

August 20, 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 –
April 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 April 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 April 2018

August 16, 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 June 13, 2018 covering the period from April 4 through April 30, 2018 (April report) for the Powerex entity in the energy imbalance market.¹ This report provides a review by the Department of Market Monitoring (DMM) of energy imbalance market performance for the Powerex entity during the period covered in the ISO's April 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 \$20/MWh and \$18/MWh in the 15-minute and 5-minute markets, respectively.
- Powerex failed the sufficiency test in either direction infrequently, during 4 hours in the downward direction and just 2 hours in the upward direction.
- There were no power balance constraint infeasibilities for under-supply or over-supply conditions in either the 15-minute or 5-minute markets during April for Powerex.
- DMM reviewed the results and conclusions in the ISO's April report and found that the results are consistent with those reported in this document.

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 April 2018 Report was filed at FERC and posted on the ISO website on June 13, 2018, http://www.caiso.com/Documents/Jun13_2018_EIMTransitionPeriodReport_PowerexCanadianEIMEntity_Apr2018_ER15-2565.pdf.

1 Energy imbalance market prices

Figure 1.1 and Figure 1.2 show hourly average 15-minute and 5-minute market prices during April 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.

On average, prices in the Powerex area were significantly lower than prices in the ISO during peak load hours and higher than prices in the ISO during midday hours. This is because of limited import and export transfer capability with the ISO. Powerex prices tracked closer to prices in PacifiCorp West during peak load hours, rather than the overall system price. In the Powerex area during the month, prices averaged about \$20/MWh and \$18/MWh in the 15-minute and 5-minute markets, respectively. In comparison, prices in PacifiCorp West average about \$17 and \$19 in the 15-minute and 5-minute markets.

