



California Independent  
System Operator Corporation

March 4, 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-\_\_\_\_\_-000  
Distributed Energy Resource Provider Initiative**

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) submits this tariff filing 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 the tariff revisions contained in this filing within 90 days and make them effective on June 3, 2016.

## **I. Introduction**

Advancements in technologies and products are changing the way we generate, transmit and store energy and how consumers make choices about their energy uses and sources. These advancements provide opportunities to make the electric system more secure, sustainable, and competitive. The number and types of distributed energy resources are growing and represent an increasingly important and larger part of the future resource mix. Integrating these new, distributed resources will help lower carbon emissions and can offer operational benefits to the transmission system.

Currently, the CAISO tariff does not offer a clear platform or guidance for smaller distributed energy resources to participate effectively in CAISO markets. In light of the rapid changes and transformation occurring in the electric industry, the CAISO seeks to clarify and advance the CAISO tariff and business processes

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<sup>1</sup> 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. Capitalized terms not otherwise defined herein have the meanings set forth in Appendix A to the CAISO tariff.

to support the participation of distributed energy resources in the CAISO markets. For instance, in order for traditional supply resources to participate in the CAISO markets, they must meet the CAISO's minimum size requirement of 0.5 MW. This same requirement applies to distributed energy resources that wish to participate in the CAISO's markets. However, unlike traditional supply resources, individual distributed energy resources may be too small to meet the minimum size requirement. The aggregation of multiple distributed energy resources can overcome this challenge.

The proposed tariff revisions 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 framework will accommodate various resource types as well as different business models provided the aggregation is capable of operating as an integrated resource and meets specific technical requirements. For instance, the framework could facilitate wholesale market participation by micro-grids interconnected to distribution systems, third party aggregators operating distributed energy resources, or a utility distribution company operating these resources. The CAISO stresses that this is only a first step and, as such, comes with some limitations discussed herein. Given that, the CAISO proposes to rely on existing market models and tariff rules to the maximum extent possible. At the request of stakeholders, the CAISO has adopted prudent and reasonable limitations and protections, as well as proactive monitoring mechanisms, to gain experience with initial aggregations, ensure that all aggregations are consistent with applicable rules and tariffs at both the retail and wholesale levels, ensure reliability, and guard against any adverse consequences. As the CAISO gains operational experience with distributed energy resource aggregations, it will be able to consider future refinements and enhancements.

In 2013, the CAISO undertook an effort to refine its technical and business rules addressing revenue metering and telemetry requirements specifically to lower barriers for entities seeking to operate smaller resources in the CAISO's energy and ancillary services markets. Among other enhancements, these changes expanded the use of lower cost communication networks to transmit telemetry and meter data to the CAISO.<sup>3</sup> Based on discussions with stakeholders in its on-going policy development process, the CAISO recognized that additional opportunities exist to facilitate participation by greater numbers of

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<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."

<sup>3</sup> See Draft Final Proposal, Expanding Metering and Telemetry Options Phase 2 – Distributed Energy Resource Provider, dated June 10, 2015 at 9.10.  
[http://www.caiso.com/Documents/DraftFinalProposal\\_ExpandedMetering\\_TelemetryOptionsPhase2\\_DistributedEnergyResourceProvider.pdf](http://www.caiso.com/Documents/DraftFinalProposal_ExpandedMetering_TelemetryOptionsPhase2_DistributedEnergyResourceProvider.pdf)

distributed energy resources in the wholesale market to increase competition and enhance the reliable operation of the CAISO grid. The CAISO initiated a second phase of its initiative to explore additional mechanisms to enhance participation from distributed energy resources mechanisms, which resulted in the tariff revisions proposed in this filing.

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. The distributed energy resource provider can elect to contract with or become a scheduling coordinator itself to participate in the CAISO markets. Working through its scheduling coordinator, the distributed energy resource provider will have the unique ability to determine how to disaggregate CAISO dispatch instructions to the individual distributed energy resources that comprise the aggregation to comply with the CAISO's instructions. The distributed energy resource provider will also need to interface with utility distribution company or metered subsystem that operates the distribution system in the CAISO balancing authority area to which resources in its aggregation are connected.

The CAISO anticipates continuing to work with stakeholders, especially utility distribution companies and metered subsystems, to implement its proposed tariff revisions. In some cases, established processes exist to facilitate the interconnection and operation of distributed energy resources for purposes of participation in the CAISO's markets. For instance, under wholesale distribution access tariffs, utility distribution companies have a process to interconnect distributed energy resources and provide wholesale distribution service to export power to the CAISO grid. However, utility distribution companies and metered subsystems may need to develop new processes or refine existing processes to accommodate distributed energy resource aggregations. Utilities may need to re-examine state jurisdictional tariffs for interconnecting resources or accommodating the interconnection and operation of resources using emerging technologies that are located behind a customer's meter. The CAISO's proposal will not interfere with or dictate the outcome of such efforts. Rather, the CAISO's proposal only serves to facilitate the participation of aggregations of distributed energy resources in the CAISO's markets that are compatible with the safe and reliable operation of distribution system.

The CAISO's proposed framework also will serve as a foundation to explore other market rules that may govern the interface between the transmission grid and resources interconnected at the distribution level. The CAISO and its stakeholders will continue to examine the need to refine these rules and will coordinate with local regulatory authorities such as the California Public Utilities Commission (CPUC) to ensure orderly participation in the CAISO's markets by resources interconnected to a distribution system. The

CAISO is encouraged by the support it received from CPUC Commissioners to pursue this framework.<sup>4</sup> The Commission should accept these tariff amendments as just and reasonable given the proposed revisions afford appropriate protections to the distribution system while enabling the integration of a more diverse and distributed energy supply mix into the CAISO markets.

## **II. Proposed Tariff Amendments**

In this section, the CAISO describes its proposed tariff revisions. The revisions encompass five general categories:

- (A) Provisions that recognize a distributed energy resource provider as a market participant;
- (B) Provisions that recognize a distributed energy resource aggregation as a market resource;
- (C) Rules governing participation by these resources in the CAISO's markets;
- (D) Distinctions between the requirements for scheduling coordinators representing demand response providers and scheduling coordinators representing distributed energy resource providers; and
- (E) A new *pro forma* distributed energy resource provider agreement.

The CAISO has attached a matrix of proposed tariff revisions with this filing to explain and justify each proposed tariff change.

### **A. The CAISO's tariff revisions recognize a distributed energy resource provider as a new type of market participant**

The CAISO is proposing several new terms in its tariff through this filing, including distributed energy resource, distributed energy resource aggregation, and distributed energy resource provider.<sup>5</sup> The CAISO proposal recognizes the

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<sup>4</sup> See December 1, 2015 letter from CPUC President Michael Picker and CPUC Commissioner Michael Peter Florio to CAISO Board of Governors supporting CAISO's distributed energy resource provider framework [http://www.caiso.com/Documents/PublicComment-CPUC\\_LetterRegardingDistributedEnergyResourcesProviderProposal-Dec1\\_2015.pdf](http://www.caiso.com/Documents/PublicComment-CPUC_LetterRegardingDistributedEnergyResourcesProviderProposal-Dec1_2015.pdf)

<sup>5</sup> See proposed defined terms included in Appendix A to the CAISO tariff, Master Definitions and Supplement.

owner or operator of a distributed energy resource aggregation as the distributed energy resource provider. The CAISO will allow a distributed energy resource provider to aggregate one or more distributed energy resources for purposes of wholesale market participation. Like all other market participants, a distributed energy resource provider may only participate in the CAISO's markets through a scheduling coordinator.<sup>6</sup>

The CAISO proposes to define a distributed energy resource as any resource with a first point of interconnection to a utility distribution company or a metered subsystem. This broad definition encompasses multiple types of resources within the CAISO's balancing authority area interconnected to the distribution system. Examples of distributed energy resources could include, but are not limited to, distributed generation, energy storage, and plug-in electric vehicle charging stations. These resources could be in front of or behind a customer meter. Using this broad definition will avoid the possibility of inadvertently excluding resource types from participating in an aggregation.<sup>7</sup> At the same time, where appropriate, the CAISO also proposes rules that will make certain distributed energy resources ineligible to participate.

Table A reflects the resources that the CAISO proposes to allow distributed energy resource providers to aggregate as well as resources that would be ineligible to participate in a distributed energy resource aggregation.

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<sup>6</sup> See proposed tariff section 14.17.1.

<sup>7</sup> Demand response that participates in the CAISO market as proxy demand resource and reliability demand response resource are distinct resource types and are not included here as a type of distributed energy resource that can be part of a distributed energy resource aggregation. The existing proxy demand resource and reliability demand response resource program already provides for market participation of aggregated demand response resources using a baseline methodology to measure performance. The framework the CAISO is proposing in this filing will accommodate market participation by aggregated distributed energy resources that are directly measured and do not rely on a baseline to measure performance.

**Table A –Eligibility to Join a Distributed Energy Resource Aggregation**

<b>Resource Type</b>	<b>Eligibility</b>	<b>Tariff Rule</b>
Resource connected to a distribution system or metered subsystem	Yes	Proposed revisions to Appendix A of the CAISO tariff
Generating Unit 1 MW or greater	No	Existing CAISO tariff section 4.6.3.2
Proxy Demand Resource or Reliability Demand Response Resource	No	Proposed revision to CAISO tariff section 4.13.1
Resource participating in a retail net energy metering program	No	Proposed revision to CAISO tariff sections 4.17.3(d)

As the Commission is aware, distribution connected resources already participate in the CAISO’s markets. In some cases, these resources are participating generators; in some cases, they are proxy demand resources or reliability demand response resources. The tariff revisions proposed in this filing do not change those arrangements. Instead, the CAISO is extending the same opportunity to support the reliable operation of the transmission system to aggregations of distribution-connected resources, recognizing the significant transformation in the industry and deployment of emerging technologies.

Individual generating units located in the CAISO balancing authority that are 1 MW or greater will still be required to become participating generators and will not be eligible to aggregate their capacity through a distributed energy resource provider.<sup>8</sup> Generating units that are between 0.5 MW and 1 MW that elect to become participating generators will also not be eligible to be part of a distributed energy resource aggregation unless their owners/operators decide to

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<sup>8</sup> See definition of Participating Generator in Appendix A to the CAISO tariff, Master Definitions and Supplement.

A Generator or other seller of Energy or Ancillary Services through a Scheduling Coordinator over the CAISO Controlled Grid (1) from a Generating Unit with a rated capacity of 1 MW or greater, (2) from a Generating Unit with a rated capacity of from 500 kW up to 1 MW for which the Generator elects to be a Participating Generator, or (3) from a Generating Unit providing Ancillary Services or submitting Energy Bids through an aggregation arrangement approved by the CAISO, which has undertaken to be bound by the terms of the CAISO Tariff, in the case of a Generator through a Participating Generator Agreement, Net Scheduled PGA, or Pseudo-Tie Participating Generator Agreement.

terminate their participating generator agreements. Likewise, proxy demand resources or reliability demand response resources will continue to operate as curtailable demand subject to the market rules that currently apply to them.<sup>9</sup>

The CAISO's proposed tariff revisions recognize that currently resources that are participating in a retail net energy metering program cannot at the same time participate in a wholesale market aggregation.<sup>10</sup> This rule would extend to various aspects of retail net metering programs such as net metering with storage or virtual net metering. The rationale for this rule is that under California's current net energy metering program a participating resource already receives benefits from netting its excess energy against subsequent electricity bills.<sup>11</sup> Based on this netting approach, there is no energy available to offer into the CAISO markets since excess energy is banked for later withdrawal.<sup>12</sup> The CAISO also believes this initial approach is consistent with Commission orders determining that exports to the transmission grid under a net energy metering program do not constitute a sale for resale of electricity under the Federal Power Act because these customers are, on a net basis, consumers.<sup>13</sup> One stakeholder requested that the ISO prohibit distributed energy resources from participating in an aggregation if they also participate in a retail program that does not expressly authorize wholesale participation. However, this rule appears too broad and undefined. The CAISO tariff revisions will permit non-net energy metering distributed energy resources to participate in an aggregation as a wholesale market participant. However, as explained in Section IV.C., this participation will be subject to an opportunity for utility distribution companies or metered subsystems to identify and resolve any concerns regarding compliance with the utility's applicable tariff or requirements of the Local Regulatory Authority. This review will also address any concerns that the resource's participation in aggregation may pose a threat to the safe and reliable operation of their distribution systems. This measure fully protects utility distribution systems and metered subsystems and ensures that the CAISO proposal will not undermine distribution system operations.

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<sup>9</sup> See proposed change to CAISO tariff 4.13.1 to clarify that Reliability Demand Response Resources and Proxy Demand Resources may not participate in a Distributed Energy Resource Aggregation.

<sup>10</sup> See proposed CAISO tariff section 4.17.3(d).

<sup>11</sup> See *also* CPUC Decision 16-01-044 Decision Adopting Successor to Net Energy Metering Tariff at 12-16, describing overview of California's net energy metering program. <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M158/K285/158285436.pdf>

<sup>12</sup> See CAISO Comments on Track 2 Issues in CPUC Rulemaking 15-03-11 dated February 5, 2016 at 8-10. <http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=158180563>

<sup>13</sup> See *generally Sun Edison LLC*, 129 FERC ¶ 61,146 (2009) *reh'g granted*, 131 FERC ¶ 61,213 (2010); *MidAmerican Energy Co.* 94 FERC ¶ 61,340 (2001).

Under the CAISO's proposal, distributed energy resource aggregations will be scheduling coordinator metered entities, similar to proxy demand resources and reliability demand response resources. Scheduling coordinators for a distributed energy resource provider will need to enter into a meter service agreement for scheduling coordinators with the CAISO, if they have not already done so.<sup>14</sup> In contrast to CAISO metered entities, the CAISO will not directly poll the meters of distributed energy resources comprising an aggregation.<sup>15</sup> Instead, the CAISO will require the scheduling coordinator to provide settlement quality meter data to the CAISO. This approach is consistent with the treatment of demand response resources that also aggregate multiple resources on distribution systems and reduces the upfront infrastructure investment associated with having each distributed energy resource in an aggregation also become a CAISO metered entity.<sup>16</sup> Instead, the scheduling coordinator in coordination with the owner/operator of the aggregation, *i.e.*, the distributed energy resource provider, will be responsible for collecting and submitting this meter data.<sup>17</sup> Scheduling coordinators must submit settlement quality meter data to the CAISO for each settlement period in an operating day to permit the CAISO to settle any applicable charges or credits, such as uninstructed imbalance energy. In addition, scheduling coordinators will need to make meter information from individual distributed energy resources comprising a distributed energy resource aggregation available to the CAISO upon request. These rules will help ensure that the CAISO can appropriately issue settlement statements that reflect the aggregation's response to CAISO dispatch instructions and assess the accuracy of that response.

### **B. The CAISO's tariff revisions recognize a distributed energy resource aggregation as a market resource**

Under the CAISO's proposed tariff revisions, a distributed energy resource aggregation will become a new resource that participates in the CAISO energy and ancillary service markets. The CAISO proposes to define a distributed energy resource aggregation as a resource comprised of one or more distributed energy resources.<sup>18</sup> The CAISO will treat the aggregation, rather than the

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<sup>14</sup> See Appendix B.7 to the CAISO tariff.

<sup>15</sup> Under the CAISO's proposal, a distributed energy resource participating in an aggregation may not also participate in the CAISO Markets as a CAISO Metered Entity.

<sup>16</sup> See existing CAISO tariff section 10.3.2.1

<sup>17</sup> See proposed CAISO tariff section 4.17.5.2.

<sup>18</sup> See proposed definition for distributed energy resource aggregations in CAISO tariff, Appendix A, Master Definitions and Supplement.

individual distributed energy resources, as the market resource. This new resource accommodates smaller distributed-connected generation and emerging resource types that may need a different model for wholesale market participation.

The CAISO proposes a series of reasonable initial requirements for these resources to participate in the market to ensure the safe and reliable operation of the distribution system. As the CAISO obtains operational experience with distributed energy resource aggregations and as roles and responsibilities for managing the transmission/distribution interface continue to evolve, the CAISO may need to propose additional requirements.

Among other requirements, the CAISO proposes that a distributed energy resource may not participate in more than one distributed energy resource aggregation, and a distributed energy resource participating in a distributed energy resource aggregation may not participate as a resource in the CAISO market separate from the distributed energy resource aggregation.<sup>19</sup> These requirements are necessary to ensure the CAISO appropriately identifies the distinct and individual distributed energy resources that comprise a distributed energy resource aggregation, to prevent double counting or double enrollment, and to ensure the CAISO is not modeling distributed energy resources both as part of an aggregation and as a stand-alone resource.

In addition, the CAISO is proposing rules for distributed energy resource aggregations to ensure it can accurately model the congestion impacts of a distributed energy resource aggregation on the CAISO controlled grid. Distributed energy resource aggregations may consist of distributed energy resources at one pricing node or may span multiple pricing nodes.<sup>20</sup> Each distributed energy resource aggregation will be no smaller than 0.5 MW and each distributed energy resource aggregation that includes distributed energy resources located at different pricing nodes will be no larger than 20 MW.<sup>21</sup> These size limitations will help ensure that an aggregation is significantly large enough to have a measurable impact on the transmission system, and also will provide an upper size limit for aggregations that span across different pricing nodes. The CAISO selected the minimum size of an aggregation based on the minimum size of a generating unit (without an aggregation) to participate in the

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<sup>19</sup> See proposed tariff section 4.17.3 (a) and (b).

<sup>20</sup> A pricing node or "PNode" is a single network node or subset of network nodes where a physical injection or withdrawal is modeled and for which a locational marginal price is calculated and used for financial settlements. See Appendix A to CAISO tariff, Master Definitions and Supplement.

<sup>21</sup> See proposed CAISO tariff section 4.17.5.1.

CAISO markets.<sup>22</sup> The CAISO selected the upper limit for those aggregations that span multiple pricing nodes in order to limit the impact of these aggregations on congestion on the CAISO grid without severely constraining the ability of distributed energy resource providers to form viable aggregations.<sup>23</sup> The CAISO plans to examine whether it can relax this initial resource size limitation but first wants to gain operational experience with distributed energy resource aggregation of sufficient size (*i.e.*, between 10 and 20 MW) across multiple pricing nodes. Adopting an initial limit on the size of these aggregations is a prudent and appropriate means to ensure reliable operation of the transmission system while the CAISO obtains experience with the behavior of distributed energy resource aggregation operating at multiple pricing nodes.

The CAISO also proposes that each distributed energy resource aggregation must be located in a single sub-load aggregation point (Sub-LAP) to ensure that it does not create additional congestion on the CAISO controlled grid. Sub-LAPs were initially developed with the advent of congestion revenue rights to reflect major transmission constraints within each utility service territory (*i.e.*, within a default LAP).<sup>24</sup> In 2010, the CAISO applied this same requirement on demand response resource aggregations approved by the Commission to participate in the CAISO market – *i.e.*, proxy demand resources and reliability demand response resources – to ensure that the dispatch of demand response resource aggregations do not exacerbate congestion by allowing these aggregations to operate across congested interfaces. Thus, for these same reasons, the CAISO is proposing that distributed energy resource aggregations operate within single Sub-LAPs to avoid the possibility that they create additional congestion. Currently, the CAISO has twenty-three (23) Sub-LAPs. Figure 1 is a graphical illustration of the Sub-LAP boundaries and Sub-LAP names within the utility service territories (*i.e.*, the default LAPs) of Pacific Gas and Electric Company, Southern California Edison and San Diego Gas & Electric.

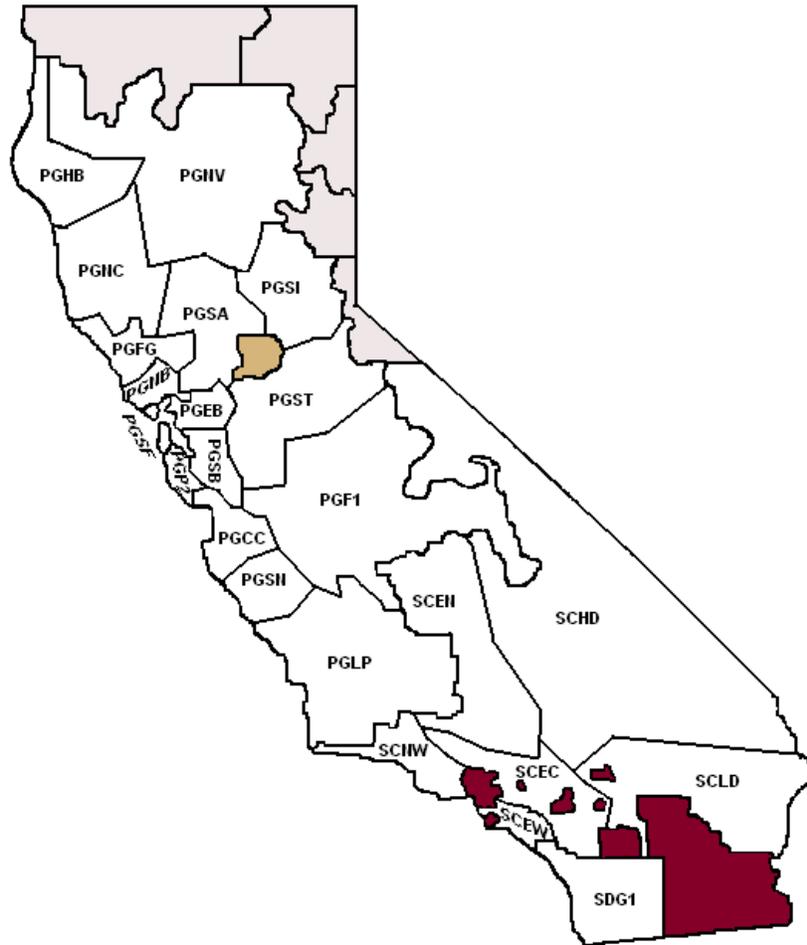
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<sup>22</sup> See CAISO tariff section 4.6.3.2.

<sup>23</sup> The CAISO believes 20 MW is a just and reasonable limit and is directionally consistent with ensuring it implements its framework gradually. 20 MW is also the limit the Commission established to allow resources to take advantage of the small generator interconnection procedures. *Standardization of Small Generator Interconnection Agreements and Procedures*, Order No. 2006, FERC Stats. & Regs. ¶ 31,180.

<sup>24</sup> A sub-LAP is a CAISO defined subset of pricing nodes within a default load aggregation point (default LAP). See Appendix A to CAISO tariff, Master Definitions and Supplement.

Figure 1



Limiting aggregations to Sub-LAP boundaries will ensure that a resource is not operating on both sides of a constraint and potentially exacerbating congestion by virtue of its own operation. For example, a distributed energy resource aggregation with sub-resources in two adjoining Sub-LAPs could find its sub-resources on both sides of a constraint identified by the CAISO's market processes. As a result, there is potential that a CAISO dispatch instruction to the distributed energy resource aggregation to alleviate a constraint between these two Sub-LAPs may actually exacerbate the problem.

### **C. The CAISO's tariff revisions establish rules for market participation by distributed energy resource aggregations**

The CAISO's proposed framework also includes market participation rules for distributed energy resource aggregations. As explained above, distributed energy resource aggregations may operate at a single pricing node or across multiple pricing nodes. Aggregations also may comprise different distributed energy resource types. Under either approach, the resource must provide a net response at the 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>25</sup> The CAISO is seeking a net response at the pricing node level rather than an individual distributed energy resource location in order to capture the value that the aggregation provides at the transmission-distribution interface.

Under the CAISO's proposed provisions, the scheduling coordinator will submit schedules and bids for an aggregation based on the aggregation's generation distribution factors. CAISO 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. Under the CAISO's initial design, the CAISO will not have the ability to impose uninstructed imbalance energy charges at individual pricing nodes unless the aggregation is located behind a single pricing node. In addition, under the initial design, if an aggregation operating across multiple pricing nodes fully responds to its dispatch instruction at the resource level but its response deviates from its distribution factors, the resource would face no uninstructed imbalance energy charges because the CAISO settles on meter data at the resource level, not the pricing node level. As explained in Section IV.B, to monitor a resource's response aligns with its distribution factors, the CAISO plans to sample meter data from distributed energy resource providers. Based on that review, the CAISO may propose enhancements to its initial framework for market participation by distributed energy resource aggregations.

