Memorandum

To: ISO Board of Governors

From: Eric Hildebrandt, Executive Director, Market Monitoring

Date: December 5, 2018

Re: **Department of Market Monitoring update**

This memorandum does not require Board action.

EXECUTIVE SUMMARY

This memo provides highlights of market performance in October and November.

- Energy prices in October were comparable to the same month last year, despite a notable increase in gas prices. Prices in November increased in both day-ahead and real-time markets compared to 2017, driven primarily by relatively high gas prices, along with lower hydro generation.
- Prices in the day-ahead market remained higher then real-time prices, continuing a trend that has persisted during most months since June 2017.
- The impact of congestion shifted dramatically in October and November, changing from a pattern of north-to-south congestion to congestion in the south-to-north direction. The change in congestion is driven in part by outages constraining transmission between north and south. Gas prices in the south continued to exceed gas prices in the north, but the premium was less than the average monthly difference in July and August.
- Bid cost recovery payments through November totaled about $156 million, the highest value for any year since 2011. High bid cost recovery payments were driven by high gas prices, along with actions taken by grid operators due to system conditions, particularly during the summer months.
- Congestion revenue rights auction revenues were $120 million less than payments made in 2018 to non-load-serving entities purchasing these rights, excluding payments to be made in December. This value already exceeds the $101 million in losses incurred in 2017 and will increase when December payments are included.

ENERGY MARKET PERFORMANCE

Preliminary values reported in this memo exclude price corrections and other adjustments not yet reflected in settlements. A discussion of trends apparent in the third quarter are included in the recent quarterly *Report on Market Issues and Performance*.[1]

Energy market prices

As shown in Figure 1, energy prices in November increased relative to the same month in 2017. Prices in Q3 (July – September) increased significantly compared to the same quarter in 2017, particularly in the day-ahead market. Both increases in prices were driven by a combination of factors, including high gas prices and reduced hydro generation.

As shown in Figure 2, on an average hourly basis, prices continue to follow the net load curve in all markets, peaking in hour ending 19. Prices in the day-ahead market remained higher then real-time prices most hours of the day.

Gas prices

Prices at SoCal Citygate were extremely high on some days in July and August of 2018 due to increased natural gas demand amid high temperatures, combined with unplanned pipeline maintenance, restricted storage activity at Aliso Canyon and anticipation of potential low operational flow order non-compliance penalty charges.

Gas prices continued to be high, relative to Henry Hub, through October and November. SoCal Citygate gas prices often impact overall system energy prices for two reasons: there are large numbers of natural gas resources in the south, and there is often greater congestion in the south that creates load pockets.

Renewable generation

Total generation from hydroelectric resources was about 43 percent lower in November of 2018 than the same month in the prior year, as shown in Figure 3. Wind and solar production increased 2 and 12 percent respectively. As in prior periods, decreased availability of hydroelectric, wind and solar resources is correlated with relatively high prices because, when available, these resources often submit bids reflecting their relatively low marginal costs.

[1] http://www.caiso.com/Documents/2018ThirdQuarterReportonMarketIssuesandPerformance.pdf

Figure 1. Average monthly system marginal energy price (all hours) and SoCal Citygate price ($/MMBtu)

