Western Resource Adequacy Program
Settlement and Pricing Proposal – Proposal

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Background

To ensure a well-functioning RA Program, it is critical that the settlement pricing be calculated appropriately. Pricing should encourage entities with a negative Sharing Requirement to address capacity shortfalls using other means before accessing the program's pooled capacity. When those entities with a positive Sharing Requirement holdback and/or deliver energy, the pricing should adequately compensate their contribution to the program without being punitive to entities truly in need.

Proposal Topics

1. Applicable indices
2. Settlement pricing for holdback and delivery
3. Calculation and posting of settlement quantities and prices
4. Participant charge for non-delivery of holdback

Applicable Indices

A key component of the settlement and pricing methodology is having prices that are reflective of the market value of energy in both day-ahead and real-time and are applicable to specific areas in the broad geographic footprint of the WRAP. To support the development of the settlement and pricing approach, the WRAP has selected the following indices and market-based prices to serve as the representation of day-ahead and real-time energy values.

For those entities participating in the Northwest region the following prices will be utilized:

- **Day-ahead Price:** Ice Day-Ahead (DA) Mid C Index
- **Realtime Price:** Powerdex Realtime Index

For those entities participating in the Eastern and Southwest Regions the following prices will be utilized:

- Day-ahead Price: Ice DA Palo Verde Index
- Realtime Price: Average of the 4 fifteen-minute (FMM) market results for the Palo Verde intertie in the CAISO market (FMM Scheduling Point / Tie Combination LMP; Node: PALOVRDE_ASR-APND; Tie: PVWEST)

Holdback and Delivery Settlement Pricing

Settlement Price Calculation

The proposed settlement price is based on the CAISO methodology for implementing FERC Order 831. This methodology has the benefit of having been developed with significant stakeholder input during the CAISO's 831 implementation and was ultimately accepted by FERC. The Settlement Price is shaped using a shaping factor that reflects changes in energy/capacity value from hour to hour and is based on locational indices at Mid C and Palo Verde (PV).

The settlement price is based on a regional index price, shaped hourly, plus a 10% adder. The adder is intended to help ensure the price is set at a level that incentivizes use of the bilateral market to prior to accessing pooled capacity if possible.

If the settlement price does not adequately reflect the foregone opportunity cost of the entity providing holdback, as measured by selling the heavy load block at the applicable locational index (Mid C or PV), then a make whole payment will be triggered, payable from the receiving entity.

Definition: Total Settlement Price

$$\textbf{Total Settlement Price} = \textbf{MAX}(\textbf{MIN}(\$2000, \textbf{Hourly Shaping Factor} \times \textbf{Applicable Index Price} \times 110\%), 0)$$

Where:

- **The Hourly Shaping Factor is selected based on the most recent High-Priced Day. A High-Priced Day is a when at least a single hour in the day has a system marginal energy cost (SMEC) greater than $200. If no High-Priced Day exists in the current season, it will look to the most recent High-Priced Day of the same season in previous years.**

$$= 1 + \left[\frac{CAISO\ Hrly\ DA\ SMEC - CAISO\ Avg\ DA\ SMEC(on\ or\ offpeak\ hours)}{CAISO\ Avg\ DA\ SMEC(on\ or\ offpeak\ hours)}\right]$$

- **The Applicable Index Price is the day ahead ICE Index price based on the location of the delivering entity. For example, this may be the Mid-C or PV price published for the day and hour when the holdback and/or energy is requested.**

- **For Sundays a 1x16 index is used if available and the holdback occurs during HE7-HE22, otherwise the applicable light load index is used**

Application of the Settlement Price

The Settlement Price is split into two components, 1) a capacity price for confirming the need for a holdback in preschedule, referred to as the Holdback Settlement Price, and 2) an energy price charged for any energy dispatched in the operational program after a holdback has been confirmed, referred to as the Energy Settlement Price.

The *Total Settlement Price* is then split into its two underlying components: the *Energy Declined Settlement* and the *Holdback Settlement Price*.

Definition: Energy Declined Settlement Price
$$\textbf{Energy Declined Settlement Price} = \textbf{lesser of} \begin{cases} \boldsymbol{Applicable\ Powerdex\ (or\ similar)\ hourly\ index, or\ the\ Settlement\ Price} \\ \textbf{80\%} \end{cases}$$
80% factor ensures that sellers will receive at least 20% for carrying holdback regardless of energy deployment.
Definition: Holdback Settlement Price
$$\textbf{Holdback Settlement Price} = \textbf{Total Settlement Price} - \textbf{Energy Declined Settlement Price}$$
Final Settlement For Any Applicable Hour
$$\textbf{Final Settlement (for any applicable hour)} = (\textbf{Holdback Settlement Price} \times \textbf{Holdback MW Requested}) + (\textbf{Energy Settlement Price} \times \textbf{Operational Energy MWh Dispatched})$$

Make Whole Payment

The Make Whole Payment is triggered in the event that the settlement revenue and the estimated value of the non-dispatched energy is less than what the selling entity would have received had they sold a day-ahead block of energy instead.

Definition: Make Whole Payment

$$\textbf{Make Whole Payment (when applicable)} = \textit{Possible Block Sale Revenue} - \textit{Final Settlement Revenue} - \textit{Realtime value of declined energy} - \textit{Realtime value of unheld energy}$$
Ensures that the seller is no worse off than had they sold the energy as a block in day-ahead. The MW amount associated with the Possible Block Sale Revenue is the maximum amount requested for the hours in the block.
Definition: Realtime value of declined energy
$$\textbf{Realtime value of declined energy} = \textbf{Energy Declined} \times \textbf{Energy Declined Settlement Price}$$
Declined energy is only applicable to those hours where there was positive holdback.
Definition: Realtime value of unheld energy
$$\textbf{Realtime value of unheld energy} = (\textbf{Maximum holdback MW in block} - \textbf{Holdback MW Requested}) \times \textbf{Applicable Powerdex (or similar)hourly index}$$
This represents the value that is realized by marketing unheld energy at the applicable real-time index.