The CAISO proposes that scheduling coordinators for distributed energy resource providers will submit bids similar to how they submit bids for other

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<sup>25</sup> See proposed CAISO tariff section 4.17.6.

CAISO market participants and their resources.<sup>26</sup> In addition, the CAISO has proposed tariff language to require that supply bids for distributed energy resource aggregations contain various bid components, as applicable.<sup>27</sup> For example, the CAISO is requiring scheduling coordinators to submit generation distribution factors with its bids.<sup>28</sup> If the scheduling coordinator does not submit generation distribution factors in its bids, the CAISO will use default generation distribution factors registered in the CAISO's Master File for that distributed energy resource aggregation.<sup>29</sup> This approach allows for scheduling coordinators to reflect the dynamic operating nature of some of the distributed energy resources comprising an aggregation. The approach also provides for a reasonable expectation of how the resource will perform across applicable pricing nodes in the event a scheduling coordinator does not submit generation distribution factors with its bid. To illustrate this requirement, the CAISO includes the following examples.

Example 1 reflects a distributed energy resource aggregation comprised of similar distributed energy resource types at three pricing nodes (P2, P6 and P8). In this example, the scheduling coordinator for the distributed energy resource aggregation submits a 1 MWh bid with distribution factors of 0.2 at P2, 0.5 at P6, and 0.3 at P8. The distributed energy resource aggregation's bid clears the market and the resource receives a CAISO dispatch instruction to provide 1 MWh. Consistent with its applicable generation distribution factors, the net response at each pricing node should be +0.2 MWh at P2, +0.5 MWh at P6, and +0.3 MWh at P8. In this example, the resource provided the expected response at P2 and P6 but provided no response at P8.

The CAISO will pay the resource based on the weighted average of the location marginal prices at each pricing node. The CAISO will only receive aggregated metered data for the resource and will not have disaggregated meter data to settle the resource at the weighted average of only those pricing nodes at which the resource provided a response. The aggregation, however, will incur

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<sup>26</sup> See CAISO section 30.5. At present, the CAISO has not implemented functionality to allow resources using its non-generator resource model to submit self-provisions of ancillary services. When the CAISO implements this functionality, it will be available for distributed energy resource aggregations as well.

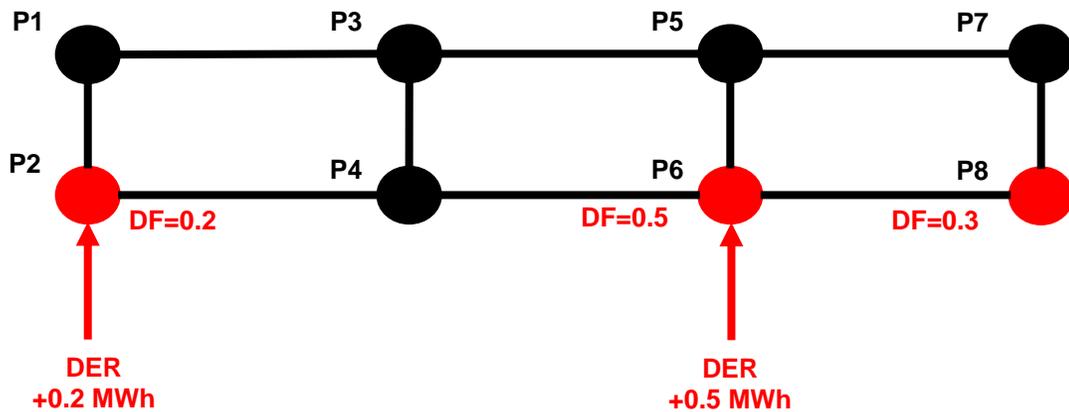
<sup>27</sup> See proposed CASIO tariff section 30.5.2.6 specifying applicable bid component such as Ramp Rate, Minimum and Maximum Operating Limits, Energy Limit, and Contingency Flag. These resources will not submit start-up or minimum load bids because the CAISO is not proposing to commit these resources or operate them at minimum load through its market processes.

<sup>28</sup> *Id.*

<sup>29</sup> *Id.*

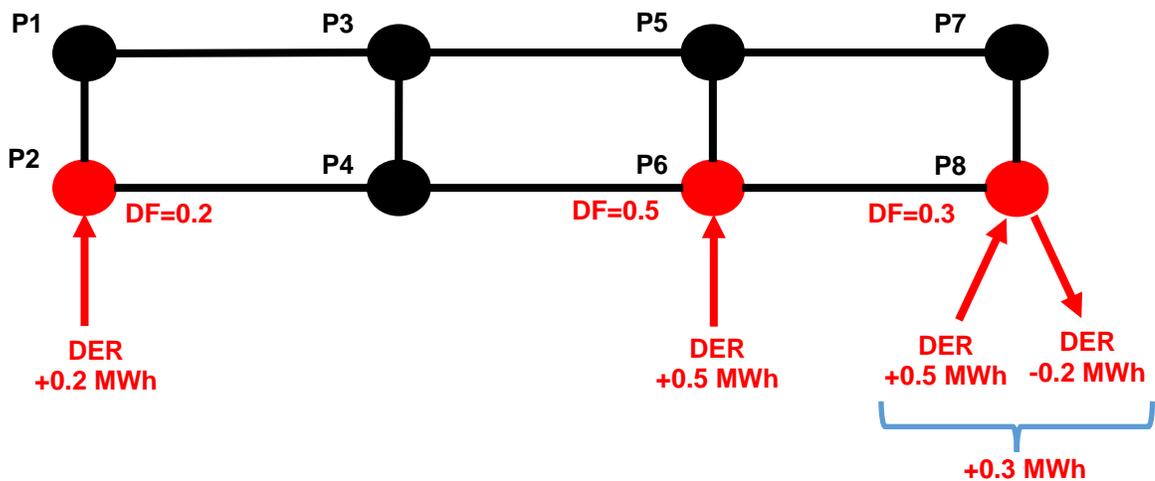
uninstructed imbalance energy charges for the portion of the dispatch instruction it did not provide.

**Example 1:**



Example 2 reflects the same assumptions as Example 1 except there are two different distributed energy resources participating in the aggregation at P3. These resources are also different resource types. Consistent with its applicable distribution factors, the net response at each pricing node should be +0.2 MWh at P2, +0.5 MWh at P6, and +0.3 MWh at P8. Although the two distributed energy resources at P8 move in opposite directions, the net response of the aggregation is consistent with the generation distribution factor at P8 of 0.3 (or 30 percent).

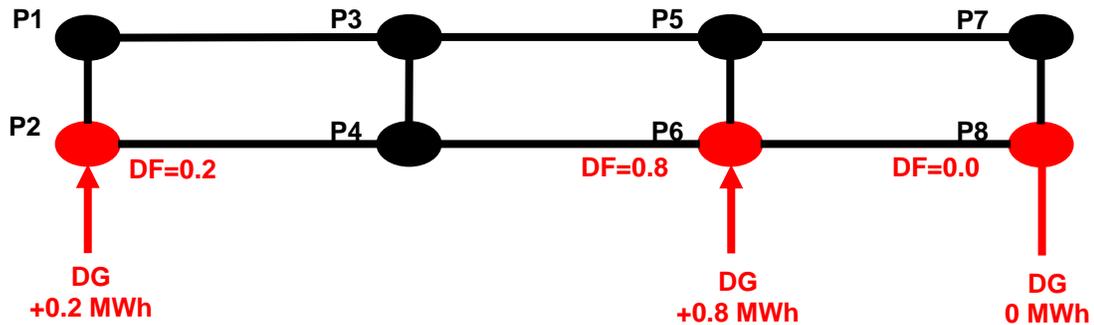
**Example 2**



Example 3 reflects a situation in which a scheduling coordinator for the distributed energy resource aggregation submits a 1 MWh bid. This situation is

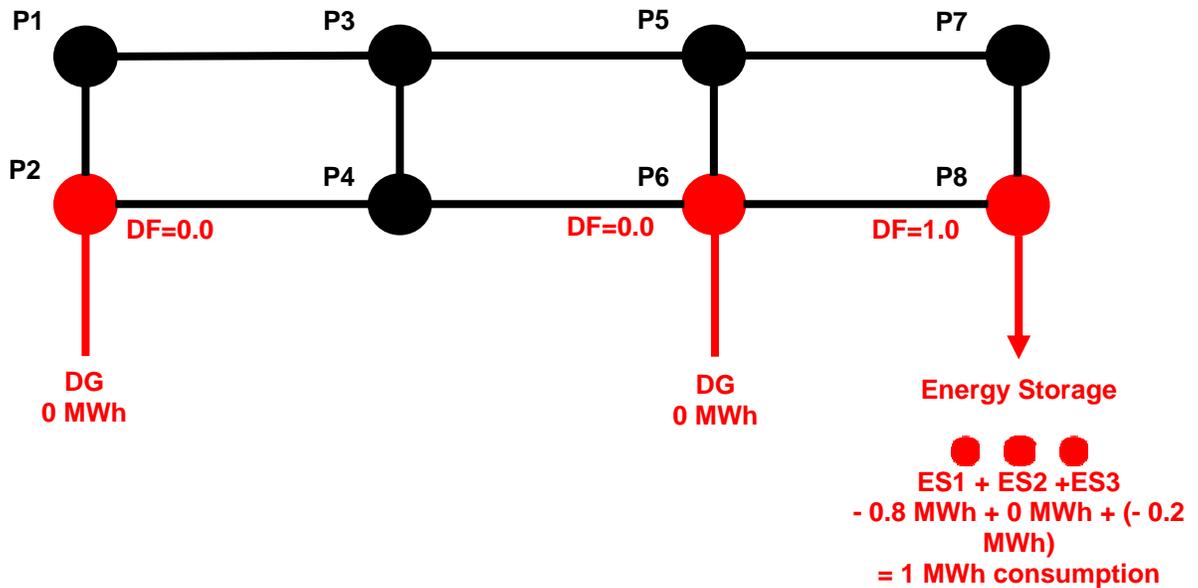
similar to Example 1 except there is a distribution level constraint that makes the distributed energy resource participating in the aggregation at P8 unavailable. The scheduling coordinator can still offer 1 MWh to the market but needs to update its generation distribution factors as part of its bid. Consistent with its new generation distribution factors, the net response at each pricing node should be +0.2 MWh at P2, +0.8 MWh at P6, and +0 MWh at P8.

### Example 3



Example 4 reflects a distributed energy resource aggregation with generation resources at P2 and P6, but the aggregation is now bidding to consume energy for charging storage resources at P8. The CAISO market clears the resource's bid to consume 1 MWh and issues the dispatch instruction. To provide a net response at its pricing nodes that is consistent with the CAISO dispatch instruction and applicable generation distribution factors means that the net response at P2 and P6 must be zero and the net response at P8 must be -1 MWh. Under the CAISO's proposal, there is no requirement that the storage sub-resources at P8 all operate in charging mode, nor that they all be moving in the same direction as the dispatch instruction, so long as the net response of all the storage sub-resources at P8 is -10 MWh.

#### Example 4



The CAISO also will apply metering and telemetry rules to distributed energy resource aggregations. Under the CAISO's proposal, distributed energy resource aggregations will be scheduling coordinator metered entities.<sup>30</sup> In contrast to CAISO metered entities, the CAISO does not directly poll the meters of scheduling coordinator metered entities. This is the case for demand response resources operating in the CAISO markets today. Scheduling coordinators for these resources collect the meter data for these resources and submit the validated data to the CAISO pursuant to settlement timelines set forth in the CAISO tariff.<sup>31</sup> Under the CAISO's proposal, distributed energy resources participating in a distributed energy resource aggregation will be metered directly. Unlike demand response, they may not use a baseline or other derived measurement for their performance evaluation.

With respect to telemetry – which allows resources offering energy or ancillary services to provide real-time data to the CAISO – the CAISO proposes to require distributed energy resource aggregations to adhere to the same standards as other resources. If a distributed energy resource aggregation has a rated capacity of 10 MW or greater or provides ancillary services, then it must provide real-time data through telemetry to the CAISO's energy management

<sup>30</sup> See proposed CAISO tariff section 4.17.3(f).

<sup>31</sup> See *generally* CAISO tariff section 10.3.6.

system in a manner similar to a participating generator.<sup>32</sup> In these cases, the CAISO will receive telemetry at the aggregate resource level, *i.e.*, not from the individual distributed energy resources comprising the aggregation nor, importantly, from the distinct pricing nodes at which a multiple pricing node aggregation contains individual resources. As the CAISO gains experience with these aggregations it may examine modifications to its telemetry requirements to reduce the size of resources at which these requirements apply or to impose requirements at the pricing node level for distributed energy resource aggregations.

As part of its operation of distributed energy resource aggregations, a distributed energy resource provider, through its scheduling coordinator, must adhere to CAISO dispatch instructions and operating orders.<sup>33</sup> The distributed energy resource providers must operate and maintain their distributed energy resource aggregations consistent with applicable provisions of the CAISO tariff, complying with applicable reliability criteria, and complying with applicable CAISO operating procedures and business practice manuals.<sup>34</sup> In addition, similar to participating generators interconnected to the distribution system that already participate in the CAISO markets, the CAISO is proposing that distributed energy resource providers comply with applicable utility distribution company tariffs and operating procedures incorporated into those tariffs as well as applicable requirements of the local regulatory authority (such as the CPUC or relevant municipal entity).<sup>35</sup>

The distributed energy resource provider also will have an obligation to operate its aggregation in a manner consistent with the limitations or operating orders established by the utility distribution company or metered subsystem.<sup>36</sup> Distributed energy resource providers will need to disaggregate dispatch instructions the CAISO sends to scheduling coordinators in a manner that is consistent with distribution system limitations. They will need to confer with the utility distribution company or metered subsystem on a periodic basis to ensure available distribution service exists to operate its resource consistent with its energy and ancillary services bids and awards. If a utility distribution company or metered subsystem removes facilities from service that affect the operation of a

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<sup>32</sup> *Id.* The CAISO's energy management system is a computer control system used by dispatchers to monitor the real-time performance of the various elements of an electric system and to control resources and transmission facilities.

<sup>33</sup> See proposed CAISO tariff section 4.17.6.

<sup>34</sup> Proposed tariff section 14.17.2.

<sup>35</sup> *Cf.* existing CAISO tariff section 4.6.3.1.

<sup>36</sup> See proposed tariff section 4.17.2 (e).

distributed energy resource aggregation, the CAISO tariff will require the scheduling coordinator for the distributed energy resource provider to submit relevant information to the CAISO outage management system.<sup>37</sup> Scheduling coordinators can also update the relevant generation distribution factors associated with the resource's bids. The measures all advance the goal of enabling aggregations to participate in the CAISO's markets in a manner similar to other resources but without jeopardizing the safe and reliable operation of the distribution system. Moreover, these responsibilities are similar to responsibilities the CAISO's existing tariff imposes on other market participants such as participating generators and demand response providers.<sup>38</sup>

During the CAISO stakeholder process, stakeholders raised questions about whether operational directives of the utility distribution company that may constrain an aggregation's participation in the CAISO's markets may give rise to liability to the distributed energy resource provider. Under the CAISO's framework, distributed energy resource aggregations will consist of distributed energy resources interconnected to the utility distribution company's system. The terms of interconnection service that utility distribution companies provide to those resources and the distributed energy resource provider who aggregates those resources will govern their liability, if any. With respect to participation in the CAISO's market, distributed energy resources will be subject to the CAISO's general tariff rules governing liability.<sup>39</sup>

The CAISO also proposes to require distributed energy resource providers to provide accurate information to the CAISO about distributed energy resources participating in its aggregation.<sup>40</sup> Under the CAISO's proposal, the distributed energy resource provider must provide the CAISO with information pertaining to the location, capacity, and operating characteristics of distributed energy resource aggregations so that the CAISO can appropriately model the resource in the CAISO's market model. The CAISO will require the distributed energy resource provider, through its scheduling coordinator, to provide meter data from distributed energy resources participating in its aggregation upon request. This information will allow the CAISO to assess whether distributed energy resource aggregations performed consistently with their generation distribution factors in response to CAISO dispatch instructions.<sup>41</sup> These market rules ensure the

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<sup>37</sup> See proposed tariff section 4.17.6.

<sup>38</sup> Cf. CAISO tariff sections 4.6 and 4.13.

<sup>39</sup> See proposed Appendix B.21 to the CAISO tariff, Distributed Energy Resource Provider Agreement, Article IX. See also CAISO tariff section 14.

<sup>40</sup> See proposed CAISO tariff section 4.17.4.

<sup>41</sup> See proposed CAISO tariff section 4.17.5.2.

CAISO will have access to data directly related to resources seeking to participate in its market.

Finally, the CAISO proposes to require a distributed energy resource provider to enter into a distributed energy resource provider agreement.<sup>42</sup> The CAISO proposes to use this agreement as the mechanism to ensure market participants have legally committed to adhere to the CAISO tariff and to establish other responsibilities between the parties.<sup>43</sup> The CAISO has included a proposed *pro forma* agreement as part of this filing, which is generally the same as the standard agreement that the CAISO asks other market participants to execute prior to participating in the CAISO's wholesale markets

**D. The CAISO's tariff revisions distinguish between requirements for scheduling coordinators representing demand response providers and scheduling coordinators representing distributed energy resource providers**

As part of developing tariff revisions to recognize that distributed energy resource providers will be scheduling coordinator metered entities, the CAISO proposes two minor revisions to tariff section 10.3 to differentiate the requirements that apply to demand response providers. These rules are different because demand response resources need to submit settlement quality meter data for the settlement interval in which they responded to a CAISO dispatch instruction. For distributed energy resource aggregations, the CAISO will require settlement quality meter data in every operating interval.

Specifically, the CAISO proposes revisions to tariff section 10.3.2.1.1 to distinguish between requirements for scheduling coordinators representing demand response providers and scheduling coordinators representing distributed energy resource providers. These changes reflect existing rules. Scheduling coordinators representing demand response providers must submit meter data that reflects (1) an accurate measure of the actual consumption of energy by each scheduling coordinator metered entity for each settlement period in which the ISO dispatches the resource; or (2) statistically derived meter data for such settlement periods, in cases where interval metering is not available. In contrast, scheduling coordinators representing distributed energy resource providers must submit an accurate measure of the actual production or consumption of energy by each distributed energy resource aggregation in all settlement periods.<sup>44</sup> The CAISO is requiring these scheduling coordinators provide settlement quality

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<sup>42</sup> See proposed CAISO tariff section 14.17.1.

<sup>43</sup> See *generally pro forma* agreements in Appendix B[?] of the CAISO tariff.

<sup>44</sup> See CAISO proposed tariff section 10.3.2.1.2.

meter data for every operating interval of the day, *i.e.*, 24 hours per day, 7 days per week.

**E. The CAISO's tariff revisions implement a new *pro forma* distributed energy resource provider agreement**

As referenced above, the CAISO proposes to establish a new *pro forma* contract that distributed energy resource providers must sign to participate in the CAISO markets.<sup>45</sup> This *pro forma* agreement will set forth the terms and conditions under which the CAISO and distributed energy resource providers will discharge their respective duties and responsibilities under the CAISO tariff. The proposed agreement, however, does not establish duties and responsibilities as between a utility distribution company and distributed energy resources, except in so far as it incorporates conditions of CAISO market participation such as operating distributed energy resources participating in an aggregation consistent with limitations or operating orders of a utility distribution company or metered subsystem. This requirement is similar to existing CAISO tariff provisions that require participating generators interconnected to a distribution system to comply with distribution requirements.<sup>46</sup> Similar to other *pro forma* agreements for entities participating in the CAISO markets, the proposed agreement contains articles that include standard contractual terms and conditions. The CAISO has identified these articles and provided justifications for each as part of Attachment E hereto.

The CAISO proposes to include in the agreement terms relating to a distributed energy resource provider's requirements for market participation, including the provision of technical and operational information to the CAISO, metering and communications requirements, and submission of economic bids for energy and ancillary services. The CAISO also proposes to incorporate other standard terms and conditions from its existing *pro forma* participating resource agreements that address issues such as penalties and sanctions, cost responsibility for fulfilling the terms of the agreement, dispute resolution, representations and warranties, liability, uncontrollable forces and other miscellaneous terms.

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<sup>45</sup> See proposed *pro forma* agreement between distributed energy resource provider and the CAISO to include in Appendix B of the CAISO tariff.

<sup>46</sup> See CAISO tariff section 4.6.3.1:

With regard to any Generating Unit directly connected to a Distribution System, a Participating Generator shall comply with applicable UDC tariffs, requirements of the Local Regulatory Authority, interconnection requirements and generation agreements. With regard to a Participating Generator's Generating Units directly connected to a Distribution System, the CAISO and the UDC or MSS, as applicable, will coordinate to develop procedures to avoid conflicting CAISO and UDC or MSS, as applicable, operational directives.

Similar to a participating generator agreement (that identifies the individual generation resources covered by the agreement), the CAISO proposes that a distributed energy resource provider agreement would identify each distributed energy resource comprising an aggregation subject to the agreement as part of a schedule. The CAISO expects that each distributed energy resource provider, regardless of how many aggregations it has under its operational control, will only execute a single agreement. Individual distributed energy resources comprising distributed energy resource aggregations would not enter into additional participation agreements such as a participating generator agreement or a participating load agreement. As explained above, individual distributed energy resources comprising an aggregation cannot participate in the CAISO markets separate from the aggregation. Distributed energy resource providers will have an obligation to maintain an accurate list of the resources that participate in its aggregation(s) under its control.

### **III. Distributed energy resource providers and distributed energy resource aggregations must comply with applicable, existing tariff provisions**

The CAISO tariff contains existing provisions that also will apply to distributed energy resource providers either directly or through their scheduling coordinators. For instance, distributed energy resource providers seeking to offer ancillary services will need to comply with technical requirements to do so.<sup>47</sup> General communications requirements set forth in the CAISO tariff will apply to scheduling coordinators representing distributed energy resource providers.<sup>48</sup> Creditworthiness requirements also will apply to scheduling coordinators for distributed energy resource providers as will provisions related to settlements and billing and dispute resolution procedures, by way of example.<sup>49</sup> The tariff provisions that apply to scheduling coordinator metered entities set forth in section 10.3 also will apply to scheduling coordinators representing distributed energy resource providers with some exceptions.<sup>50</sup> For example, existing tariff section 10.3.2.2 governing the format for settlement quality meter data submission will apply to scheduling coordinators for distributed energy resource

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<sup>47</sup> See generally CAISO tariff, section 8 and Appendix K to the CAISO tariff.

<sup>48</sup> See generally CAISO tariff section 6.

<sup>49</sup> See generally CAISO tariff sections 11, 12 and 13.

<sup>50</sup> See generally CAISO tariff section 10.3.

providers. In contrast, existing tariff section 10.3.4 requiring scheduling coordinators for demand response providers to obtain approval from local regulatory authorities for the use of load profiles will not apply to distributed energy resource providers because all distributed energy resources that comprise an aggregation must be separately metered.

