



California Independent  
System Operator Corporation

June 23, 2016

The Honorable Kimberly D. Bose  
Secretary  
Federal Energy Regulatory Commission  
888 First Street, NE  
Washington, DC 20426

**Re: California Independent System Operator Corporation  
Docket No. ER16-1085**

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) submits this filing to comply with the Commission's order accepting, subject to condition, tariff revisions to facilitate participation of aggregations of distribution-connected or "distributed" energy resources in the CAISO's energy and ancillary services markets.<sup>1</sup> The CAISO requests that the Commission accept this filing in compliance with the Commission's June 2 Order.

## **I. Introduction**

On March 4, 2016, the CAISO submitted tariff revisions to establish an initial framework to enable aggregations of energy resources connected to distribution systems<sup>2</sup> within the CAISO's balancing authority area to participate in its energy and ancillary services markets. The CAISO's proposed framework recognizes distributed energy resource aggregations as a new type of market resource similar to a generating facility. The proposed framework also recognizes a distributed energy resource provider as the owner or operator of the aggregation.

Under the CAISO's proposed framework, distributed energy resource aggregations may operate at a single pricing node or across multiple pricing nodes. Under either approach, the resource must provide a net response at the

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<sup>1</sup> *Cal. Indep. Sys. Operator Corp.*, 155 FERC ¶ 61,229 (2016) (June 2 Order). The CAISO submits this filing pursuant to Section 205 of the Federal Power Act, 16 U.S.C. § 824d, and Section 35.13 of the Commission's regulations, 18 C.F.R. § 35.13.

<sup>2</sup> The CAISO tariff defines the term distribution system to mean "the distribution assets of an IOU or Local Publicly Owned Electric Utility."

pricing node level that is consistent with the CAISO's dispatch instructions and, in the case of aggregations across multiple pricing nodes, consistent with applicable generation distribution factors that the resource submits with its bid.<sup>3</sup>

Under the CAISO's framework, a scheduling coordinator for a distributed energy resource aggregation will submit schedules and bids for an aggregation based on the aggregation's generation distribution factors. The CAISO's market awards and dispatch instructions will then reflect these distribution factors that correlate to individual pricing nodes. Scheduling coordinators will submit aggregated meter data to the CAISO and the CAISO will settle the resource's response at the level of the aggregation based on a weighted locational marginal price associated with each pricing node. If meter data reflects that a distributed energy resource aggregation did not accurately respond to its dispatch instructions, the resource will face financial consequences in the form of uninstructed imbalance energy charges.

## **II. The Commission's June 2 Order**

In response to the CAISO's tariff filing, Pacific Gas and Electric Company filed comments recommending in part that the Commission direct the CAISO to modify its tariff provisions to include its pricing methodology for distributed energy resource aggregations. The CAISO agreed to make tariff changes on compliance to clarify that it will settle distributed energy resource aggregations at the applicable pricing node level. On June 2, 2016, the Commission accepted the CAISO's proposed tariff revisions subject to condition. Specifically, the Commission directed that the CAISO to revise its tariff to include the following:

“(1) language stating that CAISO will impose uninstructed imbalance energy charges on a DER Provider who fails to follow a dispatch instruction and (2) its pricing methodology for both single and multiple node aggregations.”<sup>4</sup>

## **III. Tariff revisions to comply with Commission's June 2 Order**

The existing CAISO tariff contains several provisions that will inform the settlement of Distributed Energy Resource Aggregations. The settlement principles set forth in Section 11.1 of the CAISO tariff provide in part that the CAISO will settle day-ahead schedules at the relevant locational marginal price

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<sup>3</sup> See CAISO tariff section 4.17.6.

<sup>4</sup> June 2 Order at P 64.

and the CAISO will settle dispatch instructions at real-time prices.<sup>5</sup> These provisions generally apply to all market resources.

In order to comply with the Commission's June 2 Order, the CAISO proposes to revise the tariff to clarify the pricing methodology for distributed energy resource aggregations using both a single pricing node and distributed energy resource aggregations using multiple pricing nodes. The revisions also clarify that the CAISO will impose uninstructed imbalance energy charges on a distributed energy resource aggregation when that aggregation does not follow a dispatch instruction consistent with its generation distribution factors.

