



MEMORANDUM

EUGENE WATER & ELECTRIC BOARD

Rely on us.

TO: Commissioners Carlson, Mital, Helgeson, Schlossberg, and Brown
FROM: Susan Ackerman, Chief Energy Officer
DATE: April 2, 2019
SUBJECT: 2019 Power Market, Budget Hedging, and Generation Update
OBJECTIVE: Information Only

Issue

The purpose of this backgrounder is to provide an annual update of wholesale power markets and generation resource outlook.

Background

The Power Planning and Trading Operations sections manage EWEB's 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. Generation manages EWEB's owned generation assets.

Discussion

Market Price Update

Wholesale energy markets can generally be described as either near term "spot markets" or longer term "forward markets"¹. For spot markets, prices are impacted by weather (e.g., temperature and precipitation) and operational phenomena (e.g., generation and transmission availability), while forward markets reflect longer term market expectations of energy supply and consumer demand.

Spot Markets

The 2018 spot market finished higher than the previous 5 year average (Figure 1, below). This shift was predominantly driven by unforeseen natural gas transmission events in Southern California² and Canada³ which resulted in limited gas supply. The generation mix in the northwest is such that the marginal resource is nearly always natural gas generation. As a result, swings in natural gas pricing can have a dramatic impact on power prices, especially in the day-ahead or greater timeframes. These events occurred during periods of extreme weather, when

¹ Spot markets typically refer to markets where commodities are traded for immediate (next day, next hour) delivery, whereas forward markets imply markets where the traded commodity is delivered in a future period.

² <https://www.eia.gov/todayinenergy/detail.php?id=37112>

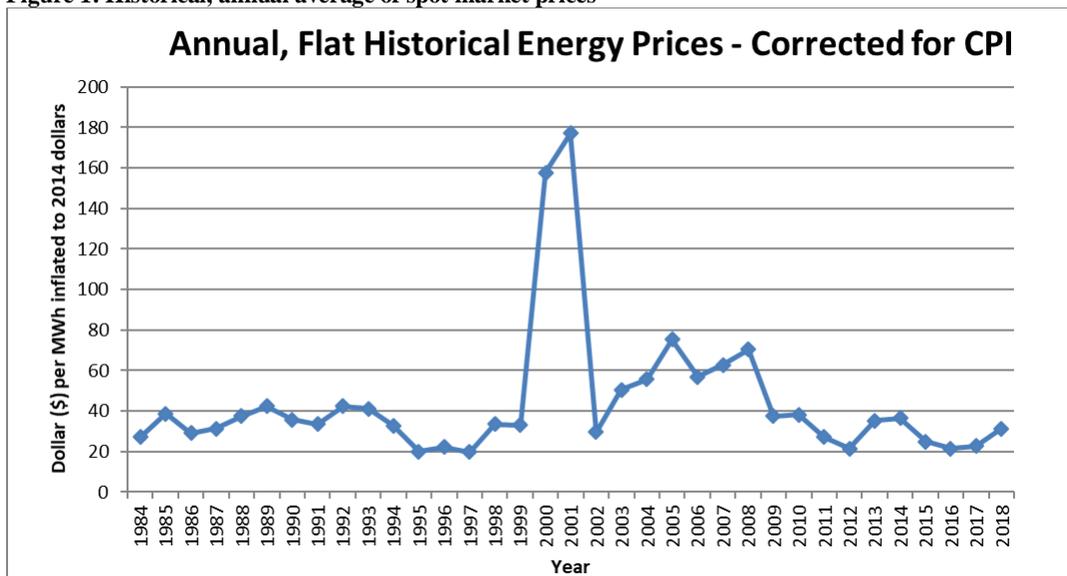
³ <https://www.eia.gov/todayinenergy/detail.php?id=37312>

regional natural gas supplies were already stressed due to higher than normal demands for electric generation and/or space heating. During this time, day-ahead, peak energy prices were routinely above \$60/MWh, peaking above \$300/MWh in August. During the same period, real-time energy prices frequently surpassed \$100/MWh, peaking above \$400/MWh.

To date in 2019, the northwest has seen a slow start to the hydro year (i.e., the amount of water forecasted to be available for generation). It is currently anticipated that regional hydro generation will be approximately 85% of normal for the year. Given regional hydro and continuing gas supply limitations, staff anticipates more price volatility in 2019 than in recent years. Illustrating this point, starting in mid-February regional loads increased as cold weather set in. This stressed an already limited natural gas supply to the point where daily gas traded for over 16 times the normal price. With the continued cold weather, day-ahead markets routinely saw on-peak energy pricing above \$100/MWh, peaking over \$900/MWh in March during a gas pipeline event. Real-time prices during this period have frequently been in the \$80-100/MWh range; peaking near \$200/MWh. Staff anticipates that this sort of price volatility is likely to continue into the summer, when California loads peak.