Pursuant to existing tariff provisions, scheduling coordinators must ensure their meters or revenue measuring devices for each distributed energy resource participating in an aggregation meet the requirements of the appropriate local regulatory authority.<sup>51</sup> If, however, the relevant local regulatory authority has not prescribed any certification criteria for the metering facilities of distributed energy resource, scheduling coordinators must ensure their meters or revenue measuring devices meet the default requirements established by the CAISO.<sup>52</sup> These requirements will be set forth in the CAISO's business practice manual for metering and include both a set of metering characteristics and method for validating, estimating and editing data.<sup>53</sup>

In some cases, however, existing tariff provisions will not apply to distributed energy resource providers or their aggregations. For instance, at this time, the CAISO is not proposing to extend the meteorological data requirements that apply to eligible intermittent resources to distributed energy resources comprising an aggregation. Although distributed energy resource aggregations may include variable energy resources, the CAISO does not believe requiring these individual resources to collect and submit meteorological data is necessary at this time because this framework is only a first step to allow for aggregations of distributed energy resource to aggregate. To impose such a requirement could create an undue burden on individual distributed energy resources. These individual variable energy resources will be less than 1 MW. In addition, aggregations may consist of multiple distributed energy resource types in dispersed locations throughout a Sub-LAP. Meteorological data at the sub-resource level may not provide meaningful information about the operation of the aggregation. For now, the CAISO proposes to exclude distributed energy resource aggregations from the definition of eligible intermittent resources under the CAISO tariff. Instead, the CAISO believes distributed energy resource providers and their scheduling coordinators should be responsible for managing any production forecasts necessary to support the accuracy of their bids. Based on operational experience with aggregations, the CAISO may re-examine

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<sup>51</sup> CAISO tariff sections 10.3.9, 10.3.14.

<sup>52</sup> See proposed revisions to CAISO tariff section 10.3.9.

<sup>53</sup> See Proposed Revision Request 892 for changes to the CAISO's Business Practice Manual for Metering. <http://bpmcmint.aiso.com/pages/ViewPrr.aspx?IsDIg=1&PRRID=892>

meteorological requirements at the aggregation or pricing node level as a future refinement to this framework.

Additionally, at this time, the CAISO is not proposing to recognize distributed energy resource aggregations as resource adequacy resources.<sup>54</sup> For purposes of initial implementation of this framework, the CAISO proposes to treat distributed energy resource aggregations as if they have energy only deliverability status under the CAISO's resource adequacy rules.<sup>55</sup> During its stakeholder process, the CAISO did not discuss with stakeholders how distributed energy resource aggregations would qualify a resource adequacy resource and what counting rules might apply to these resources if the aggregation comprises multiple resource types. The CAISO currently has an annual process to identify MW quantities at specific nodes of the CAISO grid for assigning deliverability status to distributed generation facilities interconnected or seeking interconnection to the distribution system of a utility distribution company or a metered subsystem.<sup>56</sup> This process anticipates utility distribution companies and metered subsystems assigning identified deliverability status to distributed generation facilities. Prior to applying these rules to distributed energy resource aggregations or making appropriate changes to those rules, the CAISO believes additional stakeholder discussion and input is necessary on foundational issues involving how to set qualifying capacity values for distributed energy resource aggregations for resource adequacy purposes.

#### **IV. Stakeholder Process**

The CAISO started a stakeholder process in 2014 to examine opportunities to facilitate greater participation by distributed energy resources in the CAISO's markets. The CAISO held several stakeholder meetings and calls in 2015 that culminated with the CAISO Board of Governors authorizing the CAISO to make tariff changes to implement this framework in July 2015. During its work to develop tariff language, the CAISO identified policy refinements to remove some of the limitations it initially proposed to apply to distributed energy

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<sup>54</sup> Appendix A of the CAISO tariff defines a Resource Adequacy Resource as "A resource that is designated in a Supply Plan to provide Resource Adequacy Capacity. The criteria for determining the types of resources that are eligible to provide Qualifying Capacity may be established by the CPUC or other applicable Local Regulatory Authority and provided to the CAISO."

<sup>55</sup> The CAISO tariff defines *Energy-Only Deliverability Status* to mean "a condition elected by an Interconnection Customer for a Large Generating Facility interconnected with the CAISO Controlled Grid the result of which is that the Interconnection Customer is responsible only for the costs of Reliability Network Upgrades and is not responsible for the costs of Delivery Network Upgrades, but the Large Generating Facility will be deemed to have a Net Qualifying Capacity of zero, and, therefore, cannot be considered to be a Resource Adequacy Resource."

<sup>56</sup> See CAISO tariff 40.4.6.3.

resource aggregations. The CAISO, therefore, reopened its discussions with stakeholders and, in response to stakeholder input, proposed refinements to its initial proposal that the CAISO Board of Governors adopted in December 2015. As part of these refinements, the CAISO eliminated requirements that - for aggregations across multiple pricing nodes - all sub-resources that comprise a distributed energy resource aggregation must be homogenous and must move in the same direction as the CAISO dispatch instruction. The CAISO also eliminated a requirement that for energy storage aggregations across multiple pricing nodes all resources participating in the aggregation must operate in the same mode, *i.e.*, charging or discharging, but not a mix of the two, in response to a CAISO dispatch instruction. These changes provide greater flexibility to distributed energy resource providers seeking to develop aggregations. The CAISO also conducted a stakeholder process to draft the tariff revisions submitted in this filing.

Throughout these processes, the CAISO has received input from current and potential market participants. This input has helped refine the CAISO's proposal.<sup>57</sup> The CAISO addresses selected issues raised during its stakeholder processes below and discusses how it responded to these issues. Additional information regarding the CAISO's stakeholder process is available in the Board of Governors' materials included as attachments to this filing.

#### **A. The CAISO will account for the congestion impacts on the transmission grid of distributed energy resource aggregations**

During the development of this initiative, the CAISO and its stakeholders explored how the CAISO could facilitate the participation by distributed energy resources in the CAISO markets. Some stakeholders questioned the direction of this work on the grounds that distributed energy resources should not need to aggregate and submit bids into the CAISO's market. Instead, stakeholders suggested the ISO create a model that would permit distributed energy resources to respond to price signals on the transmission grid and modify load needs. If retail rates are able to be more dynamic and a better reflection of system conditions, this model could exist. The framework proposed in this filing, however, will have the benefit of increasing the mix of resources participating directly in the wholesale market to help balance supply and demand, and provide ancillary services. In addition, the framework will lead to increase the CAISO's visibility regarding the operation of resources interconnected on the distribution systems in the CAISO's balancing authority. By allowing aggregations to participate in the CAISO's market, the CAISO can model and price the

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<sup>57</sup> More information about the CAISO's stakeholder process supporting these tariff revisions is available on the CAISO's website:

<http://www.caiso.com/informed/Pages/StakeholderProcesses/ExpandingMetering-TelemetryOptions.aspx>

congestion management benefits that aggregations of distributed energy resource provide to the transmission system.

To achieve this objective, the CAISO proposes a structure in which it interacts with a single distributed energy resource provider through that provider's scheduling coordinator. Under these rules, the CAISO can allow the provider to aggregate a sufficient level of capacity to meet minimum resource size limits for participation in the CAISO markets and realize efficiencies that may otherwise create barriers to entry into the wholesale market. With sufficient information about individual distributed energy resources in an aggregation and an understanding of the aggregation's generation distribution factors, the CAISO can model the congestion impacts of the aggregation on the transmission grid and compensate the resource with a locational marginal price at the transmission–distribution interface, *i.e.*, the CAISO pricing node. The tariff rules submitted with this filing will permit the CAISO to do so.

**B. The CAISO will monitor whether distributed energy resource aggregations respond to CAISO dispatch instructions consistent with their generation distribution factors**

During the CAISO stakeholder process, some stakeholders raised concerns with how the CAISO will verify whether distributed energy resource aggregations perform consistent with their modeled attributes and generation distribution factors. First, the CAISO is establishing a tariff rule requiring that a distributed energy resource aggregation respond to CAISO dispatch instructions with a net response at applicable pricing node(s) consistent with applicable generation distribution factors. This rule places the obligation on the distributed energy resource provider and its scheduling coordinator to do so. Second, the CAISO proposes to require that distributed energy resource providers make settlement quality meter data from individual distributed energy resources comprising an aggregation available to the CAISO upon request. This data will permit the CAISO to validate that distributed energy resources are performing as anticipated by reviewing meter data of individual sub resources to determine if it matches the expected response at the applicable pricing node.

At its December 17, 2015 Board of Governor's meeting, the CAISO committed that it will sample this data and compare it to CAISO dispatch instructions and applicable generation distribution factors and provide periodic reports to stakeholders on any findings. For aggregations of 10 MW or greater and for those as small as 1 MW providing ancillary services, the ISO will know in real-time whether the aggregation's response is consistent with dispatch instructions at the resource level. If observed variations occur, this fact may support requesting additional meter data reflecting the performance of individual sub-resources in an aggregation. For purposes of initiating the CAISO's proposed framework, these measures provide an adequate means to assess

whether distributed energy resource aggregations respond to dispatch instructions consistent with their generation distribution factors. Based on actual experience, if variations exist between dispatch instructions and how distributed energy resources actually respond, the CAISO may propose refinements to tariff rules governing distributed energy resource aggregations.

**C. The CAISO's tariff revisions will ensure distributed energy resource aggregations do not pose a threat to the safe the reliable operation of distribution systems.**

During the CAISO's stakeholder process, some stakeholders argued that the CAISO should provide utility distribution companies or metered subsystems with day-ahead schedules and real time dispatch instructions for distributed energy resource aggregations. The CAISO proposes tariff rules that require the CAISO to coordinate with the applicable utility distribution company or metered subsystem to avoid conflicting operational directives.<sup>58</sup> This coordination may include sharing dispatch instructions or other information as necessary. Until entities develop actual operating experience, the CAISO and operators of distribution systems will need some flexibility in assessing what information may be necessary to share to ensure safe and reliable operations. The CAISO also proposes tariff rules that require a distributed energy resource provider to operate their aggregations consistent with limiting or operating orders of the utility distribution company or metered subsystem.

Some stakeholders argued that the CAISO should restrict participation to only resources that interconnect to the distribution system using a wholesale access distribution tariff. While many in front of the meter distributed energy resources may use the wholesale distribution access tariff interconnection process as a means to interconnect and participate in the CAISO's market through an aggregation, the CAISO's framework may also extend to behind the meter resources. If a utility distribution company needs to assess whether operation of a distributed energy resource poses a threat to the safe and reliable operation of the distribution system, the CAISO has structured a mechanism to consult with the utility prior to the distributed energy resource participating in an aggregation. Similar to the Commission-approved demand response provider registration process, the CAISO proposes an opportunity for utility distribution companies and metered subsystems to raise concerns with distributed energy resources that seek to join a distributed energy resource aggregation. These up-front reviews will help assess whether an individual distributed energy resource participating in an aggregation can operate in response to CAISO dispatch instructions without posing a threat to the distribution system.

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<sup>58</sup> See proposed CAISO tariff section 14.17.2(f).

As described below, the CAISO's proposed rules for upfront screening of potential impacts to distribution systems and ongoing interaction with utility distribution companies and metered subsystems will help ensure the safe and reliable operation of distribution systems within the CAISO balancing authority area. Like all new market resources, distributed energy resource aggregations must go through a new resource implementation process at the CAISO.<sup>59</sup> As part of this process, the CAISO proposes to provide notice to the applicable utility distribution company or metered subsystem and request comment on specific issues associated with the distributed energy resource participating in the aggregation as a CAISO market resource. While the CAISO will undertake its own diligence to ensure the accuracy of information provided, the CAISO will also provide the utility distribution company or metered subsystem 30 days to raise concerns regarding the accuracy of the information about distributed energy resources in a proposed aggregation or raise one of the following concerns

- (1) the distributed energy resource is participating in another distributed energy resource aggregation;
- (2) the distributed energy resource is participating as a proxy demand response resource or a reliability demand response resource;
- (3) the distributed energy resource is participating in a retail net energy metering that does not expressly permit wholesale market participation;
- (4) the distributed energy resource is not in compliance with applicable utility distribution company/metered subsystem tariffs or applicable requirements of the local regulatory authority; or
- (5) the distributed energy resource may pose a threat to the safe and reliable operation of the distribution system, if operated as part of a distributed energy resource aggregation.<sup>60</sup>

These criteria will help ensure that the CAISO can avoid a situation in which the CAISO might dispatch a distributed energy resource aggregation that includes resources already participating in a demand response program, for example. The criteria also avoid a situation in which a resource could receive a retail rate credit for its output under a net energy metering program and also sell

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<sup>59</sup> See proposed CAISO tariff section 4.17.4. More information about the CAISO's new resource implementation process is available at the following website:  
<http://www.caiso.com/participate/Pages/NewResourceImplementation/Default.aspx>

<sup>60</sup> See proposed CAISO tariff section 4.17.4.

the same output to obtain a wholesale market payment. Without rules that expressly allow for the use of this energy for wholesale market purposes and appropriate credit/payment adjustments, the CAISO believes it is not just and reasonable to permit these resources to participate in a distributed energy resource aggregation. Finally, these rules permit a utility distribution company or metered subsystem to raise concerns regarding compliance with its tariffs and local regulatory authority requirements as well as the potential impact of a distributed energy resource to the safe and reliable operation of its distribution system that require resolution before a distributed energy resource can participate in an aggregation. The CAISO expects that in the overwhelming majority of cases, operators of distribution systems will have performed reliability screens as part of providing interconnection service to distributed energy resources. Nevertheless, the CAISO believes it is important to confirm that no concerns exist during its new resource implementation process.

The CAISO is not proposing that the utility resolve the concern within 30 days, but only that it identify the potential impact so that the concern can be assessed and resolved. Based on this tariff language, the CAISO will develop specific procedures in the context of its business practice manuals for distributed energy resource aggregations to complete the new resource implementation and add resources to its aggregation(s). One stakeholder requested that the CAISO require a utility distribution company or metered subsystem provide a written certification that it has no concerns with the operation of a particular distributed energy resource aggregation. The CAISO's procedures will include specific steps to ensure operators of distribution systems document that they do not have concerns with a distributed energy resource participating in an aggregation and provide that documentation to the CAISO.

If the utility distribution company or metered subsystem identify concerns based on the listed criteria, the CAISO will ask the distributed energy resource provider to resolve those concerns with the utility distribution company/metered subsystem or through the appropriate governmental authority before the distributed energy resource may participate in an aggregation. This approach is similar to the Commission-approved registration process the CAISO undertakes under its tariff for proxy demand resources and reliability demand response resources.<sup>61</sup> The CAISO believes this process will allow the utility distribution company and distributed energy resource provider to identify any interconnection or operational constraints that exist and resolve them prior to distributed energy resources participating in an aggregation as a CAISO market participant. To the extent a distributed energy resource provider seeks to augment its aggregation with new distributed energy resources, the CAISO will undertake a similar process. These steps will promote a gradual deployment of distributed energy

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<sup>61</sup> See CAISO tariff section 4.13.2.

resource aggregations in manner that protects the safe and reliable operation of distribution systems.

Moreover, the CAISO's proposal recognizes that distributed energy resource providers must comply with applicable utility distribution company tariffs and operating procedures incorporated therein as well as applicable requirements of the local regulatory authority.<sup>62</sup> The CAISO also proposes that each distributed energy resource provider must ensure that distributed energy resources that comprise a distributed energy resource aggregation under its control comply with applicable utility distribution company tariffs and operating procedures incorporated therein as well as applicable requirements of the local regulatory authority.<sup>63</sup> These rules demand that distributed energy resource providers adhere to whatever utility distribution company tariff applies of its own force and effect as a condition of CAISO market participation. These rules also allow distribution companies subject to regulatory approval to amend their tariffs as appropriate to ensure processes and rules exist to accommodate distributed energy resources seeking to aggregate and participate in the CAISO's wholesale markets while maintaining the safe and reliable operation of their distribution system.

Finally, a distributed energy resource provider will have an affirmative obligation to operate its distributed energy resource aggregation(s) in a manner consistent with limitations or operating orders established by the utility distribution company or metered subsystems.<sup>64</sup> Distributed energy resource providers will be required to submit resource-specific information into the CAISO's outage management system to reflect these limitations or constraints.<sup>65</sup> This will help ensure the CAISO's market systems do not issue infeasible day-ahead schedules or dispatch instructions to a distributed energy resource aggregation. In summary, the CAISO's proposal allows an aggregation of distributed energy resources to participate in the CAISO's markets, while respecting the applicable authority of state and local regulatory authorities and ensuring the safe and reliable operation of the distribution system.

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<sup>62</sup> See proposed CAISO tariff section 4.17.2(b).

<sup>63</sup> *Id.*

<sup>64</sup> See proposed CAISO tariff section 4.17.2(e).

<sup>65</sup> *Id.* at section 4.17.6.

**D. Establishing a framework for distributed energy resource aggregation to participate in the CAISO's markets will help identify and resolve issues that may exist at the transmission and distribution interface.**

Stakeholders have raised concerns that the CAISO is moving too rapidly to develop its framework for allowing distributed energy resource aggregations to participate in its markets. These parties have argued that business models and regulatory issues involving distributed energy resources are evolving and the CAISO needs to coordinate its efforts with these evolving issues. The CAISO, however, believes initiating this framework is a necessary first step and in no way prejudices or prevents the adoption of new business models or utility rules. The CAISO's proposal is a straightforward means to permit aggregations of smaller distributed energy resources to participate in the wholesale market while ensuring the safe and reliable operation of the distribution system.

The CAISO fully intends to work with affected parties to identify the roles and responsibilities of different entities at the transmission distribution interface. The CAISO expects this work will involve multiple parties. A fundamental aspect of the CAISO's framework proposed in this filing is that it is scalable and can accommodate different business models. The framework can support one distributed energy resource operated by a non-utility distributed energy resource provider. In addition, the framework can support a distribution service operator that also serves as a distributed energy resource provider and operates and controls hundreds or even many thousands of resources interconnected to its distribution system.

The Commission should recognize that the framework, as proposed, would help isolate specific issues involving coordination of the transmission-distribution interface because affected parties will gain actual operational experience with that coordination. Again, the CAISO's proposal contains significant protections to ensure that a distributed energy resource aggregation cannot go forward absent compliance with all applicable tariffs and state and local regulatory rules, and resolution of any safety or reliability concerns on the distribution systems.

The CAISO also is participating in CPUC proceedings addressing distributed energy resources, which include how to facilitate wholesale market participation by distributed energy resources. The CAISO will continue to do so with the aim of how best to integrate increasing levels of distributed energy resources in its balancing authority area. Among other proceedings involving distributed energy resources, the CPUC has initiated the following:

- **CPUC Rulemaking 14-08-013 - *Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769.***  
The California Legislature has mandated that investor-owned electric utilities file with the CPUC electric distribution resources plans that identify optimal locations for the deployment of Distributed Energy Resources and evaluate the safety, reliability and cost-effectiveness of those resources. The CPUC is using Rulemaking 14-08-013 to provide guidance for the development of utility distribution resource plans and to coordinate the CPUC's related work in other proceedings. The CPUC will review the utilities' plans, and authorize any expenditures to implement the plans, in the utilities' general rate cases.<sup>66</sup>
  
- **CPUC Rulemaking 14-10-003 – *Rulemaking to Create a Consistent Regulatory Framework for the Guidance, Planning, and Evaluation of Integrated Demand Side Resource Programs.*** In this proceeding, the CPUC is examining the integration of distributed energy resources in manner that provides optimal customer and grid benefits, while enabling California to reach its climate objectives. The CPUC is considering how best to source the distributed energy resources needed by the utilities based on the determinations made in Rulemaking 14-08-013. Following public workshops and extensive comments from parties, the CPUC expanded the scope to consider these issues for all distribution-connected resources on both sides of the customer meter.<sup>67</sup>
  
- **CPUC Rulemaking 15-03-11 - *Rulemaking to consider policy and implementation refinements to the Energy Storage Procurement Framework and Design Program and related Action Plan of the California Energy Storage Roadmap (Track 2).*** In 2013, the CPUC authorized an energy storage procurement

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<sup>66</sup> See February 6, 2015 assigned Commissioner's Ruling on guidance for Public Utilities Code 769 – Discretion Resource Planning:  
<http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=146374514>

<sup>67</sup> See January 5, 2015 Joint Assigned Commissioner's and Administrative Law Judge's Ruling and Scoping Memo:  
<http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=143990275>

See *also* February 26, 2016 Joint Assigned Commissioner's and Administrative Law Judge's Ruling and Scoping Memo broadening the scope of issues to include, among others, utility role, business models, and financial interests with respect to distributed energy resources deployment. <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M158/K886/158886810.PDF>

target of 1,325 megawatts, and allocated that target to each of the investor-owned utilities, with installations required no later than the end of 2024. In track 2 of this rulemaking, the CPUC is considering various issues for the continued development and refinement of its energy storage procurement framework and program design. These issues include increasing the procurement target, revising the eligibility criteria under the target, and considering how to accommodate multiple use applications for energy storage resources seeking to offer services to both the distribution and transmission grid. Multiple use application issues include the potential overlap of retail and wholesale revenue streams, adequacy of existing interconnection and metering requirements, and dispatch coordination and prioritization.<sup>68</sup>

The CAISO acknowledges that the business plans and regulatory policies are evolving with respect to distributed energy resources. The CAISO's proposal allows these policies to develop, does not interfere with them, and does not seek to usurp the authority of state and local regulatory authorities with respect to distribution system matters. Again, the CAISO's proposal has specific support from individual CPUC Commissioners overseeing this policy development.

By gaining experience with distributed energy resources seeking to aggregate, the CAISO and affected parties will gain experience with interconnection, multiple use business cases and integrating distributed energy resources into transmission system operations. However, as business models and regulatory policies develop, the CAISO expects they also will inform additional CAISO market rule enhancements for distributed energy resource aggregations.

**E. The CAISO proposal does not affect any option a resource may have to obtain a standard contract or tariff that complies with Public Utility Regulatory Policies Act of 1978 (PURPA)**

During the CAISO's stakeholder process, one party raised concerns that the CAISO's proposed framework fails to provide customer-owned generation a mechanism to timely transition to a standard contract or tariff that complies with avoided cost payments under PURPA. The CAISO's proposal does nothing of the kind. The CPUC's September 20, 2007 and December 10, 2012 decisions

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<sup>68</sup> See January 5, 2016 Assigned Commissioner and Assigned Administrative Law Judge's Scoping Memo and Ruling:  
<http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=157541764>

set forth contracting options available to qualifying facilities (QFs).<sup>69</sup> These contracts determine how QFs will be compensated by buyers even though this decision also required QFs to comply with the CAISO tariff once their legacy PURPA contracts terminated.

## V. Effective Date

The CAISO requests that the Commission make the tariff revisions contained in this filing effective June 3, 2016 to give the ISO sufficient time to work with prospective distributed energy resource providers and scheduling coordinators to make the framework by these new tariff provisions to distributed energy resource aggregations later this year.

## VI. Communications

Please provide communications regarding this filing to the following individuals, whose names should appear on the official service list established by the Commission with respect to this submittal:

Anthony Ivancovich\*  
Deputy General Counsel  
California Independent System  
Operator Corporation  
250 Outcropping Way  
Folsom, CA 95630  
Tel: (916) 608-7135  
Fax: (916) 608-7222  
[aivancovich@caiso.com](mailto:aivancovich@caiso.com)

Andrew Ulmer\*  
Director, Federal Regulatory Affairs  
California Independent System  
Operator Corporation  
250 Outcropping Way  
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Tel: (916) 608-7209  
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[aulmer@caiso.com](mailto:aulmer@caiso.com)

\* Individuals designated for service pursuant to Rule 203(b)(3),  
18 C.F.R. § 385.203(b)(3).

## VII. Service

The CAISO has served copies of this transmittal letter, and all attachments, on the CPUC, the California Energy Commission, and all parties with effective scheduling coordinator service agreements under the CAISO tariff. In addition, the CAISO is posting this transmittal letter and all attachments on its public website.

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<sup>69</sup> See *Opinion on Future Policy and Pricing for Qualifying Facilities*, D. 07-09-040 (2007). On December 12, 2010, the CPUC approved the QF global settlement, which included several contract options, one of which is a PURPA contract for QF less than 20 MWs. *Decision Adopting Proposed Settlement*, D. 10-12-035 (2010). Finally, pursuant to Order 688, the Commission has determined that the mandatory purchase obligation under PURPA is now limited to QFs of less than 20 MW. *Pacific Gas & Elec., et al.*, 135 FERC ¶ 61,234 (2011).

