Department of Energy

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CAISO Local Market Power Mitigation Enhancements
Revised Straw Proposal , November 16, 2018
Bonneville Power Administration Comments

Submitted by	Company	Date Submitted
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Bonneville Power Administration (Bonneville) appreciates CAISO's work on the Local Market Power Mitigation stakeholder process as well as the robust participation and engagement of numerous stakeholders in the working group meeting of 10 October 2018 and in the web conference for the revised straw proposal issued 16 November 2018. Bonneville appreciates the significant progress made on the issues of flow reversal, economic displacement, and hydro default energy bid formulation and offers the attached comments to continue progress on these issues.

Bonneville is a federal power marketing administration within the U.S. Department of Energy that markets electric power from 31 federal hydroelectric projects and some non-federal projects in the Pacific Northwest with a nameplate capacity of 22,500 MW. Bonneville currently supplies 30 percent of the power consumed in the Northwest. Bonneville also operates 15,000 miles of high voltage transmission that interconnects most of the other transmission systems in the Northwest with Canada and California. Bonneville is obligated by statute to serve Northwest municipalities, public utility districts, cooperatives and then other regional entities prior to selling power out of the region.

Hydro Default Energy Bid

Bonneville proposes the following general changes to the proposed Default Energy Bid (DEB) formulation. More detail and context is discussed in the remainder of these comments.

- Establish a methodology for determining the scalar using fixed energy availability and dispatch efficiency parameters
- Refresh the scalar calculation at least annually.

- Allow short-term storage resources the option to elect multiple trading hubs, just as proposed for long-term storage resources.
- Replace the average heat rate with a peaking heat rate in the calculation of the gas price floor.
- Allow for intra-day gas price changes in calculating the gas price floor, in alignment with the proposal's suggested treatment of reference price adjustments for gas resources.
- Recognize the ability of downstream projects to leverage upstream storage, extending the functional storage capability of the downstream projects.

In previous comments as part of this stakeholder process Bonneville has outlined, in its view, the features of an appropriate default energy bid methodology. Among these desiderata were 1) that the scalar be empirically derived and 2) that the ultimate methodology for determining the appropriate scalar be a repeatable process whose output can be refreshed on a regular, mutually-agreeable cadence. The CAISO outlines in the current proposal the construction of proxy-price duration curves (through application of a scalar to a resource's relevant market price indices) for hydro resources in which the appropriate scalar would be determined by a pre-selected percentile of the applicable duration curve. Bonneville is encouraged by this particular portion of the proposal and appreciates the CAISO's stated willingness to provide analysis in support of an empirically-derived scalar.

Establish the methodology and regularly refresh the output of that methodology

One of Bonneville's remaining significant concerns is the repeatability of the method CAISO presented in the proposal in deriving the scalar. The scalar is meant to serve a dual role as a proxy for variation. For short-term indices such as the day-ahead index, the scalar is an immediate proxy for intra-day variation in energy prices. For long-term indices which reflect the average value of on-peak energy over many days, the scalar is intended to accommodate both intra-month variation in daily price levels as well as intra-day variation in hourly prices. Both types of variation are driven largely by evolving fundamental market conditions, and this evolution should be acknowledged explicitly in the DEB formulation. Specifically, Bonneville suggests that CAISO, in the course of this stakeholder process, establish fixed values for the relevant parameters – *energy availability* and *dispatch efficiency*[1] – at mutually agreeable levels and, importantly, that the CAISO revisit the calculation of the resultant scalar on a regular cadence. Bonneville suggests updating the calculation at least annually. Bonneville stresses the importance of these two items – the reproducibility of the calculation and the regular recalculation of the scalar itself – in achieving the desired durability of the ultimate DEB formulation, so that the DEB methodology produces a scalar that is robust to ever-evolving market fundamentals.

Regarding the spectrum of possible parameter values, Bonneville offers this input for the *energy availability* parameter. The robustness of the proposed methodology in approximating hydro opportunity costs is highly dependent on the prevailing hydrological condition (e.g., water-year

[1] Bonneville uses the term *energy availability* in these comments in accordance with its understanding of the term's meaning as presented in the proposal – the percentage of hours per day (or week) that a resource may be dispatched. Bonneville uses the term *dispatch efficiency* to mean the frequency (percentage of intervals) with which a resource is dispatched at or below its energy availability.

snow pack). This dependence may be particularly acute for hydro resources with short-term storage. Bonneville suggests that an energy availability parameter of less than 20% for resources with short-term storage (i.e., one to three months) will reliably produce a scalar that is more robust to significant variation in hydrological condition. Bonneville suggests that an energy availability parameter equivalent to 4 hours per day (4/24) or 28 hours per week (28/168) will promote this robustness and carries a more facile interpretation.

Allow short-term storage resources the option of multiple trading hubs

Bonneville appreciates and supports the addition of both default trading hubs and multiple trading hubs (where demonstrable through long-term transmission rights showing). The addition of multiple trading hubs for long-term storage resources was explicitly proposed, but was not explicitly extended to short-term storage resources. Bonneville notes that resources with short-term storage have marketing opportunities beyond their most proximate trading hub. As such, Bonneville recommends that the hydro default energy bid formulation allow for multiple trading hubs for short-term resources where demonstrable through concomitant transmission rights showing. When multiple trading hubs are utilized in DEB formulation, Bonneville recommends that the value of the power price index for the day-ahead, balance-of-month, and applicable months used in the formulation of the short-term DEB and the long-term DEB be the maximum of the power price indices for the power trading hubs that the Participating Resource Scheduling Coordinator has demonstrated transmission rights to for that month. This is in line with marketing objectives that direct energy toward accessible hubs where it is most valuable.