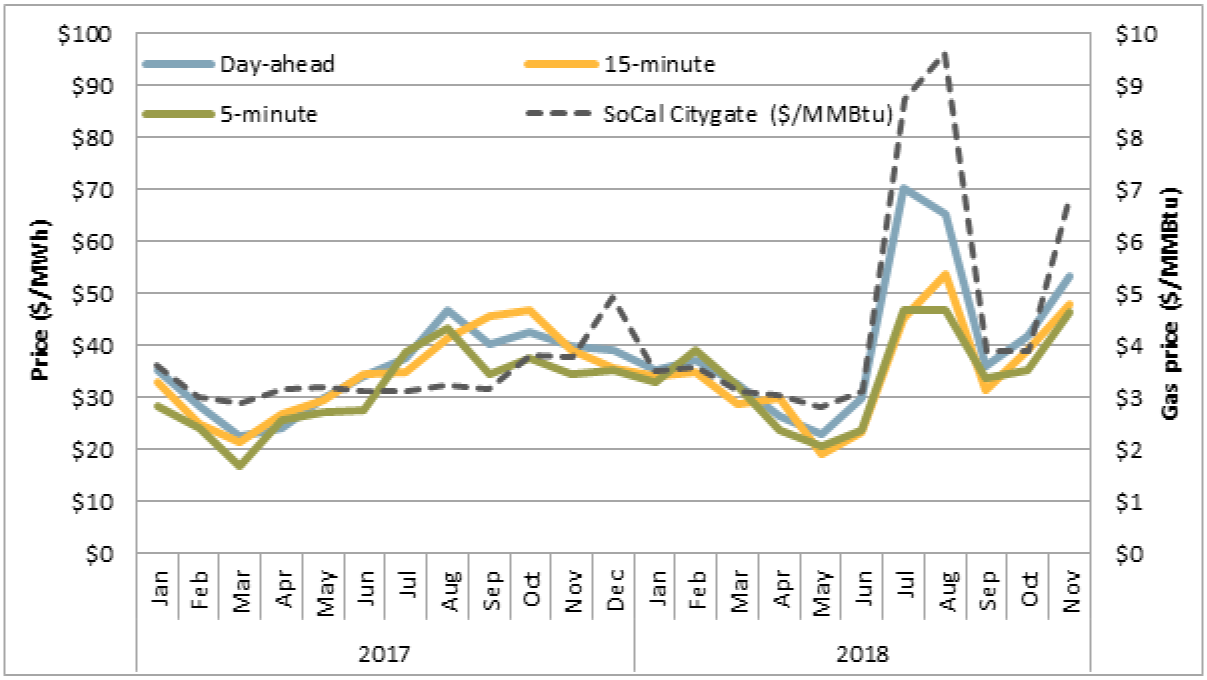


Figure 2. Average hourly system marginal energy price, October