## **VIII. Attachments**

The following attachments, in addition to this transmittal letter, support the instant filing:

Attachment A	Clean CAISO tariff sheets that incorporate the proposed changes described above
Attachment B	Marked CAISO tariff sheets that show the proposed changes described above
Attachment C	July 2015 Board of Governors' Materials
Attachment D	December 2015 Board of Governors' Materials
Attachment E	Matrix of tariff revisions and justifications.

## **IX. Conclusion**

The CAISO requests that the Commission accept the proposed tariff revisions without modification. These amendments will advance a framework for distributed energy resources to participate in the CAISO's markets through aggregations. Once implemented, the CAISO's proposed revisions will also help advance efforts to examine how to manage responsibilities at the transmission-distribution interface. While continued work and coordination with other entities in this area remains necessary, the framework the CAISO is proposing is a just

The Honorable Kimberly D. Bose  
March 4, 2016  
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and reasonable step to facilitate distributed energy resources' participation in wholesale markets.

Please contact the undersigned if you have any questions regarding this matter.

Dated: March 4, 2016

Respectfully submitted,

/s/ Andrew Ulmer  
Roger E. Collanton  
General Counsel  
Anthony Ivancovich  
Deputy General Counsel  
Andrew Ulmer  
Director, Federal Regulatory Affairs  
The California Independent System  
Operator Corporation  
250 Outcropping Way  
Folsom, CA 95630  
Tel: (916) 608-7209  
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[aulmer@caiso.com](mailto:aulmer@caiso.com)

## 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 4<sup>th</sup> day of March, 2016.

/s/ Martha Sedgley  
Martha Sedgley

**Attachment A – Clean Tariff Records**

**Distributed Energy Resource Provider Initiative  
California Independent System Operator Corporation**

#### **4. Roles And Responsibilities**

#### **4.1 [NOT USED]**

#### **4.2 Market Participant Responsibilities**

##### **4.2.1 Comply With Dispatch Instructions And Operating Orders**

With respect to this Section 4.2, all Market Participants, including Scheduling Coordinators, Utility Distribution Companies, Participating Transmission Owners, Participating Generators, Participating Loads, Demand Response Providers, Distributed Energy Resource Providers, Balancing Authorities (to the extent the agreement between the Balancing Authority and the CAISO so provides), and MSS Operators within the CAISO Balancing Authority Area and all System Resources shall comply fully and promptly with the Dispatch Instructions and operating orders, unless such operation would impair public health or safety. A Market Participant is not required to comply with a CAISO operating order if it is physically impossible for the Market Participant to perform in compliance with that operating order. Shedding Load for a System Emergency does not constitute impairment to public health or safety. The Market Participant shall immediately notify the CAISO of its inability to perform in compliance with the operating order.

\* \* \* \*

#### **4.13 DRPs, RDRRs, and PDRs**

##### **4.13.1 Relationship Between CAISO and DRPs**

The CAISO shall only accept Bids for Energy from Reliability Demand Response Resources, and shall only accept Bids for Energy or Ancillary Services from Proxy Demand Resources, Submissions to Self-Provide Ancillary Services from Proxy Demand Resources, or submissions of Energy Self-Schedules from Proxy Demand Resources that have provided Submissions to Self-Provide Ancillary Services, if such Reliability Demand Response Resources or Proxy Demand Resources are represented by a Demand Response Provider that has entered into a Demand Response Provider Agreement with the CAISO, has accurately provided the information required in the Demand Response System, has satisfied all Reliability Demand Response Resource or Proxy Demand Resource registration requirements, and has met standards adopted

by the CAISO and published on the CAISO Website. Reliability Demand Response Resources and Proxy Demand Resources may not participate in a Distributed Energy Resource Aggregation. The CAISO shall not accept submitted Bids for Energy or Ancillary Services from a Demand Response Provider other than through a Scheduling Coordinator, which Scheduling Coordinator may be the Demand Response Provider itself or another entity.

\* \* \* \*

#### **4.17 Distributed Energy Resource Aggregations**

##### **4.17.1 CAISO Relationship with Distributed Energy Resource Providers**

The CAISO will accept Bids for Energy or Ancillary Services from Distributed Energy Resource Aggregations or submissions of Energy Self-Schedules from Distributed Energy Resource Aggregations, only if such Distributed Energy Resource Aggregations are represented by a Distributed Energy Resource Provider that has entered into a Distributed Energy Resource Provider Agreement with the CAISO to comply with all applicable provisions of the CAISO Tariff as they may be amended from time to time. The CAISO will not accept Bids for Energy or Ancillary Services from a Distributed Energy Resource Aggregation other than through a Scheduling Coordinator. The Scheduling Coordinator may be the Distributed Energy Resource Provider itself or another entity.

##### **4.17.2 Responsibilities of Distributed Energy Resource Providers**

The following general responsibilities apply to Distributed Energy Resource Providers:

- (a) Each Distributed Energy Resource Provider will operate and maintain its Distributed Energy Resource Aggregations consistent with applicable provisions of the CAISO Tariff.
- (b) Each Distributed Energy Resource Provider will comply with applicable Utility Distribution Company or Metered Subsystem tariffs and operating procedures incorporated therein as well as applicable requirements of the Local Regulatory Authority, if any. Each Distributed Energy Resource Provider will ensure that Distributed Energy Resources that comprise a Distributed Energy Resource

Aggregation under its control comply with applicable Utility Distribution Company or Metered Subsystem tariffs and operating procedures incorporated therein as well as applicable requirements of the Local Regulatory Authority, if any.

- (c) Each Distributed Energy Resource Provider will comply with Applicable Reliability Criteria to the extent they apply.
- (d) Each Distributed Energy Resource Provider will operate and maintain its Distributed Energy Resource Aggregation(s) consistent with applicable Operating Procedures and Business Practice Manuals established by the CAISO.
- (e) Each Distributed Energy Resource Provider will operate its Distributed Energy Resource Aggregation(s) in a manner consistent with limitations established by or operating orders of the Utility Distribution Company or Metered Subsystem.
- (f) The CAISO will coordinate with the applicable Utility Distribution Company or Metered subsystem to avoid conflicting operational directives, which may include but is not limited to sharing Dispatch Instructions.

#### **4.17.3 Requirements for Distributed Energy Resource Aggregations**

The following requirements apply to Distributed Energy Resource Aggregations:

- (a) A Distributed Energy Resource Aggregation will consist of one (1) or more Distributed Energy Resources.
- (b) A Distributed Energy Resource may not participate in more than one Distributed Energy Resource Aggregation.
- (c) A Distributed Energy Resource participating in a Distributed Energy Resource Aggregation may not participate as a resource in the CAISO Market separate from the Distributed Energy Resource Aggregation.
- (d) A Distributed Energy Resource participating in a Distributed Energy Resource Aggregation may not also participate in a retail net energy metering program that does not expressly permit wholesale market participation.

- (e) Each Distributed Energy Resource Aggregation must be located in a single Sub-LAP.
- (f) A Distributed Energy Resource Aggregation must provide a net response at its PNode(s) within its sub-LAP that is consistent with CAISO Dispatch Instructions and applicable Generation Distribution Factors submitted through the Distributed Energy Resource Aggregation's Bid or as registered in the Master File.
- (g) Distributed Energy Resource Aggregations are Scheduling Coordinator Metered Entities. Scheduling Coordinators for a Distributed Energy Resource Aggregation must have entered into a Scheduling Coordinator Metering Agreement with the CAISO. A Distributed Energy Resource participating in a Distributed Energy Resource Aggregation may not also participate in the CAISO Markets as a CAISO Metered Entity.

#### **4.17.4 Identification of Distributed Energy Resources**

Each Distributed Energy Resource Provider will provide information, as described in the Business Practice Manual, identifying each of its Distributed Energy Resource Aggregations and such information regarding the location, capacity, operating characteristics and applicable Generation Distribution Factors of its Distributed Energy Resource Aggregation(s) as may be reasonably requested from time to time by the CAISO. All information provided to the CAISO by a Distributed Energy Resource Provider regarding the operational and technical characteristics of its Distributed Energy Resource Aggregation(s) must be accurate.

As further described in the Business Practice Manual, the CAISO will confer with the applicable Utility Distribution Company or Metered Subsystem regarding information provided about Distributed Energy Resources comprising a Distributed Energy Resource Aggregation(s). The Utility Distribution Company or Metered Subsystem will have an opportunity to provide written comments within thirty (30) days regarding the accuracy of the information about Distributed Energy Resources comprising a Distributed Energy Resource Aggregation(s) or raise concerns

with respect to whether the Distributed Energy Resources (1) are participating in another Distributed Energy Resource Aggregation; (2) are participating as a Proxy Demand Response resource or a Reliability Demand Response Resource; (3) are participating in a retail net energy metering program that does not expressly permit wholesale market participation; (4) do not comply with applicable Utility Distribution Company tariffs or requirements of the relevant Local Regulatory Authority; or (5) may pose a threat to the safe and reliable operation of the Distribution System, if operated as part of a Distributed Energy Resource Aggregation. If the Utility Distribution Company or Metered Subsystem raises concerns based on these factors, the Distributed Energy Resource Provider will resolve those concerns with the Utility Distribution Company or Metered Subsystem prior to the CAISO allowing the individual Distributed Energy Resource to participate in a Distributed Energy Resource Aggregation. Any disputes regarding these concerns shall be undertaken with the applicable Governmental Authority for the Utility Distribution Company or Metered Subsystem and shall not be arbitrated or in any way resolved through a CAISO dispute resolution mechanism.

#### **4.17.5 Characteristics of Distributed Energy Resource Aggregations**

##### **4.17.5.1 Size Limits**

A Distributed Energy Resource Aggregation will be no smaller than 0.5 MW. A Distributed Energy Resource Aggregation that includes Distributed Energy Resources located at different PNodes will be no larger than 20 MW.

##### **4.17.5.2 Metering and Telemetry**

Scheduling Coordinators shall submit to the CAISO Actual Settlement Quality Meter Data or Estimated Settlement Quality Meter Data for Distributed Energy Resource Aggregations they represent for each Settlement Period in an Operating Day. Distributed Energy Resources participating in a Distributed Energy Resource Aggregation will be directly metered pursuant to a meter that complies with any applicable Utility Distribution Company tariff and any standards of the relevant Local Regulatory Authority or, if no such tariff exists or no standards have been set

by that Local Regulatory Authority, the metering standards as further detailed in the CAISO's Business Practice Manual. Distributed Energy Resource Providers must make Settlement Quality Meter Data from individual Distributed Energy Resources comprising a Distributed Energy Resource Aggregation available to the CAISO upon request.

Distributed Energy Resource Providers shall provide information regarding Distributed Energy Resource Aggregation(s) with a rated capacity of 10 MW or greater or, if the Distributed Energy Resource Aggregation(s) provides Ancillary Services, through telemetry to the CAISO's EMS in accordance with the CAISO's standards for direct telemetry and consistent with the requirement for telemetry set forth in Section 7.6.1.

#### **4.17.6 Operating Requirements**

Distributed Energy Resource Aggregations will respond to CAISO Dispatch Instructions. The CAISO may dispatch a Distributed Energy Resource Aggregation to the extent the Distributed Energy Resource Aggregation bids or schedules Energy or Ancillary Services into the CAISO Markets and receives an award. The CAISO may also issue an Exceptional Dispatch Instruction for the Distributed Energy Resource Aggregation for reliability pursuant to Section 34.10.

Distributed Energy Resource Aggregations shall respond to Dispatch Instructions consistent with Generation Distribution Factors for the Distributed Energy Resource Aggregation.

Each Distributed Energy Resource Provider will operate its Distributed Energy Resource Aggregation(s) in a manner consistent with limitations or operating orders established by the Utility Distribution Company or Metered Subsystem. Scheduling Coordinators for Distributed Energy Resources Providers shall submit Outages to the CAISO as necessary to reflect any distribution constraints impacting Distributed Energy Resources that comprise a Distributed Energy Resource Aggregation under its control. The CAISO shall have the authority to coordinate and approve Outage schedules for the Distributed Energy Resource Aggregation(s) listed in a Distributed Energy Resource Provider Agreement, in accordance with the provisions of

\* \* \* \* \*

### **6.3 Communication Of Dispatch Instructions**

Normal verbal and electronic communication of Dispatch Instructions between the CAISO and Generators, Participating Loads, Distributed Energy Resource Providers, or Demand Response Providers will be via the relevant Scheduling Coordinator.

#### **6.3.1 SC Responsibility For Communications To Generator Or Load**

Each Scheduling Coordinator must immediately pass on to the Generator, Participating Load, Distributed Energy Resource Provider, or Demand Response Provider concerned any communication for the Generator, Participating Load, or Demand Response Provider which it receives from the CAISO.

Communication delays by the Scheduling Coordinator may result in Uninstructed Deviation Penalties or other adjustments pursuant to this CAISO Tariff. The CAISO may, with the prior permission of the Scheduling Coordinator concerned, communicate with and give Dispatch Instructions to the operators of Generating Units, Participating Loads, Distributed Energy Resource Providers, and to Demand Response Providers, directly without having to communicate through their appointed Scheduling Coordinator. In situations of deteriorating system conditions or emergency, the CAISO reserves the right to communicate directly with the Generator(s), Distributed Energy Resource Providers, and Demand Response Providers as required to ensure System Reliability.

\* \* \* \* \*

### **10.3.2 Responsibilities Of Scheduling Coordinators And The CAISO**

#### **10.3.2.1 Duty to Provide Settlement Quality Meter Data**

Scheduling Coordinators shall be responsible for: (i) the collection of Meter Data for the Scheduling Coordinator Metered Entities it represents; (ii) the provision of Settlement Quality Meter Data to the CAISO; and (iii) ensuring that the Settlement Quality Meter Data supplied to the CAISO meets the requirements of Section 10. Scheduling Coordinators shall provide the CAISO with Settlement Quality Meter Data for all Scheduling Coordinator Metered Entities served by the Scheduling Coordinator no later than the day specified in Section 10.3.6 or the day specified in Section 10.3.6.4, as applicable. Settlement Quality Meter Data for these Scheduling Coordinator

Metered Entities shall be an accurate measure of the actual production or consumption of Energy by each Scheduling Coordinator Metered Entity in each Settlement Period.

#### **10.3.2.1.1 Requirements for SCs Representing Demand Response Providers**

Each Scheduling Coordinator for a Demand Response Provider shall aggregate the Settlement Quality Meter Data of the underlying Proxy Demand Resource or Reliability Demand Response Resource to the level of the registration configuration of the Proxy Demand Resource or Reliability Demand Response Resource in the Demand Response System. Settlement Quality Meter Data for these Scheduling Coordinator Metered Entities shall be either (1) an accurate measure of the actual consumption of Energy by each Scheduling Coordinator Metered Entity in each Settlement Period; or (2) statistically derived meter data pursuant to Section 10.1.7.

#### **10.3.2.1.2 Requirements for SCs Representing Distributed Energy Resource**

##### **Aggregations**

Each Scheduling Coordinator for a Distributed Energy Resource Aggregation shall aggregate the Settlement Quality Meter Data of the underlying Distributed Energy Resources to the level of the Distributed Energy Resources Aggregation provided in the Distributed Energy Resource Provider Agreement. Settlement Quality Meter Data for these Scheduling Coordinator Metered Entities shall be an accurate measure of the actual production or consumption of Energy by each Distributed Energy Resource that comprises a Distributed Energy Resource Aggregation in each Settlement Period. Scheduling Coordinators shall retain Settlement Quality Meter Data of each Distributed Energy Resource comprising a Distributed Energy Resource Aggregation for a period of at least three (3) years and shall provide this information to the CAISO as may be reasonably requested from time to time by the CAISO.

\*\*\*\*

#### **10.3.9 Certification Of Meters**

Scheduling Coordinators shall ensure that revenue meters and related Metering Facilities of those Scheduling Coordinator Metered Entities whom they represent are certified in accordance with any certification criteria prescribed by the relevant Local Regulatory Authority or, if no such criteria

have been prescribed by that Local Regulatory Authority, certified in accordance with this Section 10. Scheduling Coordinators shall upon request of the CAISO supply promptly copies of all certificates issued by the relevant Local Regulatory Authority. Scheduling Coordinators of a Distributed Energy Resource Aggregation for which no Local Regulatory Authority criteria have been prescribed for Metering Facilities may self-certify that their Metering Facilities meet the default certification criteria set forth in the CAISO Business Practice Manual. The End-Use Meter of a Scheduling Coordinator Metered Entity in place as of the CAISO Operations Date is deemed to be certified as in compliance with this CAISO Tariff and Business Practice Manuals. Once certified, meters for Scheduling Coordinator Metered Entities need not be recertified provided such meters are maintained so as to meet the standards and accuracy requirements prescribed by any relevant Local Regulatory Authority or, if no such standards have been prescribed by that Local Regulatory Authority, such requirements as referred to in the Business Practice Manuals and this Section 10. Recertification is not required by the CAISO upon an election by a Scheduling Coordinator Metered Entity to change its Scheduling Coordinator from which it takes service.

\*\*\*\*

#### **10.3.11 Scheduling Coordinator To Ensure Certification**

If the relevant Local Regulatory Authority has not prescribed any certification criteria for the Metering Facilities of a Scheduling Coordinator Metered Entity, the Scheduling Coordinator representing that Scheduling Coordinator Metered Entity must promptly notify the CAISO in writing that no such criteria have been prescribed. That Scheduling Coordinator will then be responsible for ensuring that the Scheduling Coordinator Metered Entities it represents obtain and maintain Certificates of Compliance in respect of all of the Metering Facilities of those Scheduling Coordinator Metered Entities in accordance with Section 10.3.9. Scheduling Coordinators must engage a CAISO Authorized Inspector to perform the certification of any Metering Facilities that are to be certified under the CAISO Tariff. Consistent with Section 10.3.9, Scheduling Coordinators of a Distributed Energy Resource Aggregation for which no Local Regulatory Authority criteria have been prescribed for Metering Facilities may self-certify that their Metering

Facilities meet the default certification criteria set forth in the CAISO Business Practice Manual and need not engage a CAISO Authorized Inspector to perform the certification of Metering Facilities of Distributed Energy Resources comprising their Distributed Energy Resource Aggregation(s).

\*\*\*\*

#### **16.5.1 System Emergency Exceptions**

As set forth in Section 4.2.1, all Market Participants, including Scheduling Coordinators, Utility Distribution Companies, Participating TOs, Participating Generators (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area), Participating Loads, Demand Response Providers, Distributed Energy Resource Providers, Balancing Authorities (to the extent the agreement between the Balancing Authority and the CAISO so provides), and MSS Operators within the CAISO Balancing Authority Area and all System Resources must comply fully and promptly with CAISO Dispatch Instructions and operating orders, unless such operation would impair public health or safety. The CAISO will honor the terms of Existing Contracts, provided that in a System Emergency and circumstances in which the CAISO considers that a System Emergency is imminent or threatened, holders of Existing Rights must follow CAISO operating orders even if those operating orders directly conflict with the terms of Existing Contracts, unless such operating orders are inconsistent with the terms of an agreement between the CAISO and a Balancing Authority. In the event of a conflict between the CAISO Tariff and an agreement between the CAISO and a Balancing Authority, the agreement will govern. For this purpose CAISO operating orders to shed Load shall not be considered as an impairment to public health or safety. This section does not prohibit a Scheduling Coordinator from modifying its Bid or re-purchasing Energy in the Real-Time Market.

\* \* \* \*

#### **17.2.1 System Emergency Exceptions**

As set forth in Section 4.2.1, all Market Participants, including Scheduling Coordinators, Utility Distribution Companies, Participating TOs, Participating Generators (which includes Pseudo-

Ties of Generating Units to the CAISO Balancing Authority Area), Participating Loads, Demand Response Providers, Distributed Energy Resource Providers, Balancing Authorities (to the extent the agreement between the Balancing Authority and the CAISO so provides), and MSS Operators within the CAISO Balancing Authority Area and all System Resources must comply fully and promptly with the CAISO's Dispatch Instructions and operating orders, unless such operation would impair public health or safety. The CAISO will honor the terms of TORs, provided that in a System Emergency and circumstances in which the CAISO considers that a System Emergency is imminent or threatened, to enable the CAISO to exercise its responsibilities as Balancing Authority in accordance with Applicable Reliability Criteria, holders of TORs must follow CAISO operating orders even if those operating orders directly conflict with the terms of applicable Existing Contracts or any other contracts pertaining to the TORs, unless such operating orders are inconsistent with the terms of an agreement between the CAISO and a Balancing Authority. In the event of a conflict between the CAISO Tariff and an agreement between the CAISO and a Balancing Authority, the agreement will govern. For this purpose CAISO operating orders to shed Load shall not be considered as an impairment to public health or safety. This section does not prohibit a Scheduling Coordinator from modifying its Bid or re-purchasing Energy in the RTM.

\* \* \* \*

#### **30.5.2.6 Supply Bids for Distributed Energy Resource Aggregations**

In addition to the common elements listed in Section 30.5.2.1, Supply Bids for Distributed Energy Resource Aggregations will contain the following components as applicable: Generation Distribution Factors, Ramp Rate, Minimum and Maximum Operating Limits; Energy Limit, and Contingency Flag. If the Scheduling Coordinator does not submit the Generation Distribution Factors for the Bid, the CAISO will use default Generation Distribution Factors registered in Master File.

**[Existing Sections 30.5.2.6 and 30.5.2.7 will be renumbered]**

\* \* \* \*

#### **37.8.4 Notice**

The CAISO shall provide notice of the investigation in sufficient detail to allow for a meaningful response to the Scheduling Coordinator and, as limited below, to all Market Participant(s) the Scheduling Coordinator represents that are the subject(s) of the investigation. The CAISO shall contact the Market Participant(s) that may be involved, so long as the CAISO has sufficient objective information to identify and verify the role of the Market Participant(s) in the potential Rules of Conduct violation. Such Market Participant(s) will likely have an existing contractual relationship with the CAISO (e.g., UDC, MSS, CAISO Metered Entity, Participating Transmission Owner, Participating Generator, Participating Load, Distributed Energy Resource Provider, or Demand Response Provider).

\* \* \* \*

### **Appendix A Master Definition Supplement**

\* \* \* \*

#### **Distributed Energy Resource**

Any resource with a first point of interconnection to a Utility Distribution Company or a Metered Subsystem.

#### **Distributed Energy Resource Aggregation**

A resource comprised of one or more Distributed Energy Resources.

#### **Distributed Energy Resource Provider**

The owner/operator of one or more Distributed Energy Resource Aggregations that participates in the CAISO markets as such.

#### **Distributed Energy Resource Provider Agreement**

An agreement between the CAISO and a Distributed Energy Resource Provider, a pro forma version of which is set forth in Appendix B.21.

\* \* \* \*

**Generation Distribution Factor (GDF)**

The Bid template component that indicates the proportions of how the Bid is distributed for the resources participating in Physical Scheduling Plants, System Units, or Distributed Energy Resource Aggregations.

\* \* \* \*

**Scheduling Coordinator Metered Entity**

An entity that is (1) a Generator, Eligible Customer, End-User, Reliability Demand Response Resource, Proxy Demand Resource, or Distributed Energy Resource Aggregation that is not a CAISO Metered Entity; (2) an EIM Entity; and (3) an EIM Participating Resource that elects to be a Scheduling Coordinator Metered Entity with regard to some or all of the EIM Resources it represents.

\* \* \* \*

**Appendix B.21 Distributed Energy Resource Provider Agreement**

**CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION**

**AND**

**[DISTRIBUTED ENERGY RESOURCE PROVIDER]**

## DISTRIBUTED ENERGY RESOURCE PROVIDER AGREEMENT

**THIS AGREEMENT** is dated this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ and is entered into, by and between:

(1) **[Full legal name]**, having its registered and principal place of business located at [legal address] (the "Distributed Energy Resource Provider");

and

(2) **California Independent System Operator Corporation ("CAISO")**, a California nonprofit public benefit corporation having a principal executive office located at such place in the State of California as the CAISO Governing Board may from time to time designate.