Gas Price Floor

Bonneville appreciates the addition of the gas floor as a vital component in the proposed DEB formulation. Recognizing that the inclusion of this element is intended to reflect energy replacement costs and the flexibility for hydro resources to target operations in the peak hours of the day, Bonneville believes that it is more appropriate and more supportable to calculate the gas floor using a peaking heat rate (in the 10 to 13 range) rather than the average heat rate (approximately 7.8) that was proposed. This suggested increase in the heat rate is especially appealing because it accommodates a commensurate reduction in the scalar applied to the gas floor, achieving alignment with CAISO's existing treatment of gas price volatility – the 110% scalar adjustment to gas prices used in the variable cost DEB option and commitment cost reference levels. Pursuant to this alignment, Bonneville also recommends that the intra-day gas price changes proposed as an element of this Revised Straw Proposal be extended to the gas floor utilized in the proposed DEB formulation. Inclusion of these features also allays many concerns stakeholders may have with respect to the proposed elimination of the reference price adjustment for hydro resources.

Storage Horizon

Bonneville supports the use of a resource's maximum storage horizon in determining the number of monthly forward power price indices to include in the resource's DEB calculation. The proposal left open-ended what specific evidence should be used to support this determination. During the Stakeholder Web Conference of 28 November 2018, Bonneville noted discussions of project-specific attributes, such as historical cycling of forebay elevation, as well as physical characteristics of cascading hydro systems. Bonneville adds that a resource's storage horizon should reflect any contractual rights that the participating resource owner has for influencing

outflow from an upstream project. In effect, such rights augment the physical storage horizon of the participating resource. Similarly, the storage horizon of the participating resources downstream of the headwater resources should reflect the maximum storage horizon of the upstream participating resource. The storage horizon parameter of a resource should be provided consistent with update cadence to other elements of the Master File.

In summary, Bonneville's proposed changes to the DEB formulation imply the following formulas:

$$ST\ DEB = MAX\{Gas\ Floor, (1+\alpha) * (DA\ Index, BOM\ Index, M\ Index_{+1}, M\ Index_{+2}, M\ Index_{+3})\}$$

$$LT\ DEB = MAX\{ST\ DEB, 1.1 * (M\ Index_{+4}, M\ Index_{+5}, M\ Index_{+6}, \dots, M\ Index_{+12})\}$$

$$\alpha = f(energy\ availability = 16.67\%, dispatch\ efficiency = 95\%)$$

For example, using the proposed methodology:

$f(16.667\%, 95\%) \approx .35$; $f(15\%, 95\%) = .43$; $f(10\%, 95\%) = .65$

$$Gas\ Floor = Peaking\ Gas\ Heat\ Rate * GPI * 1.1 \approx 11{,}176^{2} * GPI * 1.1$$

Additional Considerations

Bonneville is concerned that the use of EIM prices in the current proposal limits the applicability of the proposed methodology should this DEB framework be extended to other markets, such as extension of the day-ahead market into the EIM Area (informally referred to as EDAM). Bonneville suggests establishing an analogous framework for DEBs for other market timeframes using pricing that is commensurate with those market timeframes. Further, because such an extension of the market would represent exposure to a greater MW amount, Bonneville would recommend raising the dispatch efficiency parameter to 99% of intervals, thereby lowering the risk of a hydro resource being inefficiently dispatched to 1% of the time (3-4 days) or less.

Bonneville acknowledges that the proposal states that the DEB formulation would apply to hydro projects with a storage horizon as short as 24 hours and indicated the exclusion of "run-of-river" projects. Bonneville notes that the explicit definition of "run-of-river" is unsettled and that a formal delineation between short-term storage and "run-of-river" will need to be determined for the purposes of this stakeholder process and any resultant documentation. Bonneville believes that all of the resources that it is considering for participation in the EIM would be classified as eligible for the proposed hydro DEB.

Prevention of Economic Displacement

Bonneville continues to support the proposed changes to prevent economic displacement and flow reversal, namely the limitation of EIM transfers between balancing authority areas to the greater of the flexible ramping upward requirement of the exporting balancing authority; or the pre-mitigation export quantity. Bonneville also recognizes the computational requirement for a

[2] See "Table 8.2. Average Tested Heat Rates by Prime Mover and Energy Source, 2007 – 2017: Gas Turbine, 2017" in https://www.eia.gov/electricity/annual/html/epa_08_02.html

nominal price adder to the competitive locational marginal price to support prevention of economic displacement or flow reversal due to mitigation.

Bonneville agrees that the election to limit transfer should be the province of the EIM Entity.

Removal of Reference Level Adjustment

Bonneville is concerned with the proposed elimination of the reference level adjustment for hydro resources. However, these concerns may be mitigated significantly by including intra-day gas price adjustments in the gas price floor, as outlined above.