It should be noted that the U.S. Energy Information Administration (“EIA”) anticipates that Henry Hub natural gas prices will stay relatively stable through 2020⁴. The price volatility that the west coast is currently experiencing is generally being caused by temporary transmission and storage scarcity⁵, not necessarily limited gas production.

Figure 1: Historical, annual average of spot market prices



Forward Markets

Some of the drivers noted above also impact forward markets, the delivery of power at prices agreed upon today. As such, for the first time in several years forward market prices have shown relative strength compared to historical trends. The natural gas delivery limitations noted above

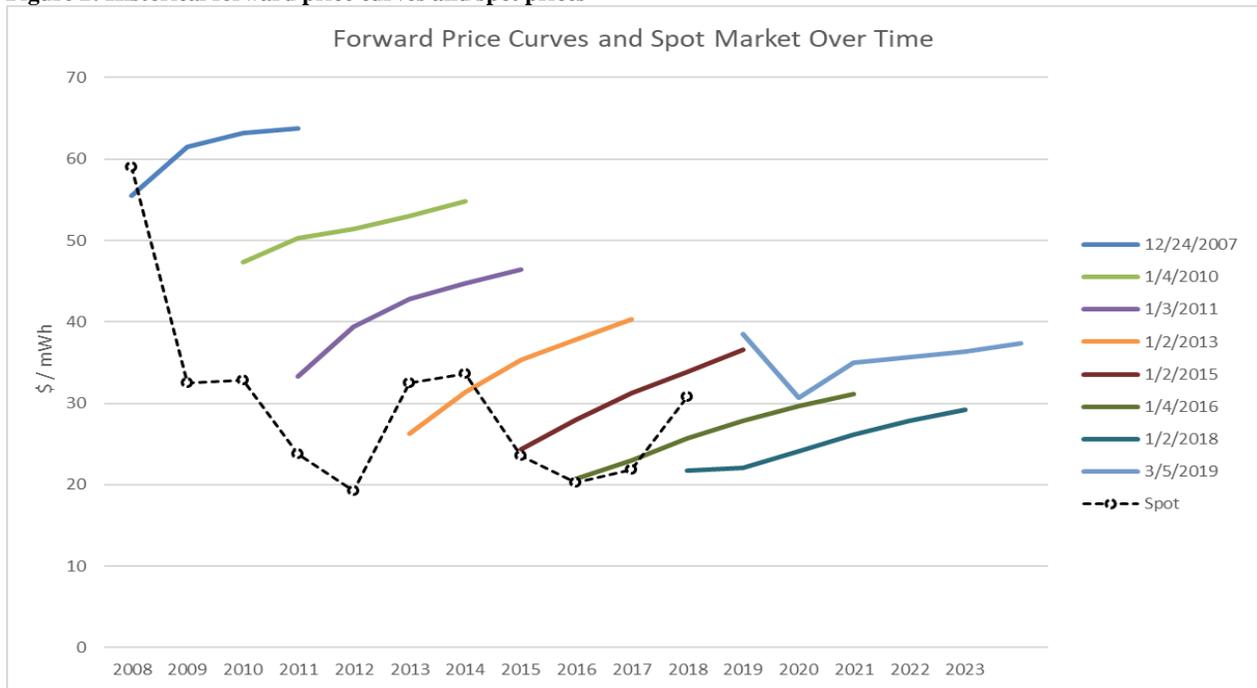
⁴ <https://www.eia.gov/todayinenergy/detail.php?id=38052>

⁵ <https://www.eia.gov/naturalgas/storage/dashboard/>

are likely responsible for most of this increase, but prices may also be seeing some support from tightening greenhouse gas (GHG) emission policies and practices.

Figure 2, below, shows both forward market price curves, and spot market prices, over time. A forward curve reflects prices for future periods of delivery, which can be traded at today. The first line reflects a forward curve was taken at the end of 2007. Trades executed during this time would likely reflect this sort of pricing. The subsequent lines reflect changing forward price curves for each year after that.