The Distributed Energy Resource Provider and the CAISO are hereinafter referred to as the "Parties".

### Whereas:

- A. The CAISO Tariff provides that the CAISO shall only accept Bids for a Distributed Energy Resource Aggregation from a Scheduling Coordinator.
- B. The CAISO Tariff further provides that Energy and Ancillary Services may be provided by Distributed Energy Resource Providers.
- C. The Distributed Energy Resource Provider desires to provide Energy and/or Ancillary Services from one or more Distributed Energy Resource Aggregations through a Scheduling Coordinator and represents to the CAISO that it will comply with the applicable provisions of the CAISO Tariff.
- D. The Parties are entering into this Agreement in order to establish the terms and conditions on which the CAISO and the Distributed Energy Resource Provider will discharge their respective duties and responsibilities under the CAISO Tariff.

NOW THEREFORE, in consideration of the mutual covenants set forth herein, **THE PARTIES AGREE** as follows:

## ARTICLE I

### DEFINITIONS AND INTERPRETATION

- 1.1 **Master Definitions Supplement.** All terms and expressions used in this Agreement shall have the same meaning as those contained in the Master Definitions Supplement in Appendix A of the CAISO Tariff.
- 1.2 **Rules of Interpretation.** The following rules of interpretation and conventions shall apply to this Agreement:

- (a) if there is any inconsistency between this Agreement and the CAISO Tariff, the CAISO Tariff will prevail to the extent of the inconsistency;
- (b) the singular shall include the plural and vice versa;
- (c) the masculine shall include the feminine and neutral and vice versa;
- (d) "includes" or "including" shall mean "including without limitation";
- (e) references to a Section, Article or Schedule shall mean a Section, Article or a Schedule of this Agreement, as the case may be, unless the context otherwise requires;
- (f) a reference to a given agreement or instrument shall be a reference to that agreement or instrument as modified, amended, supplemented or restated through the date as of which such reference is made;
- (g) unless the context otherwise requires, references to any law shall be deemed references to such law as it may be amended, replaced or restated from time to time;
- (h) unless the context otherwise requires, any reference to a "person" includes any individual, partnership, firm, company, corporation, joint venture, trust, association, organization or other entity, in each case whether or not having separate legal personality;
- (i) unless the context otherwise requires, any reference to a Party includes a reference to its permitted successors and assigns;
- (j) any reference to a day, week, month or year is to a calendar day, week, month or year; and
- (k) the captions and headings in this Agreement are inserted solely to facilitate reference and shall have no bearing upon the interpretation of any of the terms and conditions of this Agreement.

## ARTICLE II

### ACKNOWLEDGEMENTS OF DISTRIBUTED ENERGY RESOURCE PROVIDER AND CAISO

- 2.1 CAISO Responsibility.** The Parties acknowledge that the CAISO is responsible for the efficient use and reliable operation of the CAISO Controlled Grid consistent with achievement of planning and Operating Reserve criteria no less stringent than those established by the Western Electricity Coordinating Council and the North American Electric Reliability Corporation and further acknowledge that the CAISO may not be able to satisfy fully these responsibilities if the Distributed Energy Resource Provider fails to fully comply with all of its obligations under this Agreement and the CAISO Tariff.
- 2.2 Scope of Application to Parties.** The Distributed Energy Resource Provider and CAISO acknowledge that to submit Bids for Distributed Energy Resource Aggregations to the CAISO through a Scheduling Coordinator, the Distributed Energy Resource Provider must sign this Agreement in accordance with Section 4.17 of the CAISO Tariff.
- 2.3 Distributed Energy Resource Provider Responsibility.** The Distributed Energy Resource Provider acknowledges that it has the responsibility to ensure that it owns, operates, or has sufficient contractual entitlement to provide Energy and/or Ancillary

Services from the Distributed Energy Resource Aggregation(s) it represents in accordance with the CAISO Tariff.

## ARTICLE III

### TERM AND TERMINATION

- 3.1 Effective Date.** This Agreement shall be effective as of the later of the date it is executed by the Parties or the date accepted for filing and made effective by FERC, if such FERC filing is required, and shall remain in full force and effect until terminated pursuant to Section 3.2 of this Agreement.
- 3.2 Termination**
- 3.2.1 Termination by CAISO.** Subject to Section 5.2, the CAISO may terminate this Agreement by giving written notice of termination in the event that the Distributed Energy Resource Provider commits any material default under this Agreement and/or the CAISO Tariff which, if capable of being remedied, is not remedied within thirty (30) days after the CAISO has given, to the Distributed Energy Resource Provider, written notice of the default, unless excused by reason of Uncontrollable Forces in accordance with Article X of this Agreement; provided, however, that any outstanding financial right or obligation or any other obligation under the CAISO Tariff of the Distributed Energy Resource Provider that has arisen while the Distributed Energy Resource Provider was submitting Bids for Distributed Energy Resource Aggregation(s), and any provision of this Agreement necessary to give effect to such right or obligation, shall survive until satisfied. With respect to any notice of termination given pursuant to this Section, the CAISO must file a timely notice of termination with FERC, if this Agreement was filed with FERC, or must otherwise comply with the requirements of FERC Order No. 2001 and related FERC orders. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the filing of the notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination within sixty (60) days after issuance of the notice of default; or (2) the CAISO files the notice of termination in accordance with the requirements of FERC Order No. 2001. This Agreement shall terminate upon acceptance by FERC of such a notice of termination, if filed with FERC, or thirty (30) days after the date of the CAISO's notice of default, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders.
- 3.2.2 Termination by Distributed Energy Resource Provider.** In the event that the Distributed Energy Resource Provider no longer wishes to submit Bids or transmit Energy over the CAISO Controlled Grid, it may terminate this Agreement, on giving the CAISO not less than ninety (90) days written notice, provided, however, that in accordance with Section 4.1.2, the Distributed Energy Resource Provider may eliminate from the Distributed Energy Resource Aggregations(s) which it no longer provides for and such modification shall be effective upon receipt of notice by the CAISO. With respect to any notice of termination given pursuant to this Section, the CAISO must file a timely notice of termination with FERC, if this Agreement has been filed with FERC, or must otherwise comply with the requirements of FERC Order No. 2001 and related FERC orders. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the request to file a notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination within thirty (30) days of receipt of such request; or (2) the CAISO files the notice of termination in accordance with the requirements of FERC Order No. 2001. This Agreement shall terminate upon acceptance by FERC of such a notice of termination, if such notice is required to be filed with FERC, or upon ninety (90) days after the CAISO's receipt of the

Distributed Energy Resource Provider's notice of termination, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders.

## ARTICLE IV

### GENERAL TERMS AND CONDITIONS

- 4.1 General Terms and Conditions Applicable to Distributed Energy Resource Providers**
- 4.1.1 Distributed Energy Resource Provider Requirements.** A Distributed Energy Resource Provider must satisfy all applicable rules and regulations of the Utility Distribution Company or Metered Subsystem tariffs as well as any requirements of the applicable Local Regulatory Authority, as well as applicable interconnection requirements, if any. A Distributed Energy Resource Provider must ensure that Distributed Energy Resources that comprise its Distributed Energy Resource Aggregation satisfy all applicable rules and regulations of Utility Distribution Company or Metered Subsystem tariffs, any requirements of the Local Regulatory Authority, as well as applicable interconnection requirements, if any. The Distributed Energy Resource Provider must certify to the CAISO that any required agreements between the Distributed Energy Resource Provider and the Load Serving Entities or other agreements required by the Local Regulatory Authority are fully executed.
- 4.1.2 Agreement Subject to CAISO Tariff.** The Distributed Energy Resource Provider must comply with all applicable terms of the CAISO Tariff. This Agreement shall be subject to the CAISO Tariff, which shall be deemed to be incorporated herein.
- 4.1.3 Obligations relating to Major Incidents.** The Distributed Energy Resource Provider shall promptly provide such information as the CAISO may reasonably require in relation to the CAISO's investigations of operating situations or events, or for the CAISO's reporting to the authorities such as the FERC, California Public Utilities Commission, Western Electricity Coordinating Council, or North American Electric Reliability Corporation.
- 4.2.1 Technical Characteristics.** The Distributed Energy Resource Provider has identified the Distributed Energy Resources that it owns, operates, or has a contractual entitlement to as part of a Distributed Energy Resource Aggregation in Schedule 1, as required by Section 4.17 of the CAISO Tariff. The Distributed Energy Resource Provider has also provided to the CAISO in Schedule 1 the required information regarding the capacity and operating characteristics of each of the Distributed Energy Resource Aggregations listed in that schedule. Pursuant to Sections 8.9 and 8.10 of the CAISO Tariff, the CAISO may verify, inspect, and test the capacity and operating characteristics of the Distributed Energy Resource Aggregations identified in Schedule 1.
- 4.2.2 Metering and Communication.** Metering requirements for the submittal of Settlement Quality Meter Data for Scheduling Coordinator Metered Entities will be in accordance with Section 10.3 of the CAISO Tariff. Pursuant to Sections 8.4.5 and 8.4.6 of the CAISO Tariff, Distributed Energy Resource Aggregations that are scheduled or bid as qualifying Ancillary Services are required to comply with the CAISO's communication and metering requirements.
- 4.2.3 Notification of Changes.** The Distributed Energy Resource Provider shall notify the CAISO of any proposed change(s) to the registration of technical information for its

Distributed Energy Resource Aggregation(s). The CAISO shall confer with the applicable Utility Distribution Company or Metered Subsystem regarding any changes provided about Distributed Energy Resources comprising a Distributed Energy Resource Aggregation(s) pursuant to Section 4.17.4 of the CAISO Tariff and applicable Business Practice Manual. Thereafter, the CAISO will update its Master File in accordance with Section 30.7.3.2 of the CAISO Tariff. Pursuant to Sections 8.9 and 8.10 of the CAISO Tariff, the CAISO may verify, inspect and test the capacity and operating characteristics of the revised information provided. Unless the Distributed Energy Resource fails to test at the values in the proposed change(s), the Distributed Energy Resource Provider's proposed change(s) will become effective upon the effective date for the next scheduled update of the Master File, provided that the Distributed Energy Resource Provider submits the changed information by the applicable deadline and is tested by the deadline. Subject to such notification, this Agreement shall not apply to any Distributed Energy Resources which the Distributed Energy Resource Provider no longer owns, operates or to which it no longer has a contractual entitlement.

#### **4.2.4 Obligations Relating to Energy and Ancillary Services**

**4.2.4.1 Submission of Bids and Self-provided Schedules.** When the Scheduling Coordinator on behalf of the Distributed Energy Resource Provider submits a Bid, the Distributed Energy Resource Provider will, by the operation of this Section 4.2.4.1, warrant to the CAISO that it has the capability to provide that service in accordance with the CAISO Tariff and that it will comply with CAISO Dispatch Instructions for the provision of the service in accordance with the CAISO Tariff.

**4.2.4.2 Ancillary Service Certification.** The Distributed Energy Resource Provider shall not use a Scheduling Coordinator to submit a Bid for the provision of an Ancillary Service or submit a Submission to Self-Provide an Ancillary Service unless the Scheduling Coordinator serving that Distributed Energy Resource Provider is in possession of a current Ancillary Service certificate pursuant to Sections 8.3.4 and 8.4 of the CAISO Tariff.

### **ARTICLE V**

#### **PENALTIES AND SANCTIONS**

**5.1 Penalties.** If the Distributed Energy Resource Provider fails to comply with any provisions of this Agreement, the CAISO shall be entitled to impose penalties and sanctions on the Distributed Energy Resource Provider. No penalties or sanctions may be imposed under this Agreement unless a Schedule or CAISO Tariff provision providing for such penalties or sanctions has first been filed with and made effective by FERC. Nothing in this Agreement, with the exception of the provisions relating to the CAISO ADR Procedures, shall be construed as waiving the rights of the Distributed Energy Resource Provider to oppose or protest any penalty proposed by the CAISO to the FERC or the specific imposition by the CAISO of any FERC-approved penalty on the Distributed Energy Resource Provider.

**5.2 Corrective Measures.** If the Distributed Energy Resource Provider fails to meet or maintain the requirements or its responsibilities set forth in this Agreement and/or the CAISO Tariff, the CAISO shall be permitted to take any of the measures, contained or referenced in the CAISO Tariff, which the CAISO deems to be necessary to correct the situation.

### **ARTICLE VI**

## COSTS

- 6.1 Operating and Maintenance Costs.** The Distributed Energy Resource Provider shall be responsible for all its costs incurred in meeting its obligations under this Agreement for the Distributed Energy Resource Aggregation(s) identified in Schedule 1.

## ARTICLE VII

### DISPUTE RESOLUTION

- 7.1 Dispute Resolution.** The Parties shall make reasonable efforts to settle all disputes arising out of or in connection with this Agreement. In the event any dispute is not settled, the Parties shall adhere to the CAISO ADR Procedures set forth in Section 13 of the CAISO Tariff, which is incorporated by reference, except that any reference in Section 13 of the CAISO Tariff to Market Participants shall be read as a reference to the Distributed Energy Resource Provider and references to the CAISO Tariff shall be read as references to this Agreement.

## ARTICLE VIII

### REPRESENTATIONS AND WARRANTIES

- 8.1 Authorization to Enter Into Agreement.** Each Party represents and warrants that the execution, delivery and performance of this Agreement by it has been duly authorized by all necessary corporate and/or governmental actions, to the extent authorized by law.
- 8.2 Necessary Approvals as to Distributed Energy Resources.** The Distributed Energy Resource Provider represents that all necessary leases, approvals, permits, licenses, easements, rights of way or access to install, own and/or operate the Distributed Energy Resource Aggregation(s) for which it will Bid or otherwise act under this Agreement have been obtained by the Distributed Energy Resource Provider prior to submitting technical information to the CAISO.

## ARTICLE IX

### LIABILITY

- 9.1 Liability.** The provisions of Section 14 of the CAISO Tariff will apply to liability arising under this Agreement, except that all references in Section 14 of the CAISO Tariff to Market Participants shall be read as references to the Distributed Energy Resource Provider and references to the CAISO Tariff shall be read as references to this Agreement.

## ARTICLE X

### UNCONTROLLABLE FORCES

- 10.1 Uncontrollable Forces Tariff Provisions.** Section 14.1 of the CAISO Tariff shall be incorporated by reference into this Agreement except that all references in Section 14.1 of the CAISO Tariff to Market Participants shall be read as a reference to the Distributed Energy Resource Provider and references to the CAISO Tariff shall be read as references to this Agreement.

## ARTICLE XI

## MISCELLANEOUS

- 11.1 Assignments.** Either Party may assign or transfer any or all of its rights and/or obligations under this Agreement with the other Party's prior written consent in accordance with Section 22.2 of the CAISO Tariff. Such consent shall not be unreasonably withheld. Any such transfer or assignment shall be conditioned upon the successor in interest accepting the rights and/or obligations under this Agreement as if said successor in interest was an original Party to this Agreement.
- 11.2 Notices.** Any notice, demand, or request which may be given to or made upon either Party regarding this Agreement shall be made in accordance with Section 22.4 of the CAISO Tariff, provided that all references in Section 22.4 of the CAISO Tariff to Market Participants shall be read as a reference to the Distributed Energy Resource Provider and references to the CAISO Tariff shall be read as references to this Agreement, and unless otherwise stated or agreed shall be made to the representative of the other Party indicated in Schedule 2. A Party must update the information in Schedule 2 of this Agreement as information changes. Such changes shall not constitute an amendment to this Agreement.
- 11.3 Waivers.** Any waiver at any time by either Party of its rights with respect to any default under this Agreement, or with respect to any other matter arising in connection with this Agreement, shall not constitute or be deemed a waiver with respect to any subsequent default or other matter arising in connection with this Agreement. Any delay, short of the statutory period of limitations, in asserting or enforcing any right under this Agreement shall not constitute or be deemed a waiver of such right.
- 11.4 Governing Law and Forum.** This Agreement shall be deemed to be a contract made under, and for all purposes shall be governed by and construed in accordance with, the laws of the State of California, except its conflict of law provisions. The Parties irrevocably consent that any legal action or proceeding arising under or relating to this Agreement to which the CAISO ADR Procedures do not apply, shall be brought in any of the following forums, as appropriate: any court of the State of California, any federal court of the United States of America located in the State of California, or, where subject to its jurisdiction, before the Federal Energy Regulatory Commission.
- 11.5 Consistency with Federal Laws and Regulations.** This Agreement shall incorporate by reference Section 22.9 of the CAISO Tariff as if the references to the CAISO Tariff were referring to this Agreement.
- 11.6 Merger.** This Agreement constitutes the complete and final agreement of the Parties with respect to the subject matter hereof and supersedes all prior agreements, whether written or oral, with respect to such subject matter.
- 11.7 Severability.** If any term, covenant, or condition of this Agreement or the application or effect of any such term, covenant, or condition is held invalid as to any person, entity, or circumstance, or is determined to be unjust, unreasonable, unlawful, imprudent, or otherwise not in the public interest by any court or government agency of competent jurisdiction, then such term, covenant, or condition shall remain in force and effect to the maximum extent permitted by law, and all other terms, covenants, and conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect and the Parties shall be relieved of their obligations only to the extent necessary to eliminate such regulatory or other determination unless a court or governmental agency of competent jurisdiction holds that such provisions are not separable from all other provisions of this Agreement.

**11.8 Amendments.** This Agreement and the Schedules attached hereto may be amended from time to time by the mutual agreement of the Parties in writing. Amendments that require FERC approval shall not take effect until FERC has accepted such amendments for filing and made them effective. Nothing herein shall be construed as affecting in any way the right of the CAISO to make unilateral application to FERC for a change in the rates, terms and conditions of this Agreement under Section 205 of the FPA and pursuant to FERC's rules and regulations promulgated thereunder, and the Distributed Energy Resource Provider shall have the right to make a unilateral filing with FERC to modify this Agreement pursuant to Section 206 or any other applicable provision of the FPA and FERC's rules and regulations thereunder; provided that each Party shall have the right to protest any such filing by the other Party and to participate fully in any proceeding before FERC in which such modifications may be considered. Nothing in this Agreement shall limit the rights of the Parties or of FERC under Sections 205 or 206 of the FPA and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein. The standard of review FERC shall apply when acting upon proposed modifications to this Agreement by the CAISO shall be the "just and reasonable" standard of review rather than the "public interest" standard of review. The standard of review FERC shall apply when acting upon proposed modifications to this Agreement by FERC's own motion or by a signatory other than the CAISO or non-signatory entity shall also be the "just and reasonable" standard of review. Schedules 1, and 2 are provided for informational purposes and revisions to those schedules do not constitute a material change in the Agreement warranting FERC review.

**11.9 Counterparts.** This Agreement may be executed in one or more counterparts at different times, each of which shall be regarded as an original and all of which, taken together, shall constitute one and the same Agreement.

**IN WITNESS WHEREOF**, the Parties hereto have caused this Agreement to be duly executed on behalf of each by and through their authorized representatives as of the date hereinabove written.

**California Independent System Operator Corporation**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**Distributed Energy Resource Provider**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**SCHEDULE 1**

**SCHEDULE 2**

**NOTICES**

**(Section 11.2)**

**Distributed Energy Resource Provider**

Name of Primary

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code: \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code: \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

**CAISO**

Name of Primary

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code: \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code: \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

**SCHEDULE 3**

**CAISO IMPOSED PENALTIES AND SANCTIONS**

**[Section 5.1]**

**TO BE INSERTED UPON FERC APPROVAL**

**Attachment B – Marked Tariff Records**

**Distributed Energy Resource Provider Initiative  
California Independent System Operator Corporation**

#### **4. Roles And Responsibilities**

#### **4.1 [NOT USED]**

#### **4.2 Market Participant Responsibilities**

##### **4.2.1 Comply With Dispatch Instructions And Operating Orders**

With respect to this Section 4.2, all Market Participants, including Scheduling Coordinators, Utility Distribution Companies, Participating Transmission Owners, Participating Generators, Participating Loads, Demand Response Providers, Distributed Energy Resource Providers, Balancing Authorities (to the extent the agreement between the Balancing Authority and the CAISO so provides), and MSS Operators within the CAISO Balancing Authority Area and all System Resources shall comply fully and promptly with the Dispatch Instructions and operating orders, unless such operation would impair public health or safety. A Market Participant is not required to comply with a CAISO operating order if it is physically impossible for the Market Participant to perform in compliance with that operating order. Shedding Load for a System Emergency does not constitute impairment to public health or safety. The Market Participant shall immediately notify the CAISO of its inability to perform in compliance with the operating order.

\* \* \* \*

#### **4.13 DRPs, RDRRs, and PDRs**

##### **4.13.1 Relationship Between CAISO and DRPs**

The CAISO shall only accept Bids for Energy from Reliability Demand Response Resources, and shall only accept Bids for Energy or Ancillary Services from Proxy Demand Resources, Submissions to Self-Provide Ancillary Services from Proxy Demand Resources, or submissions of Energy Self-Schedules from Proxy Demand Resources that have provided Submissions to Self-Provide Ancillary Services, if such Reliability Demand Response Resources or Proxy Demand Resources are represented by a Demand Response Provider that has entered into a Demand Response Provider Agreement with the CAISO, has accurately provided the information required in the Demand Response System, has satisfied all Reliability Demand Response Resource or Proxy Demand Resource registration requirements, and has met standards adopted

by the CAISO and published on the CAISO Website. Reliability Demand Response Resources and Proxy Demand Resources may not participate in a Distributed Energy Resource Aggregation. The CAISO shall not accept submitted Bids for Energy or Ancillary Services from a Demand Response Provider other than through a Scheduling Coordinator, which Scheduling Coordinator may be the Demand Response Provider itself or another entity.

\* \* \* \*

#### **4.17 Distributed Energy Resource Aggregations**

##### **4.17.1 CAISO Relationship with Distributed Energy Resource Providers**

The CAISO will accept Bids for Energy or Ancillary Services from Distributed Energy Resource Aggregations or submissions of Energy Self-Schedules from Distributed Energy Resource Aggregations, only if such Distributed Energy Resource Aggregations are represented by a Distributed Energy Resource Provider that has entered into a Distributed Energy Resource Provider Agreement with the CAISO to comply with all applicable provisions of the CAISO Tariff as they may be amended from time to time. The CAISO will not accept Bids for Energy or Ancillary Services from a Distributed Energy Resource Aggregation other than through a Scheduling Coordinator. The Scheduling Coordinator may be the Distributed Energy Resource Provider itself or another entity.

##### **4.17.2 Responsibilities of Distributed Energy Resource Providers**

The following general responsibilities apply to Distributed Energy Resource Providers:

- (a) Each Distributed Energy Resource Provider will operate and maintain its Distributed Energy Resource Aggregations consistent with applicable provisions of the CAISO Tariff.
- (b) Each Distributed Energy Resource Provider will comply with applicable Utility Distribution Company or Metered Subsystem tariffs and operating procedures incorporated therein as well as applicable requirements of the Local Regulatory Authority, if any. Each Distributed Energy Resource Provider will ensure that Distributed Energy Resources that comprise a Distributed Energy Resource

Aggregation under its control comply with applicable Utility Distribution Company or Metered Subsystem tariffs and operating procedures incorporated therein as well as applicable requirements of the Local Regulatory Authority, if any.

(c) Each Distributed Energy Resource Provider will comply with Applicable Reliability Criteria to the extent they apply.

(d) Each Distributed Energy Resource Provider will operate and maintain its Distributed Energy Resource Aggregation(s) consistent with applicable Operating Procedures and Business Practice Manuals established by the CAISO.

(e) Each Distributed Energy Resource Provider will operate its Distributed Energy Resource Aggregation(s) in a manner consistent with limitations established by or operating orders of the Utility Distribution Company or Metered Subsystem.

(f) The CAISO will coordinate with the applicable Utility Distribution Company or Metered subsystem to avoid conflicting operational directives, which may include but is not limited to sharing Dispatch Instructions.