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

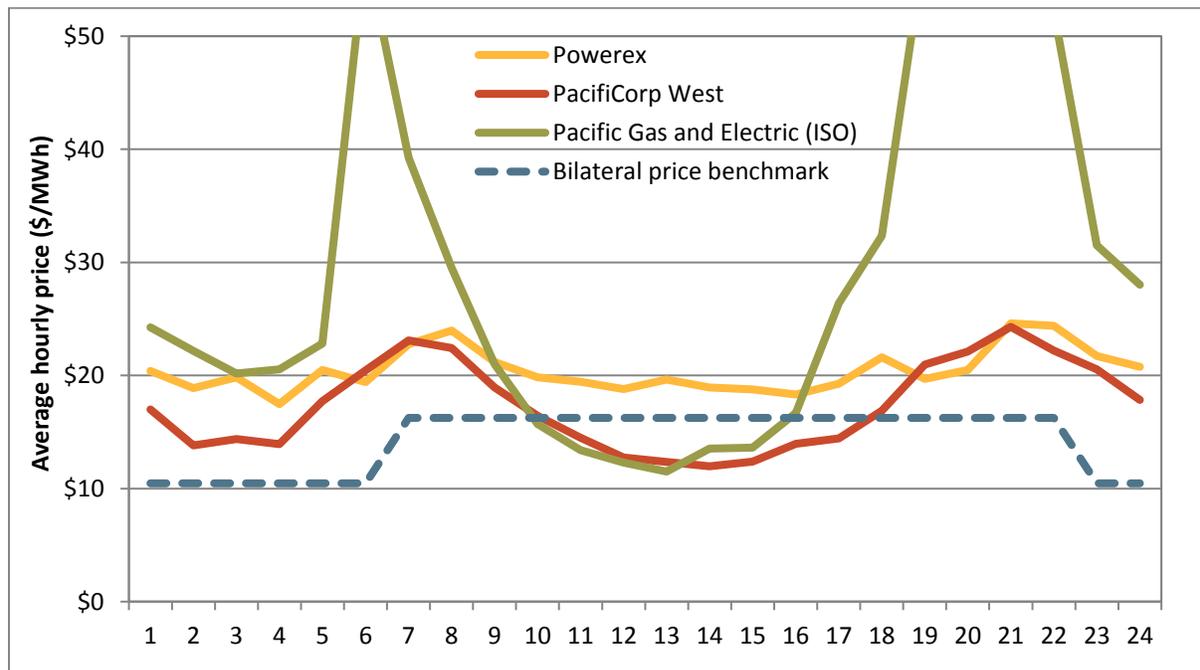
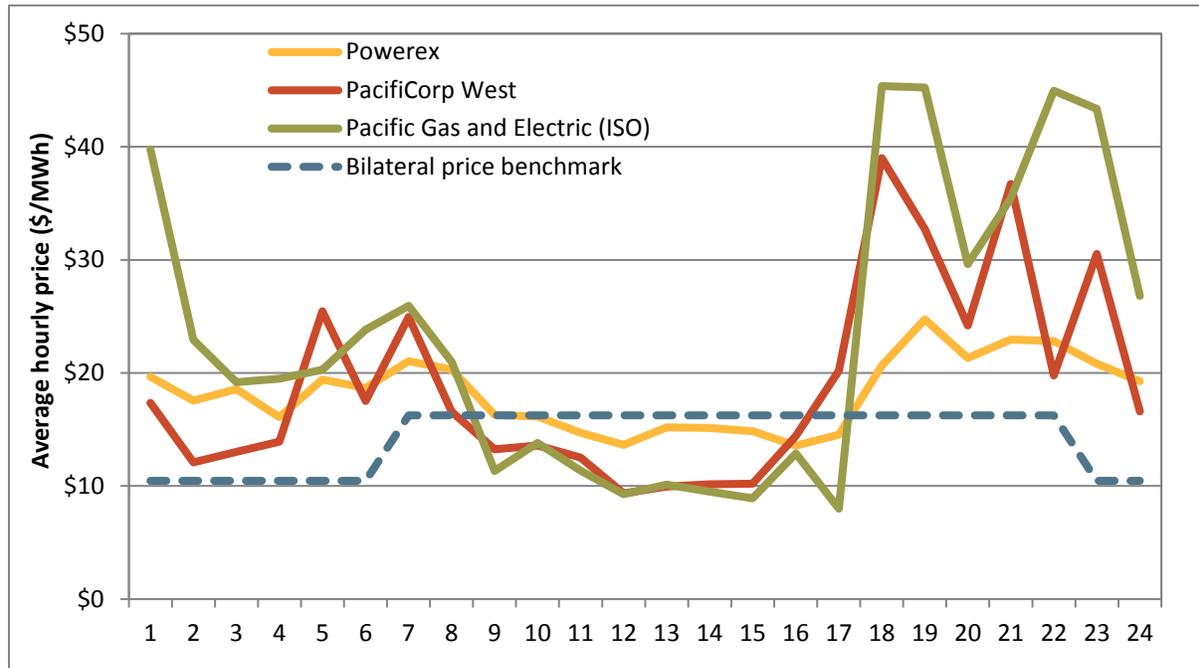


Figure 1.2 Average hourly 5-minute price (April 2018)

All power balance constraint relaxations that would have occurred in April would have been 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 However, there were no power balance constraint infeasibilities for under-supply or over-supply conditions in either the 15-minute or 5-minute markets during April for Powerex.

Figure 1.3 and Figure 1.4 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. There were no power balance constraint relaxations during April for Powerex, so prices with and without special transition period pricing provisions were identical.

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 week – Powerex (15-minute market)