and November 2018

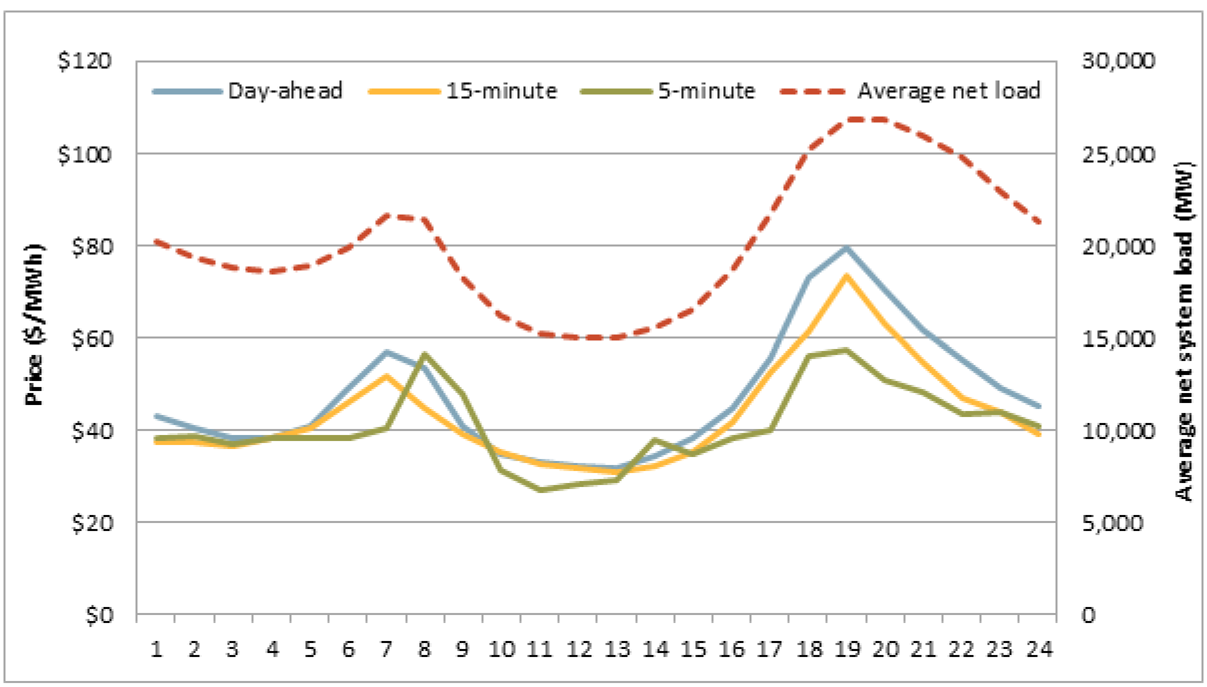
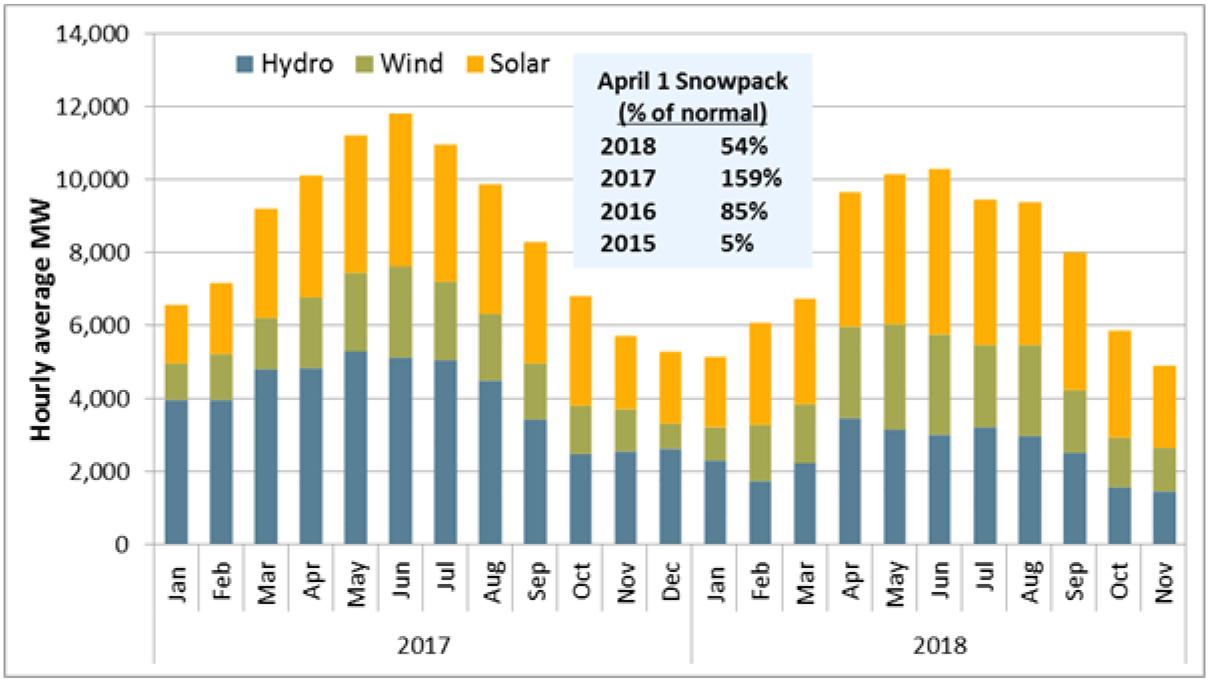