#### **4.17.3 Requirements for Distributed Energy Resource Aggregations**

The following requirements apply to Distributed Energy Resource Aggregations:

(a) A Distributed Energy Resource Aggregation will consist of one (1) or more Distributed Energy Resources.

(b) A Distributed Energy Resource may not participate in more than one Distributed Energy Resource Aggregation.

(c) A Distributed Energy Resource participating in a Distributed Energy Resource Aggregation may not participate as a resource in the CAISO Market separate from the Distributed Energy Resource Aggregation.

(d) A Distributed Energy Resource participating in a Distributed Energy Resource Aggregation may not also participate in a retail net energy metering program that does not expressly permit wholesale market participation.

- (e) Each Distributed Energy Resource Aggregation must be located in a single Sub-LAP.
- (f) A Distributed Energy Resource Aggregation must provide a net response at its PNode(s) within its sub-LAP that is consistent with CAISO Dispatch Instructions and applicable Generation Distribution Factors submitted through the Distributed Energy Resource Aggregation's Bid or as registered in the Master File.
- (g) Distributed Energy Resource Aggregations are Scheduling Coordinator Metered Entities. Scheduling Coordinators for a Distributed Energy Resource Aggregation must have entered into a Scheduling Coordinator Metering Agreement with the CAISO. A Distributed Energy Resource participating in a Distributed Energy Resource Aggregation may not also participate in the CAISO Markets as a CAISO Metered Entity.

#### **4.17.4 Identification of Distributed Energy Resources**

Each Distributed Energy Resource Provider will provide information, as described in the Business Practice Manual, identifying each of its Distributed Energy Resource Aggregations and such information regarding the location, capacity, operating characteristics and applicable Generation Distribution Factors of its Distributed Energy Resource Aggregation(s) as may be reasonably requested from time to time by the CAISO. All information provided to the CAISO by a Distributed Energy Resource Provider regarding the operational and technical characteristics of its Distributed Energy Resource Aggregation(s) must be accurate.

As further described in the Business Practice Manual, the CAISO will confer with the applicable Utility Distribution Company or Metered Subsystem regarding information provided about Distributed Energy Resources comprising a Distributed Energy Resource Aggregation(s). The Utility Distribution Company or Metered Subsystem will have an opportunity to provide written comments within thirty (30) days regarding the accuracy of the information about Distributed Energy Resources comprising a Distributed Energy Resource Aggregation(s) or raise concerns

with respect to whether the Distributed Energy Resources (1) are participating in another Distributed Energy Resource Aggregation; (2) are participating as a Proxy Demand Response resource or a Reliability Demand Response Resource; (3) are participating in a retail net energy metering program that does not expressly permit wholesale market participation; (4) do not comply with applicable Utility Distribution Company tariffs or requirements of the relevant Local Regulatory Authority; or (5) may pose a threat to the safe and reliable operation of the Distribution System, if operated as part of a Distributed Energy Resource Aggregation. If the Utility Distribution Company or Metered Subsystem raises concerns based on these factors, the Distributed Energy Resource Provider will resolve those concerns with the Utility Distribution Company or Metered Subsystem prior to the CAISO allowing the individual Distributed Energy Resource to participate in a Distributed Energy Resource Aggregation. Any disputes regarding these concerns shall be undertaken with the applicable Governmental Authority for the Utility Distribution Company or Metered Subsystem and shall not be arbitrated or in any way resolved through a CAISO dispute resolution mechanism.

#### **4.17.5 Characteristics of Distributed Energy Resource Aggregations**

##### **4.17.5.1 Size Limits**

A Distributed Energy Resource Aggregation will be no smaller than 0.5 MW. A Distributed Energy Resource Aggregation that includes Distributed Energy Resources located at different PNodes will be no larger than 20 MW.

##### **4.17.5.2 Metering and Telemetry**

Scheduling Coordinators shall submit to the CAISO Actual Settlement Quality Meter Data or Estimated Settlement Quality Meter Data for Distributed Energy Resource Aggregations they represent for each Settlement Period in an Operating Day. Distributed Energy Resources participating in a Distributed Energy Resource Aggregation will be directly metered pursuant to a meter that complies with any applicable Utility Distribution Company tariff and any standards of the relevant Local Regulatory Authority or, if no such tariff exists or no standards have been set

by that Local Regulatory Authority, the metering standards as further detailed in the CAISO's Business Practice Manual. Distributed Energy Resource Providers must make Settlement Quality Meter Data from individual Distributed Energy Resources comprising a Distributed Energy Resource Aggregation available to the CAISO upon request.

Distributed Energy Resource Providers shall provide information regarding Distributed Energy Resource Aggregation(s) with a rated capacity of 10 MW or greater or, if the Distributed Energy Resource Aggregation(s) provides Ancillary Services, through telemetry to the CAISO's EMS in accordance with the CAISO's standards for direct telemetry and consistent with the requirement for telemetry set forth in Section 7.6.1.

#### **4.17.6 Operating Requirements**

Distributed Energy Resource Aggregations will respond to CAISO Dispatch Instructions. The CAISO may dispatch a Distributed Energy Resource Aggregation to the extent the Distributed Energy Resource Aggregation bids or schedules Energy or Ancillary Services into the CAISO Markets and receives an award. The CAISO may also issue an Exceptional Dispatch Instruction for the Distributed Energy Resource Aggregation for reliability pursuant to Section 34.10.

Distributed Energy Resource Aggregations shall respond to Dispatch Instructions consistent with Generation Distribution Factors for the Distributed Energy Resource Aggregation.

Each Distributed Energy Resource Provider will operate its Distributed Energy Resource Aggregation(s) in a manner consistent with limitations or operating orders established by the Utility Distribution Company or Metered Subsystem. Scheduling Coordinators for Distributed Energy Resources Providers shall submit Outages to the CAISO as necessary to reflect any distribution constraints impacting Distributed Energy Resources that comprise a Distributed Energy Resource Aggregation under its control. The CAISO shall have the authority to coordinate and approve Outage schedules for the Distributed Energy Resource Aggregation(s)

listed in a Distributed Energy Resource Provider Agreement, in accordance with the provisions of Section 9.

\* \* \* \*

### **6.3 Communication Of Dispatch Instructions**

Normal verbal and electronic communication of Dispatch Instructions between the CAISO and Generators, Participating Loads, Distributed Energy Resource Providers, or Demand Response Providers will be via the relevant Scheduling Coordinator.

#### **6.3.1 SC Responsibility For Communications To Generator Or Load**

Each Scheduling Coordinator must immediately pass on to the Generator, Participating Load, Distributed Energy Resource Provider, or Demand Response Provider concerned any communication for the Generator, Participating Load, or Demand Response Provider which it receives from the CAISO.

Communication delays by the Scheduling Coordinator may result in Uninstructed Deviation Penalties or other adjustments pursuant to this CAISO Tariff. The CAISO may, with the prior permission of the Scheduling Coordinator concerned, communicate with and give Dispatch Instructions to the operators of Generating Units, Participating Loads, Distributed Energy Resource Providers, and to Demand Response Providers, directly without having to communicate through their appointed Scheduling Coordinator. In situations of deteriorating system conditions or emergency, the CAISO reserves the right to communicate directly with the Generator(s), Distributed Energy Resource Providers, and Demand Response Providers as required to ensure System Reliability.

\* \* \* \*

### **10.3.2 Responsibilities Of Scheduling Coordinators And The CAISO**

#### **10.3.2.1 Duty to Provide Settlement Quality Meter Data**

Scheduling Coordinators shall be responsible for: (i) the collection of Meter Data for the Scheduling Coordinator Metered Entities it represents; (ii) the provision of Settlement Quality Meter Data to the CAISO; and (iii) ensuring that the Settlement Quality Meter Data supplied to the

CAISO meets the requirements of Section 10. Scheduling Coordinators shall provide the CAISO with Settlement Quality Meter Data for all Scheduling Coordinator Metered Entities served by the Scheduling Coordinator no later than the day specified in Section 10.3.6 or the day specified in Section 10.3.6.4, as applicable. Settlement Quality Meter Data for these Scheduling Coordinator Metered Entities shall be an accurate measure of the actual production or consumption of Energy by each Scheduling Coordinator Metered Entity in each Settlement Period.

#### **10.3.2.1.1 Requirements for SCs Representing Demand Response Providers**

Each Scheduling Coordinator for a Demand Response Provider shall aggregate the Settlement Quality Meter Data of the underlying Proxy Demand Resource or Reliability Demand Response Resource to the level of the registration configuration of the Proxy Demand Resource or Reliability Demand Response Resource in the Demand Response System. Settlement Quality Meter Data for these Scheduling Coordinator Metered Entities shall be either ~~(1) an accurate measure of the actual consumption of Energy by each Scheduling Coordinator Metered Entity in each Settlement Period; (2) for Scheduling Coordinator Metered Entities connected to a UDC Distribution System and meeting that Distribution System's requirement for Load profiling eligibility, a profile of that consumption derived directly from an accurate cumulative measure of the actual consumption of Energy over a known period of time and an allocation of that consumption to Settlement Periods using the applicable Approved Load Profile; or (3) an accurate calculation by the Scheduling Coordinator representing entities operating pursuant to Existing Contracts.~~ (1) an accurate measure of the actual consumption of Energy by each Scheduling Coordinator Metered Entity in each Settlement Period; or (2) statistically derived meter data pursuant to Section 10.1.7.

#### **10.3.2.1.2 Requirements for SCs Representing Distributed Energy Resource**

##### **Aggregations**

Each Scheduling Coordinator for a Distributed Energy Resource Aggregation shall aggregate the Settlement Quality Meter Data of the underlying Distributed Energy Resources to the level of the Distributed Energy Resources Aggregation provided in the Distributed Energy Resource Provider Agreement. Settlement Quality Meter Data for these Scheduling Coordinator Metered Entities shall be an accurate measure of the actual production or consumption of Energy by each

Distributed Energy Resource that comprises a Distributed Energy Resource Aggregation in each Settlement Period. Scheduling Coordinators shall retain Settlement Quality Meter Data of each Distributed Energy Resource comprising a Distributed Energy Resource Aggregation for a period of at least three (3) years and shall provide this information to the CAISO as may be reasonably requested from time to time by the CAISO.

\*\*\*\*

### **10.3.9 Certification Of Meters**

Scheduling Coordinators shall ensure that revenue meters and related Metering Facilities of those Scheduling Coordinator Metered Entities whom they represent are certified in accordance with any certification criteria prescribed by the relevant Local Regulatory Authority or, if no such criteria have been prescribed by that Local Regulatory Authority, certified in accordance with this Section 10. Scheduling Coordinators shall upon request of the CAISO supply promptly copies of all certificates issued by the relevant Local Regulatory Authority. Scheduling Coordinators of a Distributed Energy Resource Aggregation for which no Local Regulatory Authority criteria have been prescribed for Metering Facilities may self-certify that their Metering Facilities meet the default certification criteria set forth in the CAISO Business Practice Manual. The End-Use Meter of a Scheduling Coordinator Metered Entity in place as of the CAISO Operations Date is deemed to be certified as in compliance with this CAISO Tariff and Business Practice Manuals. Once certified, meters for Scheduling Coordinator Metered Entities need not be recertified provided such meters are maintained so as to meet the standards and accuracy requirements prescribed by any relevant Local Regulatory Authority or, if no such standards have been prescribed by that Local Regulatory Authority, such requirements as referred to in the Business Practice Manuals and this Section 10. Recertification is not required by the CAISO upon an election by a Scheduling Coordinator Metered Entity to change its Scheduling Coordinator from which it takes service.

\*\*\*\*

### **10.3.11 Scheduling Coordinator To Ensure Certification**

If the relevant Local Regulatory Authority has not prescribed any certification criteria for the Metering Facilities of a Scheduling Coordinator Metered Entity, the Scheduling Coordinator representing that Scheduling Coordinator Metered Entity must promptly notify the CAISO in writing that no such criteria have been prescribed. That Scheduling Coordinator will then be responsible for ensuring that the Scheduling Coordinator Metered Entities it represents obtain and maintain Certificates of Compliance in respect of all of the Metering Facilities of those Scheduling Coordinator Metered Entities in accordance with Section 10.3.9. Scheduling Coordinators must engage a CAISO Authorized Inspector to perform the certification of any Metering Facilities that are to be certified under the CAISO Tariff. Consistent with Section 10.3.9, Scheduling Coordinators of a Distributed Energy Resource Aggregation for which no Local Regulatory Authority criteria have been prescribed for Metering Facilities may self-certify that their Metering Facilities meet the default certification criteria set forth in the CAISO Business Practice Manual and need not engage a CAISO Authorized Inspector to perform the certification of Metering Facilities of Distributed Energy Resources comprising their Distributed Energy Resource Aggregation(s).

\*\*\*\*

#### **16.5.1 System Emergency Exceptions**

As set forth in Section 4.2.1, all Market Participants, including Scheduling Coordinators, Utility Distribution Companies, Participating TOs, Participating Generators (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area), Participating Loads, Demand Response Providers, Distributed Energy Resource Providers, Balancing Authorities (to the extent the agreement between the Balancing Authority and the CAISO so provides), and MSS Operators within the CAISO Balancing Authority Area and all System Resources must comply fully and promptly with CAISO Dispatch Instructions and operating orders, unless such operation would impair public health or safety. The CAISO will honor the terms of Existing Contracts, provided that in a System Emergency and circumstances in which the CAISO considers that a System Emergency is imminent or threatened, holders of Existing Rights must follow CAISO operating orders even if those operating orders directly conflict with the terms of Existing Contracts, unless

such operating orders are inconsistent with the terms of an agreement between the CAISO and a Balancing Authority. In the event of a conflict between the CAISO Tariff and an agreement between the CAISO and a Balancing Authority, the agreement will govern. For this purpose CAISO operating orders to shed Load shall not be considered as an impairment to public health or safety. This section does not prohibit a Scheduling Coordinator from modifying its Bid or re-purchasing Energy in the Real-Time Market.

\* \* \* \*

### **17.2.1 System Emergency Exceptions**

As set forth in Section 4.2.1, all Market Participants, including Scheduling Coordinators, Utility Distribution Companies, Participating TOs, Participating Generators (which includes Pseudo-Ties of Generating Units to the CAISO Balancing Authority Area), Participating Loads, Demand Response Providers, Distributed Energy Resource Providers, Balancing Authorities (to the extent the agreement between the Balancing Authority and the CAISO so provides), and MSS Operators within the CAISO Balancing Authority Area and all System Resources must comply fully and promptly with the CAISO's Dispatch Instructions and operating orders, unless such operation would impair public health or safety.

The CAISO will honor the terms of TORs, provided that in a System Emergency and circumstances in which the CAISO considers that a System Emergency is imminent or threatened, to enable the CAISO to exercise its responsibilities as Balancing Authority in accordance with Applicable Reliability Criteria, holders of TORs must follow CAISO operating orders even if those operating orders directly conflict with the terms of applicable Existing Contracts or any other contracts pertaining to the TORs, unless such operating orders are inconsistent with the terms of an agreement between the CAISO and a Balancing Authority. In the event of a conflict between the CAISO Tariff and an agreement between the CAISO and a Balancing Authority, the agreement will govern. For this purpose CAISO operating orders to shed Load shall not be considered as an impairment to public health or safety. This section does not prohibit a Scheduling Coordinator from modifying its Bid or re-purchasing Energy in the RTM.

\* \* \* \*

### **30.5.2.6 Supply Bids for Distributed Energy Resource Aggregations**

In addition to the common elements listed in Section 30.5.2.1, Supply Bids for Distributed Energy Resource Aggregations will contain the following components as applicable: Generation Distribution Factors, Ramp Rate, Minimum and Maximum Operating Limits; Energy Limit, and Contingency Flag. If the Scheduling Coordinator does not submit the Generation Distribution Factors for the Bid, the CAISO will use default Generation Distribution Factors registered in Master File.

**[Existing Sections 30.5.2.6 and 30.5.2.7 will be renumbered]**

\* \* \* \*

### **37.8.4 Notice**

The CAISO shall provide notice of the investigation in sufficient detail to allow for a meaningful response to the Scheduling Coordinator and, as limited below, to all Market Participants the Scheduling Coordinator represents that are the subject(s) of the investigation. The CAISO shall contact the Market Participant(s) that may be involved, so long as the CAISO has sufficient objective information to identify and verify the role of the Market Participant(s) in the potential Rules of Conduct violation. Such Market Participant(s) will likely have an existing contractual relationship with the CAISO (e.g., UDC, MSS, CAISO Metered Entity, Participating Transmission Owner, Participating Generator, Participating Load, Distributed Energy Resource Provider, or Demand Response Provider).

\* \* \* \*

## **Appendix A Master Definition Supplement**

\* \* \* \*

**Distributed Energy Resource**

Any resource with a first point of interconnection to a Utility Distribution Company or a Metered Subsystem.

**Distributed Energy Resource Aggregation**

A resource comprised of one or more Distributed Energy Resources.

**Distributed Energy Resource Provider**

The owner/operator of one or more Distributed Energy Resource Aggregations that participates in the CAISO markets as such.

**Distributed Energy Resource Provider Agreement**

An agreement between the CAISO and a Distributed Energy Resource Provider, a pro forma version of which is set forth in Appendix B.21.

\* \* \* \* \*

**Generation Distribution Factor (GDF)**

The Bid template component that indicates the proportions of how the Bid is distributed for the resources participating in Physical Scheduling Plants, ~~or System Units,~~ or Distributed Energy Resource Aggregations.

\* \* \* \* \*

**Scheduling Coordinator Metered Entity**

An entity that is (1) a Generator, Eligible Customer, End-User, Reliability Demand Response Resource, ~~or Proxy Demand Resource,~~ or Distributed Energy Resource Aggregation that is not a CAISO Metered Entity; (2) an EIM Entity; and (3) an EIM Participating Resource that elects to be a Scheduling Coordinator Metered Entity with regard to some or all of the EIM Resources it represents.

\* \* \* \* \*

Appendix B.21 Distributed Energy Resource Provider Agreement

CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

AND

[DISTRIBUTED ENERGY RESOURCE PROVIDER]

## DISTRIBUTED ENERGY RESOURCE PROVIDER AGREEMENT

THIS AGREEMENT is dated this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ and is entered into, by and between:

(1) [Full legal name], having its registered and principal place of business located at [legal address] (the "Distributed Energy Resource Provider");

and

(2) California Independent System Operator Corporation ("CAISO"), a California nonprofit public benefit corporation having a principal executive office located at such place in the State of California as the CAISO Governing Board may from time to time designate.

The Distributed Energy Resource Provider and the CAISO are hereinafter referred to as the "Parties".

### Whereas:

- A. The CAISO Tariff provides that the CAISO shall only accept Bids for a Distributed Energy Resource Aggregation from a Scheduling Coordinator.
- B. The CAISO Tariff further provides that Energy and Ancillary Services may be provided by Distributed Energy Resource Providers.
- C. The Distributed Energy Resource Provider desires to provide Energy and/or Ancillary Services from one or more Distributed Energy Resource Aggregations through a Scheduling Coordinator and represents to the CAISO that it will comply with the applicable provisions of the CAISO Tariff.
- D. The Parties are entering into this Agreement in order to establish the terms and conditions on which the CAISO and the Distributed Energy Resource Provider will discharge their respective duties and responsibilities under the CAISO Tariff.

NOW THEREFORE, in consideration of the mutual covenants set forth herein, THE PARTIES AGREE as follows:

### ARTICLE I

#### DEFINITIONS AND INTERPRETATION

- 1.1 Master Definitions Supplement. All terms and expressions used in this Agreement shall have the same meaning as those contained in the Master Definitions Supplement in Appendix A of the CAISO Tariff.
- 1.2 Rules of Interpretation. The following rules of interpretation and conventions shall apply to this Agreement:

- (a) if there is any inconsistency between this Agreement and the CAISO Tariff, the CAISO Tariff will prevail to the extent of the inconsistency;
- (b) the singular shall include the plural and vice versa;
- (c) the masculine shall include the feminine and neutral and vice versa;
- (d) "includes" or "including" shall mean "including without limitation";
- (e) references to a Section, Article or Schedule shall mean a Section, Article or a Schedule of this Agreement, as the case may be, unless the context otherwise requires;
- (f) a reference to a given agreement or instrument shall be a reference to that agreement or instrument as modified, amended, supplemented or restated through the date as of which such reference is made;
- (g) unless the context otherwise requires, references to any law shall be deemed references to such law as it may be amended, replaced or restated from time to time;
- (h) unless the context otherwise requires, any reference to a "person" includes any individual, partnership, firm, company, corporation, joint venture, trust, association, organization or other entity, in each case whether or not having separate legal personality;
- (i) unless the context otherwise requires, any reference to a Party includes a reference to its permitted successors and assigns;
- (j) any reference to a day, week, month or year is to a calendar day, week, month or year; and
- (k) the captions and headings in this Agreement are inserted solely to facilitate reference and shall have no bearing upon the interpretation of any of the terms and conditions of this Agreement.

## ARTICLE II

### ACKNOWLEDGEMENTS OF DISTRIBUTED ENERGY RESOURCE PROVIDER AND CAISO

- 2.1 CAISO Responsibility.** The Parties acknowledge that the CAISO is responsible for the efficient use and reliable operation of the CAISO Controlled Grid consistent with achievement of planning and Operating Reserve criteria no less stringent than those established by the Western Electricity Coordinating Council and the North American Electric Reliability Corporation and further acknowledge that the CAISO may not be able to satisfy fully these responsibilities if the Distributed Energy Resource Provider fails to fully comply with all of its obligations under this Agreement and the CAISO Tariff.
- 2.2 Scope of Application to Parties.** The Distributed Energy Resource Provider and CAISO acknowledge that to submit Bids for Distributed Energy Resource Aggregations to the CAISO through a Scheduling Coordinator, the Distributed Energy Resource Provider must sign this Agreement in accordance with Section 4.17 of the CAISO Tariff.
- 2.3 Distributed Energy Resource Provider Responsibility.** The Distributed Energy Resource Provider acknowledges that it has the responsibility to ensure that it owns, operates, or has sufficient contractual entitlement to provide Energy and/or Ancillary

Services from the Distributed Energy Resource Aggregation(s) it represents in accordance with the CAISO Tariff.

### **ARTICLE III**

#### **TERM AND TERMINATION**

**3.1 Effective Date.** This Agreement shall be effective as of the later of the date it is executed by the Parties or the date accepted for filing and made effective by FERC, if such FERC filing is required, and shall remain in full force and effect until terminated pursuant to Section 3.2 of this Agreement.

#### **3.2 Termination**

**3.2.1 Termination by CAISO.** Subject to Section 5.2, the CAISO may terminate this Agreement by giving written notice of termination in the event that the Distributed Energy Resource Provider commits any material default under this Agreement and/or the CAISO Tariff which, if capable of being remedied, is not remedied within thirty (30) days after the CAISO has given, to the Distributed Energy Resource Provider, written notice of the default, unless excused by reason of Uncontrollable Forces in accordance with Article X of this Agreement; provided, however, that any outstanding financial right or obligation or any other obligation under the CAISO Tariff of the Distributed Energy Resource Provider that has arisen while the Distributed Energy Resource Provider was submitting Bids for Distributed Energy Resource Aggregation(s), and any provision of this Agreement necessary to give effect to such right or obligation, shall survive until satisfied. With respect to any notice of termination given pursuant to this Section, the CAISO must file a timely notice of termination with FERC, if this Agreement was filed with FERC, or must otherwise comply with the requirements of FERC Order No. 2001 and related FERC orders. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the filing of the notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination within sixty (60) days after issuance of the notice of default; or (2) the CAISO files the notice of termination in accordance with the requirements of FERC Order No. 2001. This Agreement shall terminate upon acceptance by FERC of such a notice of termination, if filed with FERC, or thirty (30) days after the date of the CAISO's notice of default, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders.

