**11.5.4 Imbalance Energy Pricing; Non-Zero Offset Amount Allocation**

**11.5.4.1 Real-Time Imbalance Energy Offset**

(a) **Financial Value of EIM Transfers.** For each Balancing Authority Area in the EIM Area, the CAISO will calculate the Real-Time Market financial value of EIM Transfers as the product of the EIM Transfer MWh, either positive or negative, and the System Marginal Energy Cost, plus a greenhouse gas financial value credit calculated as the product of the portion of the EIM Transfers that do not correspond to a greenhouse gas compliance obligation under the regulations administered by the California Air Resources Board and the Marginal Greenhouse Gas Cost.

(b) **Initial Calculation.** The CAISO will initially calculate the Real-Time Imbalance Energy Offset to be recovered on a 5-minute basis for each Balancing Authority Area in the EIM Area as the sum of the financial value of EIM Transfers and the Settlement amounts for FMM Instructed Imbalance Energy and RTD Instructed Imbalance Energy, Uninstructed Imbalance Energy, EIM Bid Adders, and Unaccounted For Energy, and for the CAISO, Real-Time Virtual Bid Settlement, plus the Real-Time Ancillary Services Congestion revenues and Virtual Awards settlements in the Real-Time Market in accordance with Section 11.3, less the Real-Time Congestion Offset and less the Real-Time Marginal Cost of Losses Offset.

(c) **Allocation.** The CAISO will allocate the adjusted Real-Time Imbalance Energy Offset –

(1) for the CAISO Balancing Authority Area, to Scheduling Coordinators in the CAISO Balancing Authority Area according to Measured Demand; and

(2) for EIM Entity Balancing Authority Areas, to the applicable EIM Entity Scheduling Coordinator.

(d) **Residual Neutrality Amounts.** The CAISO will allocate any residual Real-Time Imbalance Energy Offset amount to Scheduling Coordinators in the EIM Area based upon EIM Measured Demand.

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**29.32 Greenhouse Gas Regulation and EIM Bid Adders.**

(a) **EIM Bid Adders.**

(1) **In General.** EIM Participating Resources will have an opportunity to recover costs of compliance with California Air Resources Board greenhouse gas regulations, which may include the cost of allowances, uncertainty on the final resource specific emission factor, and other costs of greenhouse gas regulation compliance.

(2) **EIM Bid Adder.**

(A) **Bid Submission.** EIM Participating Resource Scheduling Coordinators for EIM Participating Resources located in an EIM Entity Balancing Authority Area outside of California may submit an EIM Bid Adder as a separate hourly Bid component to recover costs of compliance with California Air Resources Board greenhouse gas regulations, which must include a price and quantity and the price portion of which must be equal to or less than 110% of the EIM Participating Resource’s greenhouse gas maximum compliance cost as determined in accordance with section 29.32(a)(3).

(B) **Default Treatment.** If an EIM Participating Resource located in an EIM Entity Balancing Authority Area outside of California does not submit an EIM Bid Adder, the CAISO will assume that the EIM Participating Resource will not be selected for delivery to the CAISO Balancing Authority Area.

(3) **Determination of EIM Greenhouse Gas Maximum Cost.** Each day the CAISO will determine the greenhouse gas maximum compliance cost for each EIM Participating Resource located in an EIM Entity Balancing Authority Area outside of California as set forth in the EIM Business Practice Manual, based on-

(A) the EIM Resource’s highest incremental heat rate; the applicable Greenhouse Gas Allowance Price; and the EIM Participating Resource’s emission rate, as set forth in the applicable U.S. Environmental Protection Agency publication and registered in the Master File; or

(B) a price determined in accordance with the negotiated rate option procedures in section 39.7.1.3.1; or,

(C) with respect to, and only with respect to, Bids at EIM External Interties, the carbon dioxide equivalent emission rate of the resource with the highest such rate in the WECC region and the applicable Greenhouse Gas Allowance Price index.

(4) **EIM Bid Adder Price.** The price included in the EIM Bid Adder shall not be less than $0/MWh and the sum of the price component of the EIM Bid Adder and the Energy cost portion of the Bid cannot exceed $1000/MWh.

(b) **Consideration of EIM Bid Adders in Market Clearing.**

(1) **Dispatch of EIM Participating Resources with Nonzero Bid Adders.** The CAISO’s Security Constrained Economic Dispatch in the Real-Time Unit Commitment and Real-Time Dispatch shall take into account EIM Bid Adders in selecting Energy produced by EIM Participating Resources located in an EIM Entity Balancing Authority Area outside of California for import into the CAISO Balancing Authority Area or other EIM Entity Balancing Authority Areas in California up to the associated MW quantity included in the EIM Bid Adder, but not when selecting EIM Participating Resources to serve Load outside of the combined area of the CAISO Balancing Authority Area and other EIM Entity Balancing Authority Areas within California.

(2) **EIM Participating Resources EIM Bid Adder MW Quantity.** The CAISO’s Real-Time Unit Commitment and Real-Time Dispatch will limit the maximum EIM Bid Adder MW quantity of an EIM Participating Resource to a value equal to the EIM Participating Resource’s dispatchable Bid range between the EIM Participating Resource’s Base Schedule and the EIM Participating Resource’s effective upper economic Bid, considering any applicable derates and ancillary services capacity reservations, for the relevant Operating Hour.