Specifically, the CAISO proposes to add language to tariff section 11.2.1.1 to include distributed energy resource aggregations in the list of resources that will receive a locational marginal price at the applicable pricing node or aggregated pricing node for its day-ahead energy schedule. The CAISO's existing tariff relating to real-time market prices already applies generally to all resources.<sup>6</sup> The CAISO also proposes to add language to 11.5.2 to include distributed energy resource aggregations in the list of resources subject to uninstructed imbalance energy settlements. Finally, the CAISO proposes to add a new section 11.6.4 governing the settlement of distributed energy resource aggregations to state the following:

Settlements for Energy provided by a Distributed Energy Resource Provider from a Distributed Energy Resource Aggregation shall be based on the applicable PNode or Aggregated PNode of the Distributed Energy Resource Aggregation. For Distributed Energy Resource Aggregations comprising a single PNode, settlement for Energy transactions would reflect the LMP at that PNode. For Distributed Energy Resource Aggregations comprising multiple PNodes settlement for Energy transactions would be the weighted average LMP of the PNode(s) based on the applicable Generation Distribution Factors submitted through the Distributed Energy Resource Aggregation's Bid or as registered in the Master File. Consistent with the provisions of Section 11.5.2 the CAISO will impose UIE on a Distributed Energy Resource Provider if the Distributed Energy Resource Provider's Distributed Energy Resource Aggregation does not follow a Dispatch Instruction.

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<sup>5</sup> CASIO tariff, section 11.1(e). *See also*, CAISO sections 11.2 (Settlement of Day-Ahead Market Transactions) and 11.5 (Real-Time Market Settlements).

<sup>6</sup> *See generally* section 11.5.

Consistent with the June 2 Order, this new language states that the CAISO will impose uninstructed imbalance energy charges on distributed energy resource aggregations that do not follow a dispatch instruction. The new language also clarifies the pricing methodology for distributed energy resource aggregations both at single and multiple pricing nodes. In Attachments A and B to this filing, the CAISO has provided its proposed tariff changes in both clean and redline formats.

#### **IV. Conclusion**

The CAISO requests that the Commission accept the tariff revisions contained in this filing without modification and in full compliance with the Commission's June 2 Order. Please contact the undersigned if you have any questions regarding this matter.

Dated: June 23, 2016

Respectfully submitted,

/s/ Andrew Ulmer

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## CERTIFICATE OF SERVICE

I certify that I have served the foregoing document upon the parties listed on the official service list in the captioned proceedings, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, California this 23<sup>rd</sup> day of June, 2016.

/s/ Martha Sedgley  
Martha Sedgley

**Attachment A – Clean Tariff Records**

**Tariff Amendments to Enhance  
Local Market Power Mitigation Procedures**

**California Independent System Operator Corporation**

#### **11.2.1.1 IFM Payments For Supply of Energy**

For each Settlement Period for which the CAISO clears Energy transactions in the IFM, the CAISO shall pay the relevant Scheduling Coordinator for the MWh quantity of Supply of Energy from all Generating Units, Participating Loads, Proxy Demand Resources, Reliability Demand Response Resources, Distributed Energy Resource Aggregations and System Resources in an amount equal to the IFM LMP at the applicable PNode or Aggregated PNode multiplied by the MWh quantity specified in the Day-Ahead Schedule for Supply (which consists of the Day-Ahead Scheduled Energy).

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#### **11.5.2 Uninstructed Imbalance Energy**

Scheduling Coordinators shall be paid or charged a UIE Settlement Amount for each LAP, PNode or Scheduling Point for which the CAISO calculates a UIE quantity for each Settlement Interval. UIE quantities are calculated for each resource that has a Day-Ahead Schedule, Dispatch Instruction, Real-Time Interchange Export Schedule or Metered Quantity. For MSS Operators electing gross Settlement, regardless of whether that entity has elected to follow its Load or to participate in RUC, the UIE for such entities is settled similarly to how UIE for non-MSS entities is settled as provided in this Section 11.5.2. The CAISO shall account for UIE every five minutes based on the resource's Dispatch Instruction. For all resources, including Generating Units, System Units of MSS Operators that have elected gross Settlement, Physical Scheduling Plants, System Resources, Distributed Energy Resource Aggregations and all Participating Load, Reliability Demand Response Resources, and Proxy Demand Resources, the UIE Settlement Amount is calculated for each Settlement Interval as the product of its UIE MWh quantity and the applicable RTD LMP. The UIE Settlement Amount for non-Participating Load and MSS Demand under gross Settlement is settled as described in Section 11.5.2.2. For MSS Operators that have elected net Settlement, the UIE Settlement Amount is calculated for each Settlement Interval as the product of its UIE quantity and its Real-Time Settlement Interval MSS Price.