**3.2.2 Termination by Distributed Energy Resource Provider.** In the event that the Distributed Energy Resource Provider no longer wishes to submit Bids or transmit Energy over the CAISO Controlled Grid, it may terminate this Agreement, on giving the CAISO not less than ninety (90) days written notice, provided, however, that in accordance with Section 4.1.2, the Distributed Energy Resource Provider may eliminate from the Distributed Energy Resource Aggregations(s) which it no longer provides for and such modification shall be effective upon receipt of notice by the CAISO. With respect to any notice of termination given pursuant to this Section, the CAISO must file a timely notice of termination with FERC, if this Agreement has been filed with FERC, or must otherwise comply with the requirements of FERC Order No. 2001 and related FERC orders. The filing of the notice of termination by the CAISO with FERC will be considered timely if: (1) the request to file a notice of termination is made after the preconditions for termination have been met, and the CAISO files the notice of termination within thirty (30) days of receipt of such request; or (2) the CAISO files the notice of termination in accordance with the requirements of FERC Order No. 2001. This Agreement shall terminate upon acceptance by FERC of such a notice of termination, if such notice is required to be filed with FERC, or upon ninety (90) days after the CAISO's receipt of the

Distributed Energy Resource Provider's notice of termination, if terminated in accordance with the requirements of FERC Order No. 2001 and related FERC orders.

## **ARTICLE IV**

### **GENERAL TERMS AND CONDITIONS**

#### **4.1 General Terms and Conditions Applicable to Distributed Energy Resource Providers**

**4.1.1 Distributed Energy Resource Provider Requirements.** A Distributed Energy Resource Provider must satisfy all applicable rules and regulations of the Utility Distribution Company or Metered Subsystem tariffs as well as any requirements of the applicable Local Regulatory Authority, as well as applicable interconnection requirements, if any. A Distributed Energy Resource Provider must ensure that Distributed Energy Resources that comprise its Distributed Energy Resource Aggregation satisfy all applicable rules and regulations of Utility Distribution Company or Metered Subsystem tariffs, any requirements of the Local Regulatory Authority, as well as applicable interconnection requirements, if any. The Distributed Energy Resource Provider must certify to the CAISO that any required agreements between the Distributed Energy Resource Provider and the Load Serving Entities or other agreements required by the Local Regulatory Authority are fully executed.

**4.1.2 Agreement Subject to CAISO Tariff.** The Distributed Energy Resource Provider must comply with all applicable terms of the CAISO Tariff. This Agreement shall be subject to the CAISO Tariff, which shall be deemed to be incorporated herein.

**4.1.3 Obligations relating to Major Incidents.** The Distributed Energy Resource Provider shall promptly provide such information as the CAISO may reasonably require in relation to the CAISO's investigations of operating situations or events, or for the CAISO's reporting to the authorities such as the FERC, California Public Utilities Commission, Western Electricity Coordinating Council, or North American Electric Reliability Corporation.

**4.2.1 Technical Characteristics.** The Distributed Energy Resource Provider has identified the Distributed Energy Resources that it owns, operates, or has a contractual entitlement to as part of a Distributed Energy Resource Aggregation in Schedule 1, as required by Section 4.17 of the CAISO Tariff. The Distributed Energy Resource Provider has also provided to the CAISO in Schedule 1 the required information regarding the capacity and operating characteristics of each of the Distributed Energy Resource Aggregations listed in that schedule. Pursuant to Sections 8.9 and 8.10 of the CAISO Tariff, the CAISO may verify, inspect, and test the capacity and operating characteristics of the Distributed Energy Resource Aggregations identified in Schedule 1.

**4.2.2 Metering and Communication.** Metering requirements for the submittal of Settlement Quality Meter Data for Scheduling Coordinator Metered Entities will be in accordance with Section 10.3 of the CAISO Tariff. Pursuant to Sections 8.4.5 and 8.4.6 of the CAISO Tariff, Distributed Energy Resource Aggregations that are scheduled or bid as qualifying Ancillary Services are required to comply with the CAISO's communication and metering requirements.

**4.2.3 Notification of Changes.** The Distributed Energy Resource Provider shall notify the CAISO of any proposed change(s) to the registration of technical information for its

Distributed Energy Resource Aggregation(s). The CAISO shall confer with the applicable Utility Distribution Company or Metered Subsystem regarding any changes provided about Distributed Energy Resources comprising a Distributed Energy Resource Aggregation(s) pursuant to Section 4.17.4 of the CAISO Tariff and applicable Business Practice Manual. Thereafter, the CAISO will update its Master File in accordance with Section 30.7.3.2 of the CAISO Tariff. Pursuant to Sections 8.9 and 8.10 of the CAISO Tariff, the CAISO may verify, inspect and test the capacity and operating characteristics of the revised information provided. Unless the Distributed Energy Resource fails to test at the values in the proposed change(s), the Distributed Energy Resource Provider's proposed change(s) will become effective upon the effective date for the next scheduled update of the Master File, provided that the Distributed Energy Resource Provider submits the changed information by the applicable deadline and is tested by the deadline. Subject to such notification, this Agreement shall not apply to any Distributed Energy Resources which the Distributed Energy Resource Provider no longer owns, operates or to which it no longer has a contractual entitlement.

#### **4.2.4 Obligations Relating to Energy and Ancillary Services**

**4.2.4.1 Submission of Bids and Self-provided Schedules.** When the Scheduling Coordinator on behalf of the Distributed Energy Resource Provider submits a Bid, the Distributed Energy Resource Provider will, by the operation of this Section 4.2.4.1, warrant to the CAISO that it has the capability to provide that service in accordance with the CAISO Tariff and that it will comply with CAISO Dispatch Instructions for the provision of the service in accordance with the CAISO Tariff.

**4.2.4.2 Ancillary Service Certification.** The Distributed Energy Resource Provider shall not use a Scheduling Coordinator to submit a Bid for the provision of an Ancillary Service or submit a Submission to Self-Provide an Ancillary Service unless the Scheduling Coordinator serving that Distributed Energy Resource Provider is in possession of a current Ancillary Service certificate pursuant to Sections 8.3.4 and 8.4 of the CAISO Tariff.

### **ARTICLE V**

#### **PENALTIES AND SANCTIONS**

**5.1 Penalties.** If the Distributed Energy Resource Provider fails to comply with any provisions of this Agreement, the CAISO shall be entitled to impose penalties and sanctions on the Distributed Energy Resource Provider. No penalties or sanctions may be imposed under this Agreement unless a Schedule or CAISO Tariff provision providing for such penalties or sanctions has first been filed with and made effective by FERC. Nothing in this Agreement, with the exception of the provisions relating to the CAISO ADR Procedures, shall be construed as waiving the rights of the Distributed Energy Resource Provider to oppose or protest any penalty proposed by the CAISO to the FERC or the specific imposition by the CAISO of any FERC-approved penalty on the Distributed Energy Resource Provider.

**5.2 Corrective Measures.** If the Distributed Energy Resource Provider fails to meet or maintain the requirements or its responsibilities set forth in this Agreement and/or the CAISO Tariff, the CAISO shall be permitted to take any of the measures, contained or referenced in the CAISO Tariff, which the CAISO deems to be necessary to correct the situation.

### **ARTICLE VI**

## COSTS

- 6.1 Operating and Maintenance Costs. The Distributed Energy Resource Provider shall be responsible for all its costs incurred in meeting its obligations under this Agreement for the Distributed Energy Resource Aggregation(s) identified in Schedule 1.

## ARTICLE VII

### DISPUTE RESOLUTION

- 7.1 Dispute Resolution. The Parties shall make reasonable efforts to settle all disputes arising out of or in connection with this Agreement. In the event any dispute is not settled, the Parties shall adhere to the CAISO ADR Procedures set forth in Section 13 of the CAISO Tariff, which is incorporated by reference, except that any reference in Section 13 of the CAISO Tariff to Market Participants shall be read as a reference to the Distributed Energy Resource Provider and references to the CAISO Tariff shall be read as references to this Agreement.

## ARTICLE VIII

### REPRESENTATIONS AND WARRANTIES

- 8.1 Authorization to Enter Into Agreement. Each Party represents and warrants that the execution, delivery and performance of this Agreement by it has been duly authorized by all necessary corporate and/or governmental actions, to the extent authorized by law.
- 8.2 Necessary Approvals as to Distributed Energy Resources. The Distributed Energy Resource Provider represents that all necessary leases, approvals, permits, licenses, easements, rights of way or access to install, own and/or operate the Distributed Energy Resource Aggregation(s) for which it will Bid or otherwise act under this Agreement have been obtained by the Distributed Energy Resource Provider prior to submitting technical information to the CAISO.

## ARTICLE IX

### LIABILITY

- 9.1 Liability. The provisions of Section 14 of the CAISO Tariff will apply to liability arising under this Agreement, except that all references in Section 14 of the CAISO Tariff to Market Participants shall be read as references to the Distributed Energy Resource Provider and references to the CAISO Tariff shall be read as references to this Agreement.

## ARTICLE X

### UNCONTROLLABLE FORCES

- 10.1 Uncontrollable Forces Tariff Provisions. Section 14.1 of the CAISO Tariff shall be incorporated by reference into this Agreement except that all references in Section 14.1 of the CAISO Tariff to Market Participants shall be read as a reference to the Distributed Energy Resource Provider and references to the CAISO Tariff shall be read as references to this Agreement.

## ARTICLE XI

## MISCELLANEOUS

- 11.1 Assignments.** Either Party may assign or transfer any or all of its rights and/or obligations under this Agreement with the other Party's prior written consent in accordance with Section 22.2 of the CAISO Tariff. Such consent shall not be unreasonably withheld. Any such transfer or assignment shall be conditioned upon the successor in interest accepting the rights and/or obligations under this Agreement as if said successor in interest was an original Party to this Agreement.
- 11.2 Notices.** Any notice, demand, or request which may be given to or made upon either Party regarding this Agreement shall be made in accordance with Section 22.4 of the CAISO Tariff, provided that all references in Section 22.4 of the CAISO Tariff to Market Participants shall be read as a reference to the Distributed Energy Resource Provider and references to the CAISO Tariff shall be read as references to this Agreement, and unless otherwise stated or agreed shall be made to the representative of the other Party indicated in Schedule 2. A Party must update the information in Schedule 2 of this Agreement as information changes. Such changes shall not constitute an amendment to this Agreement.
- 11.3 Waivers.** Any waiver at any time by either Party of its rights with respect to any default under this Agreement, or with respect to any other matter arising in connection with this Agreement, shall not constitute or be deemed a waiver with respect to any subsequent default or other matter arising in connection with this Agreement. Any delay, short of the statutory period of limitations, in asserting or enforcing any right under this Agreement shall not constitute or be deemed a waiver of such right.
- 11.4 Governing Law and Forum.** This Agreement shall be deemed to be a contract made under, and for all purposes shall be governed by and construed in accordance with, the laws of the State of California, except its conflict of law provisions. The Parties irrevocably consent that any legal action or proceeding arising under or relating to this Agreement to which the CAISO ADR Procedures do not apply, shall be brought in any of the following forums, as appropriate: any court of the State of California, any federal court of the United States of America located in the State of California, or, where subject to its jurisdiction, before the Federal Energy Regulatory Commission.
- 11.5 Consistency with Federal Laws and Regulations.** This Agreement shall incorporate by reference Section 22.9 of the CAISO Tariff as if the references to the CAISO Tariff were referring to this Agreement.
- 11.6 Merger.** This Agreement constitutes the complete and final agreement of the Parties with respect to the subject matter hereof and supersedes all prior agreements, whether written or oral, with respect to such subject matter.
- 11.7 Severability.** If any term, covenant, or condition of this Agreement or the application or effect of any such term, covenant, or condition is held invalid as to any person, entity, or circumstance, or is determined to be unjust, unreasonable, unlawful, imprudent, or otherwise not in the public interest by any court or government agency of competent jurisdiction, then such term, covenant, or condition shall remain in force and effect to the maximum extent permitted by law, and all other terms, covenants, and conditions of this Agreement and their application shall not be affected thereby, but shall remain in force and effect and the Parties shall be relieved of their obligations only to the extent necessary to eliminate such regulatory or other determination unless a court or governmental agency of competent jurisdiction holds that such provisions are not separable from all other provisions of this Agreement.

**11.8 Amendments.** This Agreement and the Schedules attached hereto may be amended from time to time by the mutual agreement of the Parties in writing. Amendments that require FERC approval shall not take effect until FERC has accepted such amendments for filing and made them effective. Nothing herein shall be construed as affecting in any way the right of the CAISO to make unilateral application to FERC for a change in the rates, terms and conditions of this Agreement under Section 205 of the FPA and pursuant to FERC's rules and regulations promulgated thereunder, and the Distributed Energy Resource Provider shall have the right to make a unilateral filing with FERC to modify this Agreement pursuant to Section 206 or any other applicable provision of the FPA and FERC's rules and regulations thereunder; provided that each Party shall have the right to protest any such filing by the other Party and to participate fully in any proceeding before FERC in which such modifications may be considered. Nothing in this Agreement shall limit the rights of the Parties or of FERC under Sections 205 or 206 of the FPA and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein. The standard of review FERC shall apply when acting upon proposed modifications to this Agreement by the CAISO shall be the "just and reasonable" standard of review rather than the "public interest" standard of review. The standard of review FERC shall apply when acting upon proposed modifications to this Agreement by FERC's own motion or by a signatory other than the CAISO or non-signatory entity shall also be the "just and reasonable" standard of review. Schedules 1, and 2 are provided for informational purposes and revisions to those schedules do not constitute a material change in the Agreement warranting FERC review.

**11.9 Counterparts.** This Agreement may be executed in one or more counterparts at different times, each of which shall be regarded as an original and all of which, taken together, shall constitute one and the same Agreement.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be duly executed on behalf of each by and through their authorized representatives as of the date hereinabove written.

**California Independent System Operator Corporation**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**Distributed Energy Resource Provider**

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**SCHEDULE 1**

**SCHEDULE 2**

**NOTICES**

**(Section 11.2)**

**Distributed Energy Resource Provider**

Name of Primary

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code: \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code: \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

**CAISO**

Name of Primary

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code: \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

Name of Alternative

Representative: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip Code: \_\_\_\_\_

Email Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax No: \_\_\_\_\_

SCHEDULE 3

CAISO IMPOSED PENALTIES AND SANCTIONS

[Section 5.1]

TO BE INSERTED UPON FERC APPROVAL

**Attachment C**

**Board of Governors Decision  
Expanding Metering and Telemetry Options  
July 2015**

**Distributed Energy Resource Provider Initiative  
California Independent System Operator Corporation**



# Memorandum

**To:** ISO Board of Governors

**From:** Keith Casey, Vice President, Market and Infrastructure Development

**Date:** July 9, 2015

**Re:** **Decision on expanding metering and telemetry options**

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*This memorandum requires Board action.*

## EXECUTIVE SUMMARY

Distributed energy resources will represent an increasingly important part of the future resource mix. Effectively integrating these resources into the ISO market and operations will help to lower carbon emissions and provide operational benefits to the ISO grid. With this proposal, Management is seeking to facilitate these resources' participation in the ISO market, consistent with reliable system operations.

Currently, the ISO's tariff does not offer a clear platform for smaller distribution connected resources such as rooftop solar, energy storage, and plug-in electric vehicles to participate effectively in the ISO market. To open a pathway for these resources to participate, the ISO is taking the first step by establishing a framework to enable distributed energy resources to aggregate together to meet the ISO's 0.5 MW minimum participation requirement.

Another key advance of this proposed aggregation framework is that these aggregations will be scheduling coordinator metered entities. Under this approach, the metering arrangement is between the scheduling coordinator and the resource – rather than between the ISO and the resource – and the scheduling coordinator submits settlement quality meter data to the ISO for settlement purposes. This construct avoids having each sub-resource in an aggregation engaged in a direct metering relationship with the ISO, which could create a significant burden for these aggregations and their sub-resources.

To ensure that the ISO can implement this framework quickly, Management is proposing to rely on existing market models and tariff rules to the maximum extent possible. Taking this approach means that the ISO and market participants can avoid major market system changes and the associated time required to implement those changes. This approach also means that this first step comes with some limitations.

That said, Management will explore further enhancements to offer greater flexibility to distributed energy resources seeking to participate in the ISO market. The ISO will explore some of these enhancements with stakeholders this year under the energy storage and distributed energy resources initiative, and others in 2016 and beyond as the ISO gains operational experience with distributed energy resource aggregations.

Management recommends the following motion:

***Moved, that the ISO Board of Governors approves the proposal for expanding metering and telemetry options, as described in the memorandum dated July 9, 2015; and***

***Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.***

## **DISCUSSION AND ANALYSIS**

For purposes of this proposal, a distributed energy resource is any distribution connected resource, regardless of size or whether it is connected behind or in front of the end-use customer meter. Distribution connected means connected to distribution facilities controlled by a distribution utility, regardless of voltage level, and served by the ISO grid. Examples of distributed energy resources include, but are not limited to, rooftop solar, energy storage, and plug-in electric vehicles.

Under the proposed framework, aggregations of distributed energy resources may be at a single pricing node<sup>1</sup> or across multiple pricing nodes, but must be within a single sub load aggregation point.<sup>2</sup> There is no limit on the number of pricing nodes within a sub load aggregation point that may compromise a single aggregation of distributed energy resources. There is no minimum size limitation on the individual sub-resources in an aggregation.

For aggregations limited to one pricing node, there is no maximum size limitation. Sub-resources may be heterogeneous – that is, a mixture of sub-resource types. For aggregations limited to one pricing node all of the sub-resources do not need to move in the same direction as the ISO dispatch instruction; rather, it is only necessary that the net movement of the aggregate of the sub-resources equate to the ISO dispatch instruction.

However, for aggregations across multiple pricing nodes, Management is proposing several limitations that are necessary to limit the adverse effects that such aggregations may have on the ISO's ability to accurately assess congestion and identify critical

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<sup>1</sup> A pricing node is a single network node where a physical injection or withdrawal is modeled and for which a locational marginal price is calculated and used for financial settlements.

<sup>2</sup> A sub load aggregation point is an ISO defined subset of pricing nodes within a default load aggregation point.

constraints. First, these aggregations may not exceed 20 MW. Second, all sub-resources must be homogenous and must move in the same direction as the ISO dispatch instruction. Third, for aggregations of energy storage, all sub-resources must be operating in the same mode (that is, charging or discharging, but not a mix of the two) in response to an ISO dispatch instruction. Management recognizes that this initial framework may make aggregations at a single pricing node more attractive, but the limitations Management is proposing for aggregations across multiple pricing nodes are appropriate until the ISO understands the congestion management impacts of distributed energy resource aggregations.

Under this proposed framework, a “distributed energy resource provider” would be the owner/operator of one or more aggregations of individual distributed energy resources. A distributed energy resource provider will be a new type of market participant, analogous to a participating generator or a participating load. A distributed energy resource provider will, among other things, provide the ISO with accurate information about the sub-resources in an aggregation and will timely update this information when changes to these resources occur. The distributed energy resource provider will be responsible for operating and maintaining its sub-resources consistent with applicable provisions of the tariff and must comply with applicable outage requirements as well as any applicable reliability criteria. The provider must also comply with applicable utility distribution company tariffs, requirements of the applicable local regulatory authority, as well as interconnection requirements. Aggregations would participate in the ISO’s energy and/or ancillary services market through a scheduling coordinator. The provider could serve as its own scheduling coordinator or hire the services of a scheduling coordinator.

Management proposes to create a pro forma distributed energy resource provider agreement to establish the terms and conditions under which the ISO and distributed energy resource provider will discharge their respective duties and responsibilities under the tariff. This agreement would identify every sub-resource subject to the agreement as part of a schedule to the agreement. Each provider, regardless of how many aggregations it has, will only execute a single agreement. Under this arrangement, individual sub-resources in an aggregation must participate in the ISO market as part of the aggregation and not as individual resources.

## **POSITIONS OF THE PARTIES**

Most stakeholders either fully support, or support with qualification, Management’s proposal to establish a framework for distributed energy resources to aggregate together to meet the ISO’s 0.5 MW minimum participation requirement. These stakeholders generally support the proposal as an important first step toward enabling the participation of distribution connected resources in the ISO market. Some stakeholders also sought clarification on a number of issues and two stakeholders expressed opposition to the proposal. A detailed stakeholder comment matrix is attached.

## **CONCLUSION**

Management recommends that the Board approve the distributed energy resource aggregation proposal described in this memorandum. The proposal is a prudent first step in advancing the ability of distribution connected resources to participate in the ISO market.