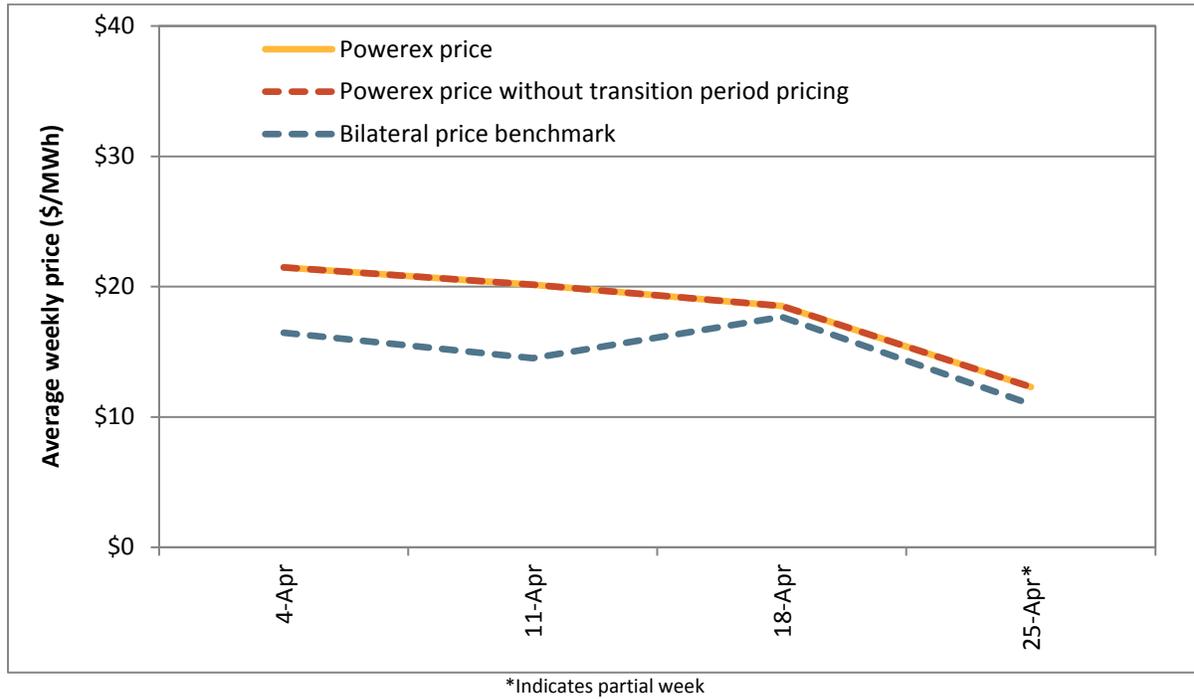
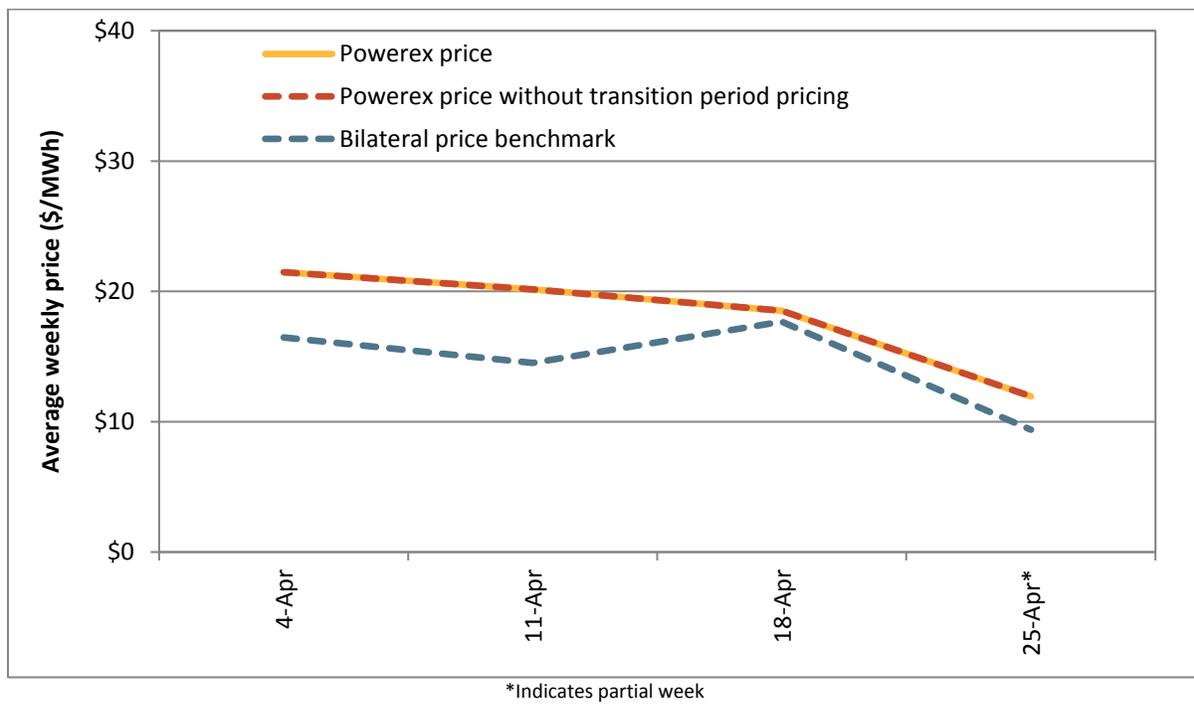


