MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO: Commissioners Helgeson, Brown, Mital, Simpson, and Carlson

FROM: Erin Erben, Chief Customer Officer; Greg Brownell, Portfolio Management Supervisor; Jonathan Hart, Power Trader

DATE: April 21, 2017

SUBJECT: 2017 Power Market and Budget Hedging Update

OBJECTIVE: Information Only

Issue

The purpose of this backgrounder is to provide an annual update of wholesale power markets.

Background

The Pricing and Portfolio Management department, along with Power Operations, manages EWEB power supply and wholesale market activities consistent with utility financial objectives, in accordance with Board Policy contained in SD8, and as further described in the EWEB Energy Risk Management Procedures.

Discussion

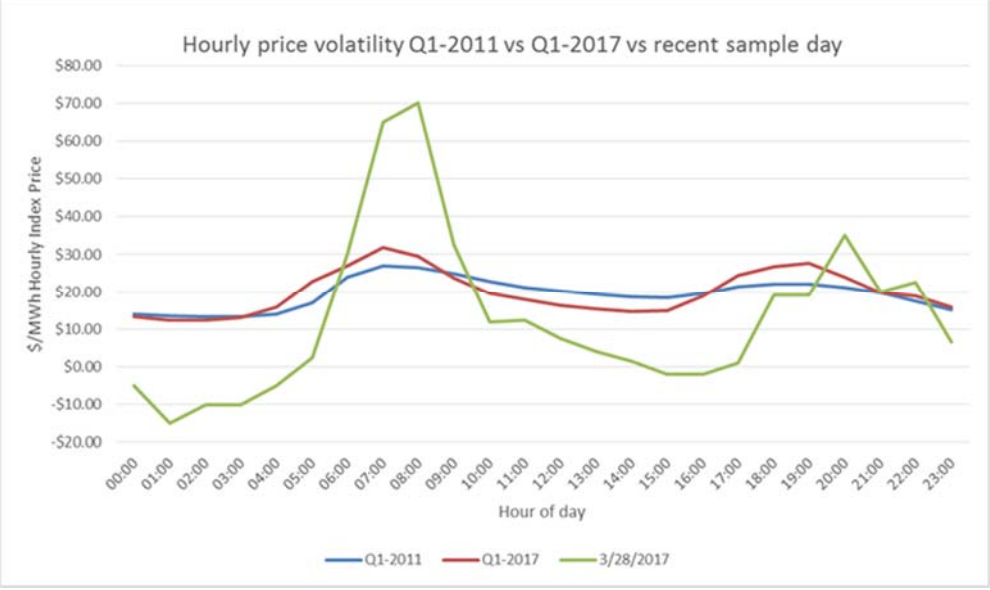
Market Price Update

Wholesale energy markets can generally be described as either near term spot markets or long term forward futures markets. For spot markets, prices are impacted by near term weather (temperature and precipitation) and operational phenomena (generator, transmission), where long term markets are more likely impacted by forecasted structural changes in resource abundance and consumer demand.

For 2017, northwest spot markets price are among the lowest seen in decades. Several factors are contributing to these historic prices. First off, the Columbia River Basin is expected to receive 132% of its normal water supply for the season (Oct-Sep). This ranks the water year 6th out of the last 57 years tracked by NOAA[1]. Secondly, export pricing to California has been soft given the state's remarkable drought recovery[2] and aggressive schedule of renewables development[3]. Finally, natural gas prices remain low and were near 20 year lows in 2016[4]. 2017 natural gas prices are expected to be higher than 2016[5], which could boost energy market values, but overall the region is awash low value energy.

While daily average spot prices are declining, we are starting to see increased volatility in intraday prices. This volatility appears to coincide with increases in California solar build outs which have a tendency to stress system capacity during shoulder periods[6]. This change in diurnal pricing pattern (illustrated below) is now appearing in northwest markets. While the solar build outs push down prices overall they generally yield additional value to flexible resources such Carmen Smith.