(3) **Dispatch of EIM Participating Resources Bid Adders of Zero.** The CAISO’s Security Constrained Economic Dispatch in the Real-Time Unit Commitment and Real-Time Dispatch shall not dispatch EIM Participating Resources outside the combined area of the CAISO Balancing Authority Area and other EIM Entity Balancing Authority Areas within California for delivery into the CAISO Balancing Authority Area or other EIM Entity Balancing Authority Areas in California if the MW quantity included in the EIM Bid Adder is zero.

(c) **Effect on Locational Marginal Price.** Using the methodology described in Appendix C, the CAISO will include the Marginal Greenhouse Gas Cost as a negative component in the Locational Marginal Prices for EIM Entity Balancing Authority Areas not subject to a greenhouse compliance obligation under the regulations administered by the California Air Resources Board in addition to those specified in Appendix C and Section 27.

(d) **Notice to EIM Participating Resource.** The CAISO will notify the EIM Participating Resource Scheduling Coordinator through the Dispatch Instruction of the megawatt quantity of any Energy of an EIM Participating Resource located in an EIM Entity Balancing Authority Area outside of California that is deemed to have been imported into the CAISO Balancing Authority Area or other EIM Entity Balancing Authority Areas in California as a result of the Market Clearing of the Real-Time Market.

(e) **Compensation.** The CAISO will allocate the Net Imbalance Energy Export optimally to EIM Participating Resource Scheduling Coordinators and will distribute revenues from the EIM Bid Adder to EIM Participating Resources pursuant to that allocation.

(f) **Reporting Requirements.** The CAISO will report to each EIM Participating Resource Scheduling Coordinator the portion of the FMM Energy Schedule and the portion of RTD Energy Dispatch that is associated with Energy deemed to have been imported to the CAISO Balancing Authority Area or other EIM Entity Balancing Authority Areas in California from all EIM Resources as part of the Real-Time Market results publication from each of its EIM Resources.

**\* \* \* \* \***

**Appendix A**

**Master Definitions Supplement**

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**- EIM Bid Adder**

A Bid component composed of a MW quantity and price that provides EIM Participating Resources an opportunity to recover costs of compliance with California Air Resources Board greenhouse gas regulations.

**\* \* \* \* \***

**- Marginal Greenhouse Gas Cost**

The LMP component representing the shadow price of the Net Imbalance Energy Export constraint.

**\* \* \* \* \***

**Appendix C**

**Locational Marginal Price**

**\* \* \* \* \***

**B. LMP Composition in the Real-Time Market**

In each 15-minute interval and each 5-minute interval of the Fifteen Minute Market and Real-Time Dispatch, respectively, the CAISO calculates the LMP for each PNode, based on the Bids of sellers and buyers selected in those markets as specified in the FMM Schedule and 5-minute Real-Time Dispatch Instructions. The CAISO designates a Reference Bus, *r*, for calculation of the System Marginal Energy Cost (*SMECr*), which is the shadow price of the system power balance constraint. The CAISO uses the distributed load in the EIM Area as the Reference Bus to calculate loss sensitivities and shift factors used to linearize the power balance and Transmission Constraints. Resources that have constraints that prevent them from being marginal are not eligible to set the Locational Marginal Price. For each bus other than the Reference Bus, the CAISO determines separate components of the LMP for the marginal cost of Energy, Marginal Cost of Congestion, Marginal Cost of Losses, and Marginal Greenhouse Gas Cost relative to the Reference Bus, consistent with the following equation:

*LMPi* = *SMECr* + *MCCi* + *MCLi* + *MCGi*

*LMPi* = *SMECr*

where:

* *MCGi* is the LMP component representing the Marginal Greenhouse Gas Cost.

For each PNode within an EIM Entity Balancing Authority Area, the LMP shall include a fourth component, the Marginal Greenhouse Gas Cost.

**\* \* \* \* \***

**F. Marginal Greenhouse Gas Cost Component Calculation**

For EIM Participating Resources within an EIM Entity Balancing Authority Area and Energy imported to or exported from an EIM Entity Balancing Authority Area, the CAISO will include the Marginal Greenhouse Gas Cost in dispatching Energy from the relevant EIM Participating Resources to serve load in the CAISO Balancing Authority Area. The CAISO will allocate the Net Imbalance Energy Export optimally to EIM Participating Resources. This allocation does not depend on the location of the EIM Entity Participating Resource; *i.e.* the CAISO does not use a shift factor in the allocation. If the Net Imbalance Energy Export from all EIM Entity Balancing Authority Areas as a group is negative or zero, there is no associated Net Imbalance Energy Export allocation or Marginal Greenhouse Gas Cost. Otherwise the Net Imbalance Energy Export constraint is binding with a Shadow Price (ψ). The market-clearing process produces a Shadow Price for the Net Imbalance Energy Export constraint only when the relaxation of the constraint would result in reduction in the total cost to operate the system. The CAISO determines the Marginal Greenhouse Gas Cost component of the LMP at a PNode in an EIM Entity Balancing Authority Area and LMPs for imports and exports between that EIM Entity Balancing Authority Area and a non-EIM Balancing Authority Area as the negative of the Shadow Price of the Net Imbalance Energy Export constraint.

*MCGi* = ψ

**\* \* \* \* \***