Figure 3. Average hourly hydroelectric, wind and solar energy by month



Congestion

The impact of congestion shifted dramatically in October and November. In October and November, transmission outages decreased prices in the Southern California Edison and San Diego Gas and Electric and increased PG&E prices (see Figures 4 and 5). Although gas prices in the south continued to exceed gas prices in the north, the premium was less than the average monthly difference in July and August.

In the third quarter, there was significant north-to-south congestion in both the day-ahead market and 15-minute markets. North to south congestion in the third quarter was consistent with high system load, outages constraining transmission between north and south and consistent differences in natural gas prices, which were much higher in the south.

Figure 4. Impact of congestion on day-ahead prices

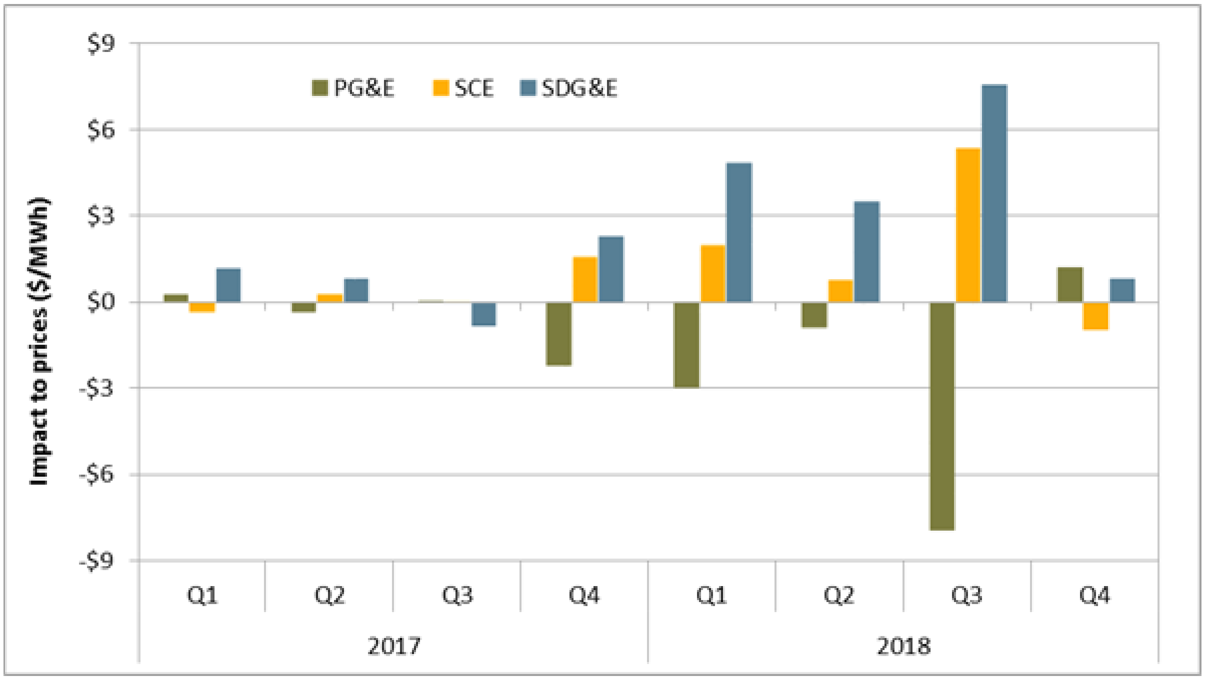
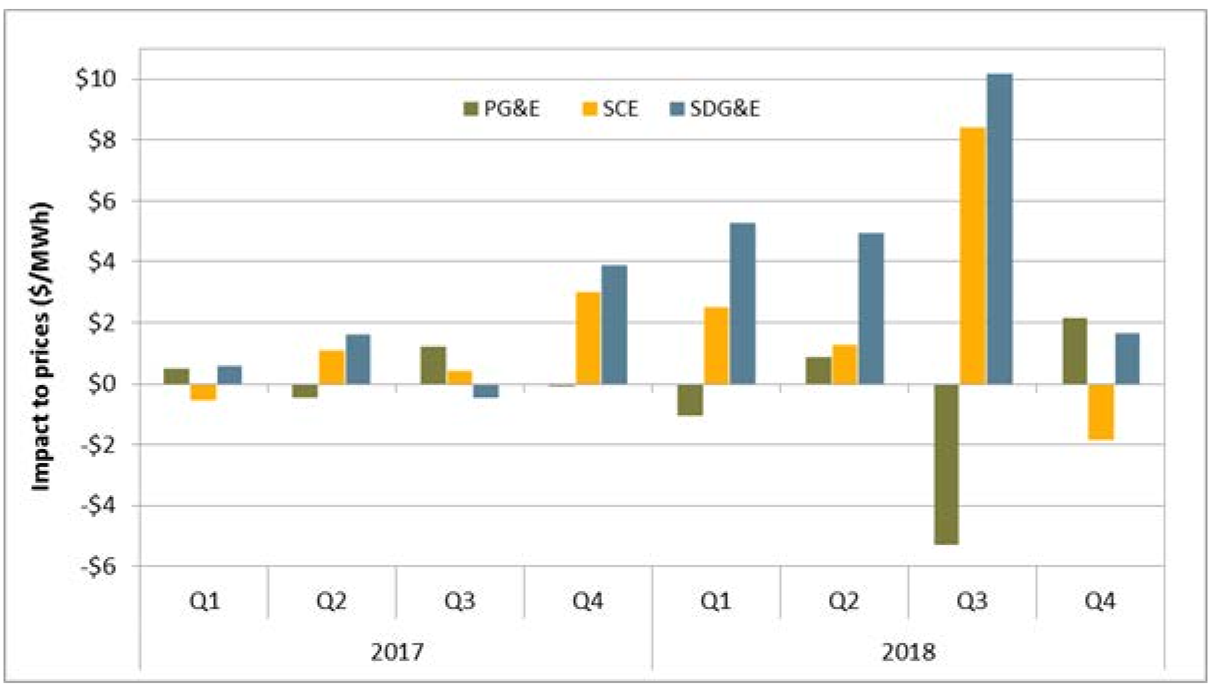