Figure 1: Example day of real time price volatility with historical comparators

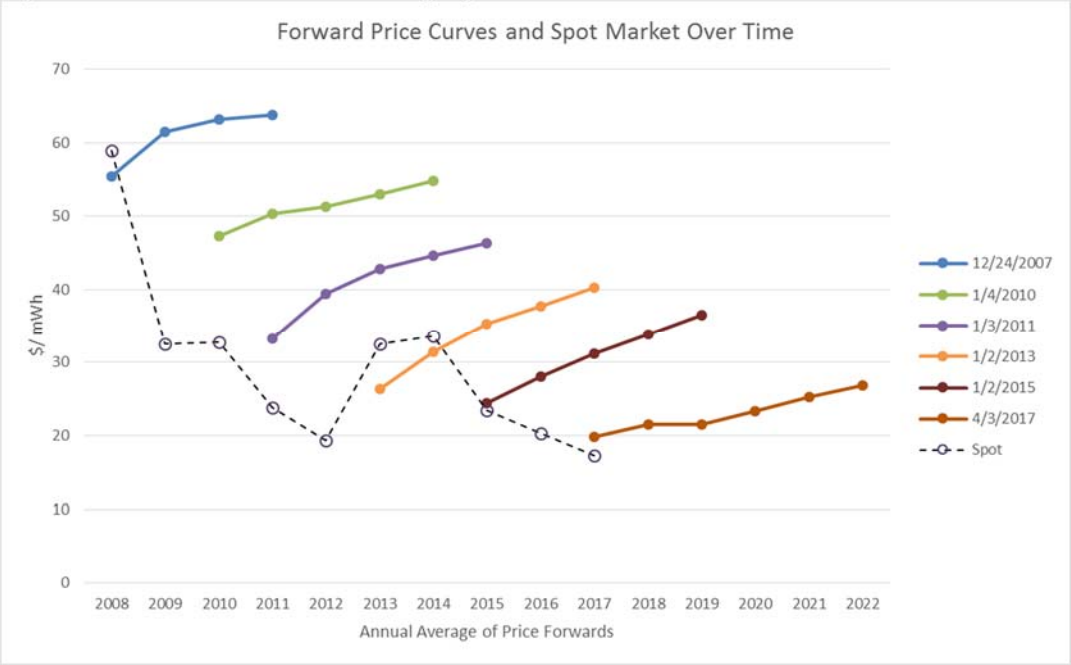


[1] https://www.nwrfc.noaa.gov/water_supply/ws_ranking.cgi?id=TDAO3&per=OCT-SEP
[2] https://www.eia.gov/todayinenergy/detail.php?id=30452
[3] http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf
[4] https://www.eia.gov/todayinenergy/detail.php?id=29552
[5] https://www.eia.gov/todayinenergy/detail.php?id=29632
[6] https://www.eia.gov/todayinenergy/detail.php?id=30692

The trends, noted above, impact the forward northwest energy futures markets, as well as the spot markets previously discussed. The futures markets continue to fall relative to historical periods. This pattern is driven largely by continued expectations for low price natural gas and increases in renewable development (wind/solar) created by the renewable legislations ("RPS").

The chart below shows forward curves over time and spot market prices. A forward curve reflects prices for future periods in tradable markets. The first line reflects forward curve was taken at the end of 2007. Trades executed during this time would likely reflect this sort of pricing. The subsequent lines reflects changing forward curves for each year after that.

Figure 2: Historical forward curves and spot prices

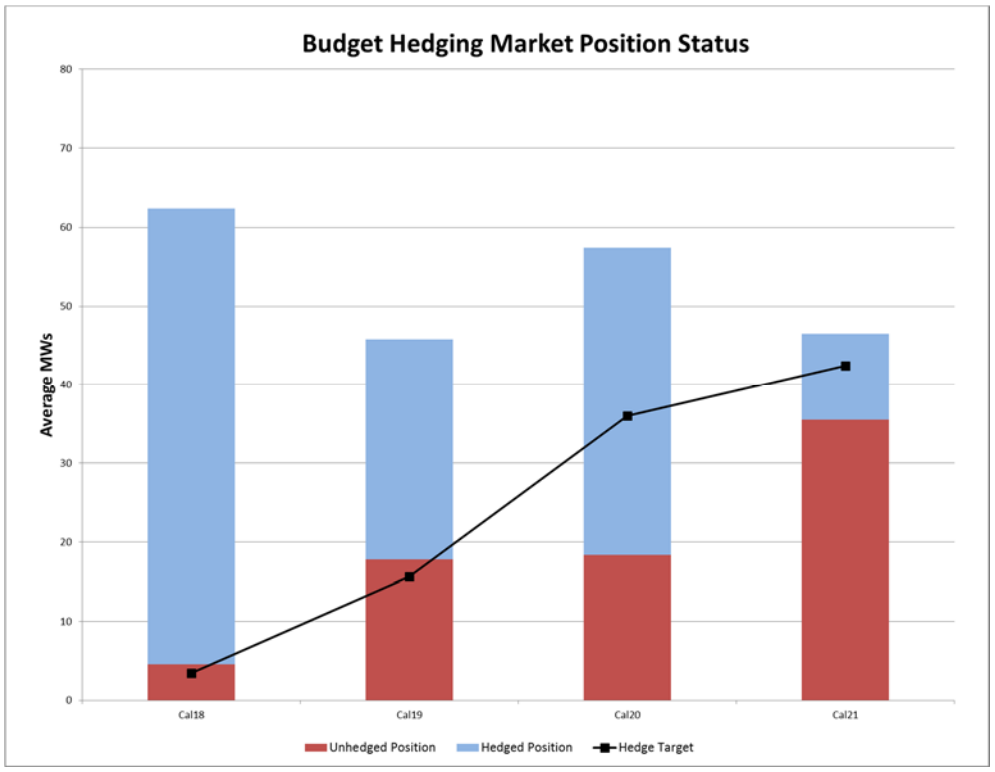


Surplus Position Hedging Update

The chart below shows EWEB's surplus market position for 2017-2021 based on the budget hydro assumption of 90% of expected hydro conditions. The top of the chart indicates EWEB's original surplus market position. The red band represents unhedged energy surplus. The black line reflects the desired volume of hedging the RMC would like to achieve over time.

EWEB hedges a portion of its surplus position up to five years in advance. This provides two benefits: 1) it reduces financial exposure related to market prices; and 2) it results in sales executed at various times which diversifies the sales price by "dollar cost averaging" through time. This strategy results in near term years being fully hedged while year five is the least hedged, with interim years somewhere in between. Beyond five years Power Operations does not hedge any surplus energy.

The value of all current executed hedges for forward periods is approximately $12M of forward value when compared to today's market. Said another way, EWEB has benefited by an estimated $12M compared to not hedging for the period from today through 2021.



Requested Board Action - None