Calculation and Posting of Settlement Quantities and Prices

The Program Administrator (PA) will have responsibility for calculating and posting settlement quantities and prices based on Program Operator (PO) calculated delivery and holdback. The process by which any non-delivery or additional energy that is delivered voluntarily is communicated from the Participants to the PA and PO has not yet been developed.

Participant Charge for Non-delivery of Holdback

The WRAP will have a robust framework in which non-delivery events are evaluated and may be waived if they meet a set of program-defined criteria. If a Participant is requested to deliver holdback and fails to do so without a valid waiver / exemption they will be subject to a non-delivery charge. An instance of non-delivery is defined as failure to deliver required holdback on one or more hours on any operating day, where a day is defined as the time beginning at 00:00 and ending at 24:00 PPT.

The hourly non-delivery charge is calculated as:

Maximum of (applicable day ahead and realtime price on hour of non − delivery) x penalty factor

and is charged for every MWh of a non-waived delivery failure.

The penalty factor scales based on number of non-delivery instances in both seasons of the year and whether the energy that wasn't delivered was able to be served by someone else in the program. The penalties are intended to be high enough that non-delivery is not an economic option. The relatively high penalty factors are believed to be just and reasonable because the program will have a robust waiver of delivery failure process and non-delivery may lead to a load shedding event for the deficit entity.

Definition: Penalty for NON-WAIVED Delivery Failures in year (multiple failures in the same day constitute 1 delivery failure when calculating the penalty factor)	
If a Participant fails to provide energy and that deficit is entirely covered by other Participants of the WRAP, the penalties are as follows:	
First day with non-waived delivery failure(s)	5 times the index price of the default centroid for the undelivered megawatt hours (MWhs)
Second day with non-waived delivery failure(s)	10 times the index price of the default centroid for the undelivered MWhs
Third day or more with non-waived delivery failure(s)	20 times the index price of the default centroid for the undelivered MWhs and be cause for review for expulsion by the Delivery Failure Review Committee
If a Participant fails to provide energy and that deficit is not entirely covered by other Participants of the WRAP, the penalties are as follows:	
First day with non-waived delivery failure(s)	25 times the index price of the default centroid for the undelivered MWhs
Second day with non-waived delivery failure(s)	50 times the index price of the default centroid for the undelivered MWhs and be cause for review for expulsion by the Delivery Failure Review Committee

Participant Maximum Accumulated Non-Delivery Charge

Because the potential impact of non-delivery is load shedding the above multipliers are intended to provide a significant incentive to deliver holdback energy as requested. However, they are not intended to compound in such a way that the Participant Charge for Non-Delivery becomes punitive. To protect against over penalization the total amount of accumulated non-delivery charges for an individual Participant will be capped at the CONE equivalent non-delivery charge ceiling. This ceiling resets at the end of every second season and is calculated using the following methodology (on a per-Participant basis).

1. At the end of month one in the first season of the year, the maximum hourly non-delivery amount for that month is utilized to calculate a value equivalent to the CONE penalty. Meaning the hourly amount will be treated in the same way as a deficiency in that same amount for that month in the forward showing. The resulting equivalent CONE penalty is calculated as:

   $$\boldsymbol{maximum\ hourly\ non-delivery\ for\ month\ x\ CONE\ x\ CONE\ Factor\ from\ FS\ x\ 1000}$$

2. At the end of month two in the first season of the year, the maximum hourly non-delivery amount for that month is utilized to calculate a value equivalent CONE penalty. If the maximum hourly non-delivery amount in the current month is higher than all previous months in the current year the equivalent CONE is calculated as

   $$\boldsymbol{maximum\ hourly\ non-delivery\ for\ month\ x\ CONE\ x\ CONE\ Factor\ from\ FS\ x\ 1000}$$

   and all previous month's values are recalculated using the monthly incremental penalty of

   $$\boldsymbol{maximum\ hourly\ non-delivery\ for\ month\ x\ 15.302\ x\ 1000}$$

   If the maximum hourly non-delivery amount in the current month is lower than the previous highest value in the current year, the equivalent CONE value is calculated as

   $$\boldsymbol{maximum\ hourly\ non-delivery\ for\ month\ x\ 15.302\ x\ 1000}$$

3. This calculation would continue for each month of both seasons in the year and the monthly result would be added to all previous months. This accumulated value is the CONE equivalent non-delivery charge ceiling. If at any time the accumulated non-delivery charge for a given Participant is greater than or equal to the CONE equivalent non-delivery charge ceiling that Participant will no longer be subject to non-delivery penalties.

Any non-delivery charge collected by the PA where the deficit was met by other Participants of the WRAP will be used to reduce program administration costs. Any non-delivery charge collected by the PA where the deficit was not met by other Participants of the WRAP will be collected by the PA and passed through to the entity that had unserved deficit.

Delivery Failure Review Committee

The Delivery Failure Review Committee's responsibility is to make recommendations to the NWPP Board of Directors about standing in the WRAP and continued participation for those Participants that have incurred top tier penalties (20x if the deficit can be served, 50x if it cannot be served). This committee will not be responsible for granting waivers. The wavier request and review process will be managed by the PO.