Figure 1.4 Average prices by week – Powerex (5-minute market)



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

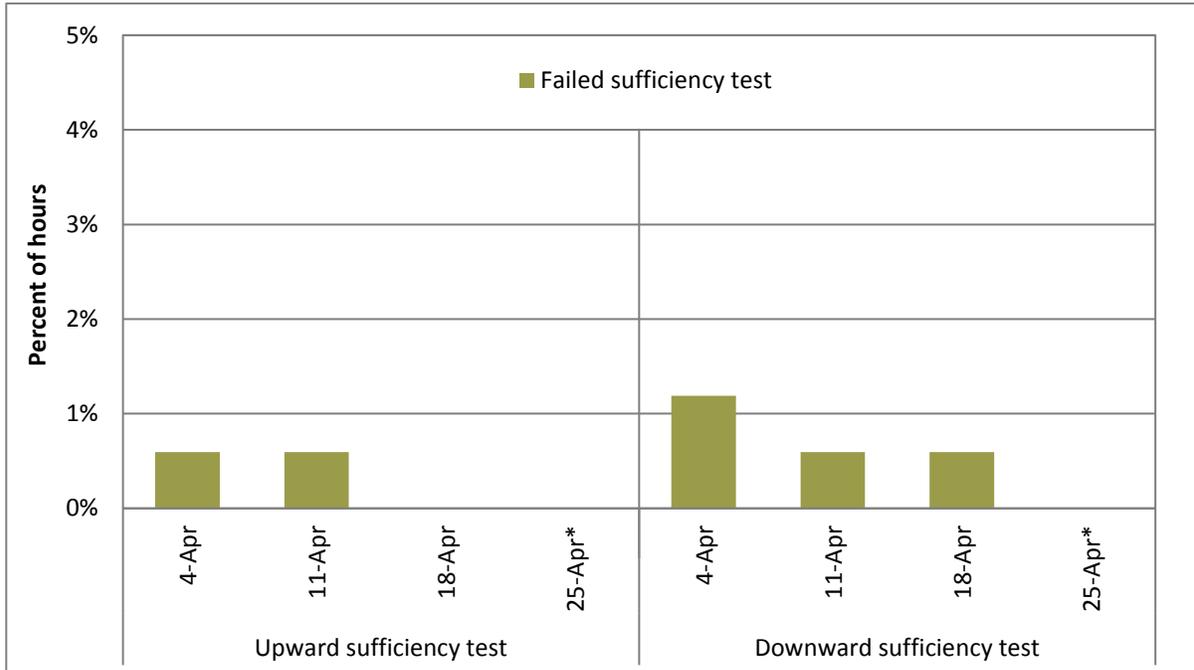
Limiting transfers can impact the frequency of power balance constraint relaxations and, thus, price separation across balancing areas. Constraining transfer capability may also impact the efficiency of the energy imbalance market by limiting transfers into and out of a balancing area that could potentially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

Figure 2.1 shows the frequency that Powerex failed the sufficiency test in the upward or downward direction. As shown in Figure 2.1, Powerex failed the sufficiency test in either direction infrequently, during 4 hours in the downward direction and just 2 hours in the upward direction.

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 2.1 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 20th day of August, 2018.

/s/ Grace Clark
Grace Clark