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## **11.6 PDRs, RDRRs or Distributed Energy Resource Aggregations**

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### **11.6.4 Settlement of Distributed Energy Resource Aggregations**

Settlements for Energy provided by a Distributed Energy Resource Provider from a Distributed Energy Resource Aggregation shall be based on the applicable PNode or Aggregated PNode of the Distributed Energy Resource Aggregation. For Distributed Energy Resource Aggregations comprising a single PNode, settlement for Energy transactions would reflect the LMP at that PNode. For Distributed Energy Resource Aggregations comprising multiple PNodes settlement for Energy transactions would be the weighted average LMP of the PNode(s) based on the applicable Generation Distribution Factors submitted through the Distributed Energy Resource Aggregation's Bid or as registered in the Master File. Consistent with the provisions of Section 11.5.2, the CAISO will impose UIE on a Distributed Energy Resource Provider if the Distributed Energy Resource Provider's Distributed Energy Resource Aggregation does not follow a Dispatch Instruction.

**Attachment B – Marked Tariff Records**

**Filing in Compliance with June 2, 2016 Order-  
Distributed Energy Resource Provider**

**California Independent System Operator Corporation**

### 11.2.1.1 IFM Payments For Supply of Energy

For each Settlement Period for which the CAISO clears Energy transactions in the IFM, the CAISO shall pay the relevant Scheduling Coordinator for the MWh quantity of Supply of Energy from all Generating Units, Participating Loads, Proxy Demand Resources, Reliability Demand Response Resources, [Distributed Energy Resource Aggregations](#) and System Resources in an amount equal to the IFM LMP at the applicable PNode [or Aggregated PNode](#) multiplied by the MWh quantity specified in the Day-Ahead Schedule for Supply (which consists of the Day-Ahead Scheduled Energy).

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### 11.5.2 Uninstructed Imbalance Energy

Scheduling Coordinators shall be paid or charged a UIE Settlement Amount for each LAP, PNode or Scheduling Point for which the CAISO calculates a UIE quantity for each Settlement Interval. UIE quantities are calculated for each resource that has a Day-Ahead Schedule, Dispatch Instruction, Real-Time Interchange Export Schedule or Metered Quantity. For MSS Operators electing gross Settlement, regardless of whether that entity has elected to follow its Load or to participate in RUC, the UIE for such entities is settled similarly to how UIE for non-MSS entities is settled as provided in this Section 11.5.2. The CAISO shall account for UIE every five minutes based on the resource's Dispatch Instruction. For all resources, including Generating Units, System Units of MSS Operators that have elected gross Settlement, Physical Scheduling Plants, System Resources, [Distributed Energy Resource Aggregations](#) and all Participating Load, Reliability Demand Response Resources, and Proxy Demand Resources, the UIE Settlement Amount is calculated for each Settlement Interval as the product of its UIE MWh quantity and the applicable RTD LMP. The UIE Settlement Amount for non-Participating Load and MSS Demand under gross Settlement is settled as described in Section 11.5.2.2. For MSS Operators that have elected net Settlement, the UIE Settlement Amount is calculated for each Settlement Interval as the product of its UIE quantity and its Real-Time Settlement Interval MSS Price.

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**11.6 Settlement of Transactions Involving PDRs, or RDRRs or Distributed Energy Resource Aggregations**

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**11.6.4 Settlement of Distributed Energy Resource Aggregations**

Settlements for Energy provided by a Distributed Energy Resource Provider from a Distributed Energy Resource Aggregation shall be based on the applicable PNode or Aggregated PNode of the Distributed Energy Resource Aggregation. For Distributed Energy Resource Aggregations comprising a single PNode, settlement for Energy transactions would reflect the LMP at that PNode. For Distributed Energy Resource Aggregations comprising multiple PNodes settlement for Energy transactions would be the weighted average LMP of the PNode(s) based on the applicable Generation Distribution Factors submitted through the Distributed Energy Resource Aggregation's Bid or as registered in the Master File. Consistent with the provisions of Section 11.5.2, the CAISO will impose UIE on a Distributed Energy Resource Provider if the Distributed Energy Resource Provider's Distributed Energy Resource Aggregation does not follow a Dispatch Instruction.