Figure 5. Impact of congestion on 15-minute prices

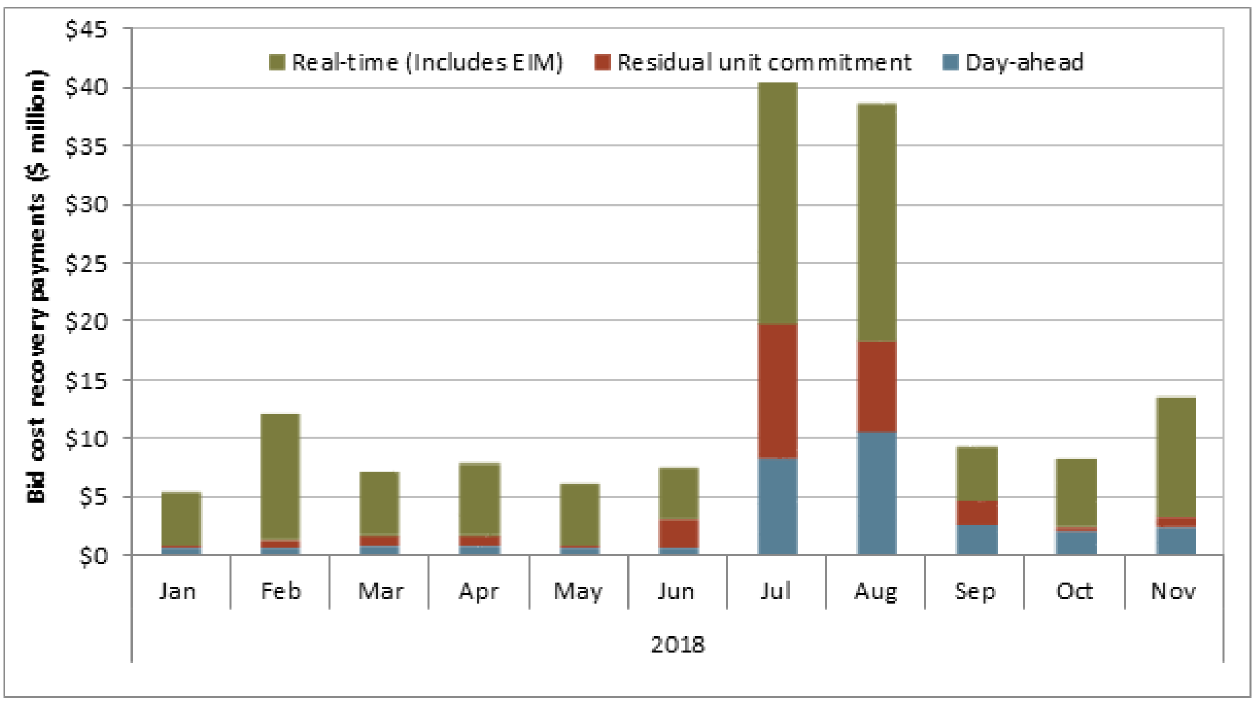


Bid cost recovery payments

Year to date bid cost recovery payments totaled about $156 million, the highest value for any year since 2011. November values are within the price corrections window and are thus subject to change. Bid cost recovery payments for the third quarter of 2018 totaled about $88 million, the highest cost of any quarter since 2011. As shown in Figure 6, this amount was substantially higher than the total amount of bid cost recovery in the previous quarter and in the third quarter of 2017, which were about $21 million and $30 million, respectively.

Year to date bid cost recovery payments for residual unit commitment totaled about $28 million, compared to $13 million in 2017. The significant increase in residual unit commitment bid cost recovery payments in the quarter can be attributed to high volumes of net virtual supply combined with periods of high loads in July and August along with operator adjustments causing the residual unit commitment process to procure more capacity. Payments for real-time, including payments associated with exceptional dispatch, account for the majority of year to date bid cost recovery ($98 million), up from $81 million in 2017.

Figure 6. Monthly bid cost recovery payments



Congestion revenue rights

Through November, revenues from the congestion revenue rights auction were $120 million less than payments made in 2018 to non-load-serving entities purchasing these rights. Auction revenues in Q3 totaled only about 48 percent of payments made to non-load-serving entities purchasing congestion revenue rights in the auction.

These losses already exceed the $101 million in losses from congestion revenue rights incurred in 2017. Year to date values include all 2018 auction revenues, but exclude payments to auctioned rights in December. The total annual ratepayer loss is likely to exceed $120 million.

Figure 7. Auction revenues compared to payments for auctioned CRRs (January 2012 - November 2018)