 hours.

⁴ *Business Practice Manual for the Energy Imbalance Market*, August 30, 2016, p. 45-52:

https://bpmcm.caiso.com/BPM%20Document%20Library/Energy%20Imbalance%20Market/BPM_for_Energy%20Imbalance%20Market_V6_clean.docx.

⁵ *Business Practice Manual for the Energy Imbalance Market*, August 30, 2016, p. 45.

Figure 3.1 Powerex flexible ramping sufficiency test results



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, on this 4th day of December, 2018.

Is/ Anna Pascuzzo
Anna Pascuzzo