Figure 2: Historical forward price curves and spot prices



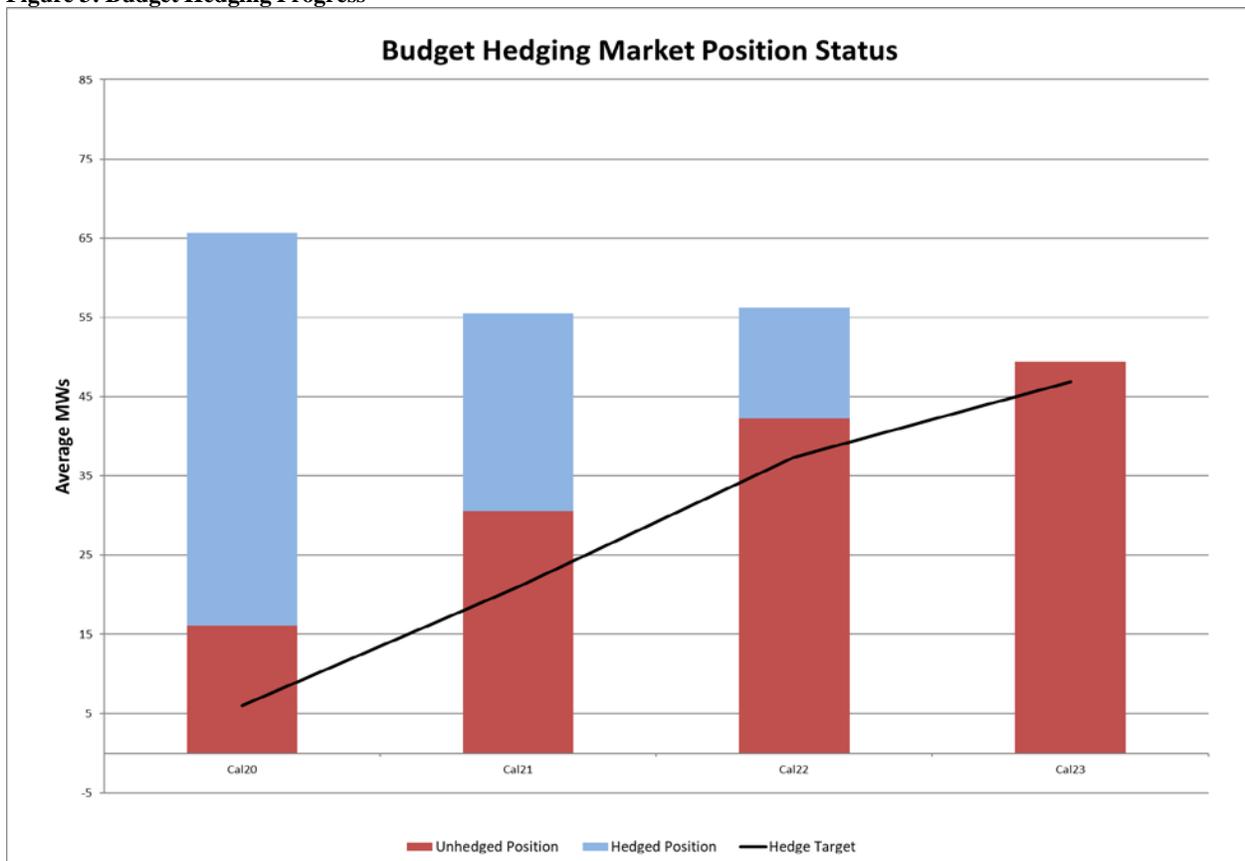
Surplus Position Hedging Update

Figure 3, below, shows EWEB’s surplus market position for 2020-2023 based on the budget hydro assumption, or 90% of expected hydro generation. The top of each stacked column indicates EWEB’s original surplus market position; i.e., the amount of forecasted generation EWEB expects to realize in excess of that which is forecasted as being necessary for reliable load service. The blue bar represents the volume of energy hedged⁶ by staff. The red bar represents the remaining unhedged surplus. The black line reflects the desired pace of hedging activity the Risk Management Committee (RMC) would like to achieve over time.

In accordance with EWEB’s Risk Management Procedures, staff 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 EWEB does not hedge any surplus energy.

⁶ A hedge is a trade or set of trades that reduces the market price exposure risk inherent in EWEB’s portfolio length.

Figure 3: Budget Hedging Progress



EWEB Owned-Generation Update

The Leaburg power canal and powerhouse remain offline due to dam safety concerns identified last fall. EWEB has an approved investigation plan for the canal and is working on repair designs. We hope to have the canal back in operation before the end of summer 2019. However, both the work and the repair plans are contingent on FERC approval. The Carmen-Smith facility, including both the Carmen and Trail Bridge powerhouses will go offline on April 1, 2019 for the second year of facility upgrade work. In 2019 EWEB will replace the electrical switchgear and transformers and rebuild the Carmen substation. We expect the Carmen-Smith facility to return to service in November 2019. EWEB’s other generation facilities are scheduled to have typical minor maintenance outages throughout the year. Excepting for unplanned revisions to schedule, these maintenance outages are included in the current budget.

Following a cold and wet February and March, the 2019 hydrologic year for the Oregon Cascades, which will affect EWEB’s owned hydroelectric resources, looks to be just below average, with current McKenzie streamflow projections of 95% of average and March snowpack estimates in the McKenzie basin of approximately 111% of normal. Based on these forecasts, we expect to be able to operate the Walterville facility normally throughout the year.

EWEB’s other owned generation facilities continue to operate normally and are expected to do so throughout 2019.

Requested Board Action - None