**Stakeholder Process: Expanding Metering and Telemetry Options****Summary of Submitted Comments**

Stakeholders submitted three rounds of written comments to the ISO on the following dates:

- Round One, 11/20/14
- Round Two, 05/27/15
- Round Three, 06/24/15

Stakeholder comments are posted at: <http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=66A6B052-E2D5-48C7-89C4-9414B36C0001>

Other stakeholder efforts include:

- Web conference, 11/13/14
- Web conference, 05/19/15
- Web conference, 06/17/15

Management proposal	SolarCity, Stem, and Advanced Micro-Grid Solutions	Wooster Engineering Specialties	Ohm Connect	Management response
<p>Enable distributed energy resources to aggregate together with certain restrictions, at a single pricing node or across multiple pricing nodes, within a single sub load aggregation point to meet the ISO's 0.5 MW minimum participation requirement.</p>	<p>Support with qualification.</p> <p>Request that future initiatives consider relaxing or eliminating the restrictions on heterogeneous aggregations across multiple pricing nodes.</p> <p>Request clarification on the interconnection process for distributed energy resource aggregations and request clarification about multi-use resources.</p>	<p>Support.</p> <p>Requests clarification about dual use resources.</p>	<p>Did not specify position.</p> <p>Believes that some flexibility to mix sub-resource types in an aggregation without compromising the ISO's reliable modeling and operation of the grid.</p>	<p>In response to concerns about the limitations described in the proposal, Management responds that they are necessary to limit the adverse effects that aggregations across multiple nodes may have on the ISO ability to accurately assess congestion and identify critical constraints, they encourage the ISO to consider further enhancements in future stakeholder initiatives. Management will consider reevaluating the appropriateness of these limitations after gaining a full 12 months of operational experience with several aggregations of between 10 and 20 MW across multiple pricing nodes. Until such time as the ISO has gained this experience, Management believes these limitations represent a prudent and reasonable starting place.</p> <p>Management responds to issues raised about multi-use or dual-use resources by clarifying that these issues will be explored in the energy storage and distributed energy resources ("ESDER") initiative. More information about this initiative is available on the ISO's website at <a href="http://www.aiso.com/informed/Pages/StakeholderProcesses/EnergyStorage_AggregatedDistributedEnergyResources.aspx">http://www.aiso.com/informed/Pages/StakeholderProcesses/EnergyStorage_AggregatedDistributedEnergyResources.aspx</a></p> <p>Management responds to issues raised about interconnection processes for distributed energy resources by clarifying that it is the distribution utility and not the ISO that specifies and administers the connection of resources to a distribution system. Management further clarifies that the distributed energy resource provider must comply with applicable utility distribution company tariffs and requirements of the applicable local regulatory authority, in addition to interconnection requirements. Also, prior to participating in the ISO market a distributed energy resource provider would need to successfully complete the ISO new resource implementation process for its aggregation and this process includes verification that the interconnections for the sub-resources in an aggregation have been approved by the appropriate distribution utility.</p>

Management proposal	MelRok	Pacific Gas & Electric	California Energy Storage Alliance	Olivine	Management response
<p>Enable distributed energy resources to aggregate together with certain restrictions, at a single pricing node or across multiple pricing nodes, within a single sub load aggregation point to meet the ISO's 0.5 MW minimum participation requirement.</p>	<p>Fully supports.</p> <p>Requests clarification if distributed energy resources are limited to renewables or can also include fuel-based generation such as biomass or fuel cells. Requests clarification about dual use resources.</p>	<p>Support with qualification.</p> <p>Believes that there are issues associated with aggregation of behind-the-retail-meter distributed energy resources that should be resolved in a third phase of this initiative carried forward in conjunction with local regulatory authorities. Believes that these issues should be resolved prior to implementing an aggregation framework for behind-the-retail-meter distributed energy resources.</p>	<p>Strongly supports, with qualification.</p> <p>Requests further efforts to define metering and telemetry configurations that will allow distributed energy resources to participate both behind and in front of the retail meter. Requests clarification on multi-use resources.</p>	<p>Fully supports.</p> <p>Believes that issues must still be resolved at the distribution, retail, and local regulatory authority levels. Encourages ISO to work with the CPUC and other local regulatory authorities on metering requirements for distributed energy resources.</p>	<p>Regarding what comprises distributed energy resources, Management clarifies that for purposes of this proposal a distributed energy resource means any distribution connected resource and is not limited to renewables.</p> <p>In response to concerns raised about unresolved issues at the distribution, retail, and local regulatory authority levels, Management clarifies that the distributed energy resource provider must comply with applicable utility distribution company tariffs, requirements of the applicable local regulatory authority, as well as interconnection requirements. To the extent that in some cases such rules or requirements may either need further clarification or be developed to enable distributed energy resources (especially those behind-the-retail-meter or end-use meter customer meter) to take advantage of Management's proposed aggregation framework, Management believes its proposal is an important first step to open a pathway for these resources to participate and should not wait until every issue at the distribution, retail, and local regulatory level is resolved. To be very clear, Management's proposal does not mandate that all distributed energy resources enter into an aggregation. Rather, Management's proposal simply establishes a framework for distributed energy resources to aggregate together to meet the ISO's 0.5 MW minimum participation requirement if they elect to do so and if rules and requirements at the distribution, retail, and local regulatory levels allow them to do so.</p> <p>See Management's previous response to the multi-use issue.</p>

Management proposal	Californians for Renewable Energy	TeMix	Management response
<p>Enable distributed energy resources to aggregate together with certain restrictions, at a single pricing node or across multiple pricing nodes, within a single sub load aggregation point to meet the ISO's 0.5 MW minimum participation requirement.</p>	<p>Oppose.</p> <p>Opposes the proposal on the grounds that it is not offering customer-generators a mechanism to transition to a standard contract or tariff that complies with Public Utility Regulatory Policies Act of 1978.</p>	<p>Oppose.</p> <p>States three reasons for opposing the proposal: (1) it is extremely complex; (2) it requires aggregation of most distributed energy resources; and (3) it is the first step toward a distribution system operator that extends the ISO span of control to the dispatch of distributed energy resources.</p>	<p>Management responds that CARE's comments misapprehend the proposal, which seeks to establish a mechanism for distributed energy resources to offer their output into the ISO's wholesale markets through an aggregation arrangement, if they elect to do so. The proposal does not mandate that all distributed energy resources enter into an aggregation and does not substitute for any requirements under PURPA. CARE's comments also suggest that the ISO is subject to other requirements of California Assembly Bill 327 enacted in 2013 that pertains to net metering for eligible customer-generators. That is not the case. The relevant provisions of Assembly Bill 327 cited by CARE apply to large electrical corporations subject to the jurisdiction of the California Public Utilities Commission.</p> <p>Management responds to TeMix's comments that its proposal is (1) relatively simple in that it relies on existing market models and tariff rules to the maximum extent possible and avoids major market system changes; (2) responsive to developers of small distributed energy resources who have requested an aggregation framework enabling their market participation; and (3) limits its dispatch control to the aggregated single market resource modeled at pricing nodes on the ISO grid, not the distribution grid.</p>



# Decision on expanding metering and telemetry options initiative (aggregation of distributed energy resources)

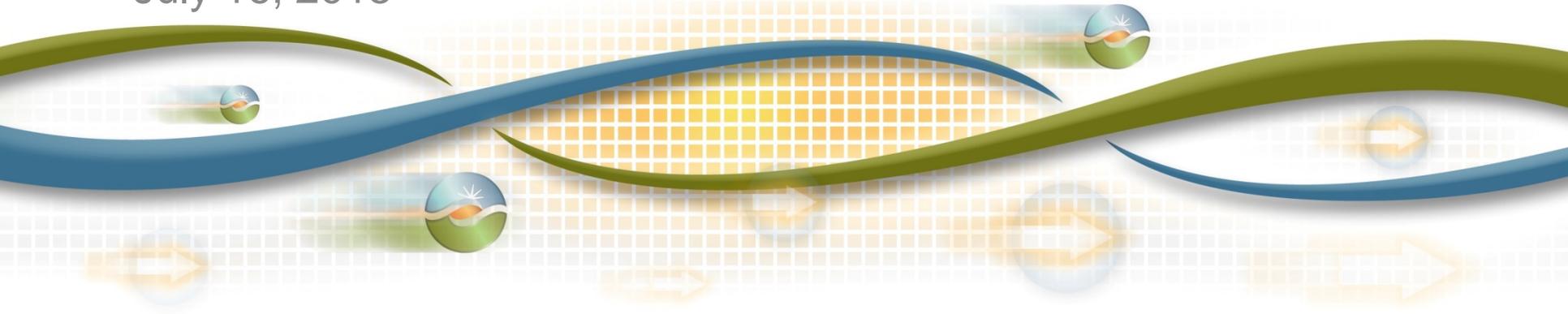
Tom Flynn

Infrastructure Policy Development Manager

Board of Governors Meeting

General Session

July 16, 2015



# Proposal provides new provisions to enable distribution connected resources to participate in ISO market.

- Distribution connected resources are becoming an increasingly important part of resource mix.
- ISO's tariff does not offer a clear platform for smaller distribution connected resources to participate in ISO markets.
- Creating a pathway for these resources to participate in the ISO market will help lower carbon emissions and provide operational benefits.

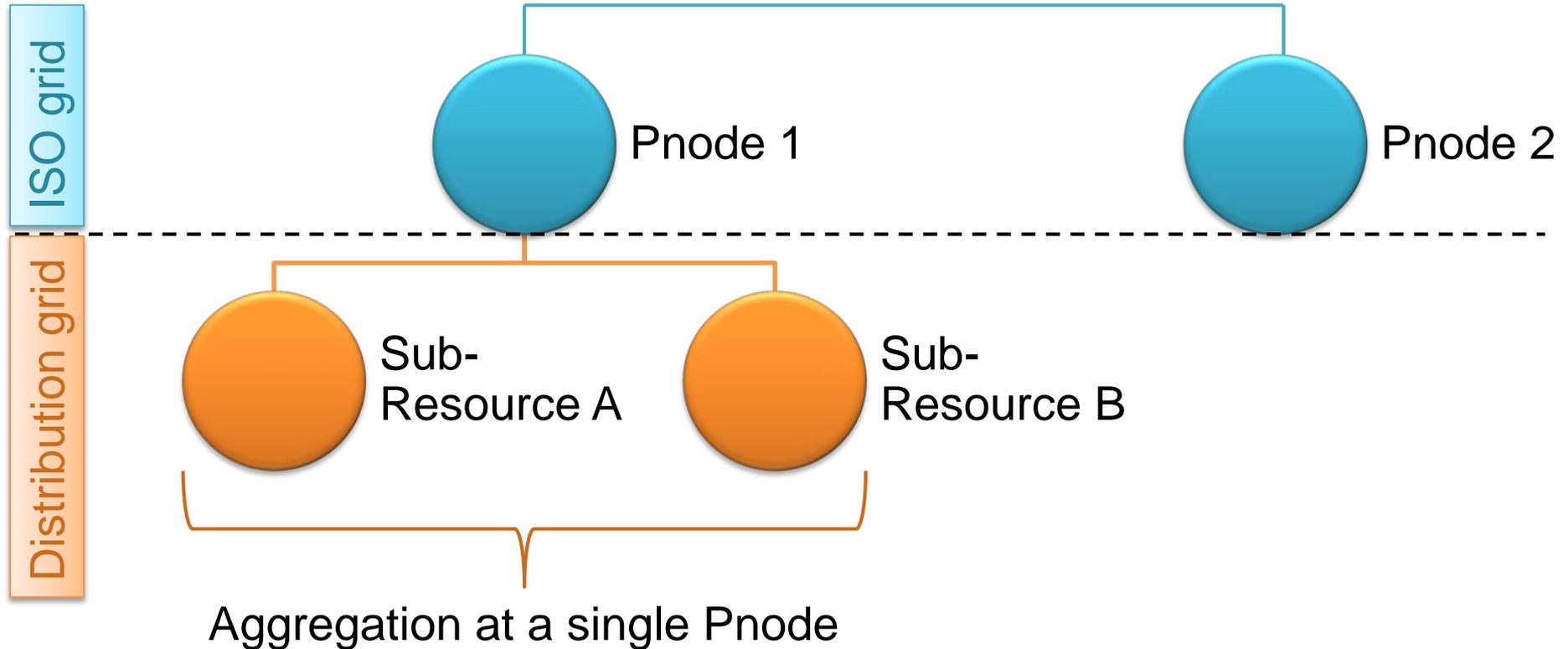
Proposal allows aggregations of distribution connected resources to participate in the ISO market as a single market resource.

- Includes distribution resources connected behind or in front of the end-use customer meter.
- Allows sub resources to be scheduling coordinator metered entities.
  - Avoids having each sub-resource in an aggregation engaged in a direct metering relationship with the ISO.
- Resources must comply with applicable utility distribution company tariffs and requirements of the local regulatory authority.

Proposal limits geographic dispersion of an aggregation of distribution connected resources to meet ISO operational needs.

- Aggregations of distribution connected resources may be at a single pricing node or across multiple pricing nodes.
- Each resource aggregation must be within a single sub load aggregation point.
- Different rules apply to single versus multiple pricing node aggregations to accurately predict congestion effects.

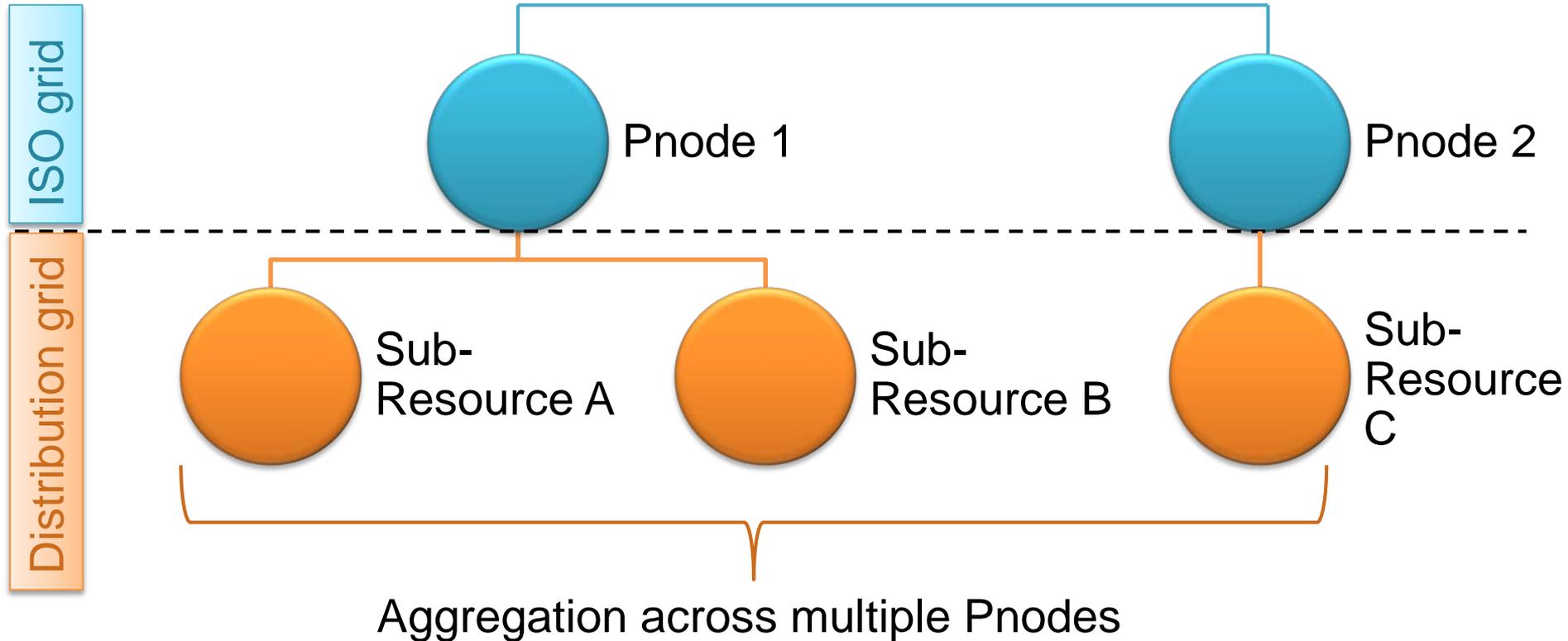
# Illustration of an aggregation at a single pricing node.



For aggregations limited to a single pricing node, greater flexibility is provided due to predictability of its effect on congestion management.

- No maximum size limitation.
- A mixture of sub-resource types is allowed.
- All sub-resources do not have to move in the same direction as the ISO dispatch instruction.

# Illustration of an aggregation across multiple pricing nodes.



For aggregations across multiple pricing nodes, additional rules are needed to limit adverse effects on ISO's ability to accurately predict congestion.

- Aggregations may not exceed 20 MW.
- Sub-resources must be homogenous and must move in the same direction as the ISO dispatch instruction.
- Energy storage aggregations must have all sub-resources operating in the same mode (i.e., charging or discharging) in response to an ISO dispatch instruction.

Stakeholders generally support the proposal but some seek greater flexibility for aggregations across multiple pricing nodes.

- In taking this first step, Management's proposal relies on existing market models and tariff rules to the maximum extent possible.
- Management will reevaluate appropriateness of the 20 MW limitation after gaining operational experience with several aggregations of sufficient size.
- Management will reassess the other limitations in the energy storage and distributed energy resources stakeholder initiative in 2016.

Management recommends that the Board approve the proposal.

- Acknowledges that distribution connected resources represent an increasingly important part of the future resource mix.
- Opens a pathway for these resources to aggregate together to meet the ISO's 0.5 MW minimum participation requirement.
- Supported by a majority of stakeholders.



Board of Governors  
General Session

July 16, 2015

Decision on expanding metering and telemetry options initiative

**Motion**

Moved, that the ISO Board of Governors approves the proposal for expanding metering and telemetry options, as described in the memorandum dated July 9, 2015; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.

Moved: Galiteva      Second: Ferron

Board Action:	<b>Passed</b>	Vote Count:	<b>4-0-0</b>
Bhagwat	Not present		
Ferron	Y		
Galiteva	Y		
Mullin	Y		
Olsen	Y		

**Motion Number: 2015-07-G2**

**Attachment D**

**Board of Governors Decision  
Expanding Metering and Telemetry Options  
December 2015**

**Distributed Energy Resource Provider Initiative  
California Independent System Operator Corporation**



# Memorandum

**To:** ISO Board of Governors

**From:** Keith Casey, Vice President, Market and Infrastructure Development

**Date:** December 10, 2015

**Re:** **Decision on expanding metering and telemetry options – distributed energy resources provider**

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*This memorandum requires Board action.*

## EXECUTIVE SUMMARY

The Board of Governors approved a framework for aggregations of distributed energy resources to participate in the ISO market at its July 16, 2015 meeting. Consistent with the Board's direction from that meeting, Management is developing tariff revisions to integrate distributed energy resource aggregations into the ISO market. During this effort, Management has reviewed certain limitations it initially proposed to apply to distributed energy resource aggregations, and no longer believes they are necessary. Specifically, in its earlier request to the Board, Management proposed certain limits for distributed energy resource aggregations that span multiple pricing nodes to mitigate the adverse effects these aggregations may have on the ISO's ability to accurately assess congestion and identify critical constraints on the transmission system. Management requests that the Board authorize it to eliminate two of these limitations and replace them with less restrictive rules.

Management will continue to explore further enhancements to offer greater flexibility to distributed energy resources seeking to participate in the ISO market. The ISO is exploring some of these enhancements with stakeholders this year under the energy storage and distributed energy resources initiative, and will explore others in 2016 and beyond as the ISO gains operational experience with distributed energy resource aggregations.

Management recommends the following motion:

**Moved, that the ISO Board of Governors approves the proposed revisions for expanding metering and telemetry options – distributed energy resources provider, as described in the memorandum dated December 10, 2015; and**

**Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.**

## **DISCUSSION AND ANALYSIS**

Under the proposed framework approved by the Board at its July 16 meeting, aggregations of distributed energy resources may be at a single pricing node<sup>1</sup> or across multiple pricing nodes, but must be within a single sub-load aggregation point.<sup>2</sup>

This framework allows heterogeneous sub-resources to aggregate at one pricing node. The framework also permits sub-resources located at one pricing node to move in different directions so long as the net response at the pricing node is consistent with the ISO dispatch instruction. However, for aggregations across multiple pricing nodes, the Board approved framework requires that all sub-resources that comprise a distributed energy resource aggregation must be homogenous and must move in the same direction as the ISO dispatch instruction. In addition, the approved framework requires that, for energy storage aggregations across multiple pricing nodes, all sub-resources must operate in the same mode (that is, charging or discharging, but not a mix of the two) in response to an ISO dispatch instruction.

As part of its initial implementation efforts, the ISO has reassessed the limits described above that would apply to aggregations across multiple pricing nodes, and no longer believes they are necessary to manage congestion and other transmission constraints. These limits are not necessary so long as aggregations of distributed energy resources provide a net response at the pricing node level that is consistent with the ISO dispatch instruction and consistent with applicable distribution factors that the aggregation submits with its bid. For example, in a two-pricing node aggregation with distribution factors of 0.2 and 0.8, an aggregated resource's net response would have to be 20 percent of the total aggregation output at one pricing node and 80 percent at the other pricing node. The ISO, however, will continue to maintain a 20 MW size limit for distributed energy resource aggregations across multiple pricing nodes.

## **POSITIONS OF THE PARTIES**

Management initially presented and discussed the proposed less restrictive requirements with stakeholders through the tariff development process that ensued subsequent to the July Board meeting. To ensure a robust stakeholder process around

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<sup>1</sup> A pricing node is a single network node where a physical injection or withdrawal is modeled and for which a locational marginal price is calculated and used for financial settlements.

<sup>2</sup> A sub-load aggregation point is an ISO defined subset of pricing nodes within a default load aggregation point.

these proposed enhancements, Management also produced a supplemental white paper with illustrative examples, held a stakeholder call, and invited another round of written stakeholder comments. Several stakeholders fully support the proposed enhancements. Two other stakeholders expressed some reservations about whether distributed energy resource aggregations will perform in accordance with their distribution factors, while a third raises concerns surrounding dual use (provision of retail and wholesale service by the same resource).

Management believes its proposal addresses the performance concerns raised by some stakeholders. First, Management will propose a tariff requirement that a distributed energy resource aggregation must provide a net response at its constituent pricing node(s) that is consistent with ISO dispatch instructions and applicable generation distribution factors. Second, the tariff metering provisions will require a scheduling coordinator for a distributed resource aggregation to conduct annual self-audits and the ISO will have the authority to perform audits at any time. Third, Management will propose a tariff requirement that distributed energy resource providers must make settlement quality meter data from individual distributed energy resources comprising an aggregation available to the ISO upon request. Fourth, for aggregations of 10 MW or greater and for those as small as 1 MW providing ancillary services, the ISO will know in real-time whether its response is consistent with the applicable distribution factors since it must provide telemetry at the pricing node level in accordance with the ISO's standards for telemetry. Regarding one stakeholder concern about dual use, Management notes that these issues were previously considered when the Board approved Management's proposal in July. Management will propose a tariff requirement that aggregations must comply with applicable utility distribution company tariffs and requirements of the applicable local regulatory authority. Management also points out that dual use issues are separately being explored in the ISO's energy storage and distributed energy resources stakeholder initiative as well the CPUC's energy storage proceeding.

Management will continue to explore additional enhancements as the ISO gains operational experience with distributed energy resource aggregations. These enhancements may include changes to telemetry and/or metering requirements for DER aggregations. Management provides a more detailed response to these issues in Attachment A.

## **CONCLUSION**

Management recommends that the Board approve the modification to the distributed energy resource aggregation proposal described in this memorandum. The proposal will increase the flexibility for distribution-connected resources to participate in the ISO market.

## **Stakeholder Process: Expanding Metering and Telemetry Options – Distributed Energy Resources Provider**

### **Summary of Submitted Comments**

**Stakeholders submitted six rounds of written comments to the ISO on the following dates:**

- Round One (comments on Straw Proposal), 11/20/14
- Round Two (comments on Revised Straw Proposal), 05/27/15
- Round Three (comments on Draft Final Proposal), 06/24/15
- Round Four (comments on draft tariff language), 09/29/15
- Round Five (comments on revised draft tariff language), 10/21/15
- Round Six (comments on Supplement to the Draft Final Proposal), 11/17/15

**Stakeholder comments on policy papers are posted at:** <http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=66A6B052-E2D5-48C7-89C4-9414B36C0001>

**Stakeholder comments on proposed tariff language are posted at:** <http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=BAA9EEB9-0DC6-4737-B0B8-31F5B775210A>

**Other stakeholder efforts include:**

- Stakeholder call on Straw Proposal, 11/13/15
- Stakeholder call on Revised Straw Proposal, 05/19/15
- Stakeholder call on Draft Final Proposal, 06/17/15
- Stakeholder call on draft tariff language, 10/01/15
- Stakeholder call on revised draft tariff language, 10/29/15
- Stakeholder call on Supplement to the Draft Final Proposal, 11/17/15

Management proposal	California Energy Storage Alliance	Pacific Gas and Electric Company	Powertree Services	San Diego Gas & Electric	Southern California Edison	SolarCity	Management response
<p>Replace certain prior Board-approved limitations on distributed energy resource (DER) aggregations across multiple pricing nodes with less restrictive rules.</p>	<p>Support.</p> <p>Less restrictive rules will expand market access to a wider array of DER aggregations without negative effects on congestion or system reliability.</p>	<p>Oppose with qualification.</p> <p>Concerned that resources will not respond according to their distribution factors. Recommends that the ISO implement a MW cap on total DER aggregation participation for a period of two years and that the ISO should publish audit results to allay concerns about market manipulation by DER aggregations.</p>	<p>Support.</p> <p>The proposal reflects the necessary structures to achieve market entry and operational viability for aggregated DERs.</p>	<p>Support with qualification.</p> <p>Recommends an initial limitation on the overall volume of DERs participating in the wholesale market to allow for the CPUC, ISO, and investor-owned utilities to gain experience and ensure that dual usage of DERs is adequately addressed.</p>	<p>Conditional.</p> <p>Recommends (1) the ISO develop rules that require DER aggregations to reasonably perform in accordance with their distribution factors and (2) that the ISO make the proposal interim (e.g., two years) while real time mechanism is developed to verify distribution factors match performance.</p>	<p>Support.</p> <p>The proposed enhancements are a major step forward and will expand the market to allow DERs to effectively participate in the ISO market with no negative market outcomes.</p>	<p>Management believes it has addressed the issues raised by Pacific Gas and Electric Company and Southern California Edison for the following reasons. First, Management will propose a tariff requirement that a distributed energy resource aggregation must provide a net response at its constituent pricing node(s) that is consistent with ISO dispatch instructions and applicable generation distribution factors. Second, distributed energy resource aggregations are scheduling coordinator metered entities (SCME), thus the scheduling coordinator for an aggregation is required to conduct annual self-audits and the ISO will have the authority to perform audits at any time. Management will explain the scope/requirements of the self-audit in the ISO's Business Practice Manuals. Third, Management will propose a tariff requirement that distributed energy resource providers must make settlement quality meter data from individual distributed energy resources comprising an aggregation available to the ISO upon request. Fourth, for aggregations of 10 MW or greater and for those as small as 1 MW providing ancillary services, the ISO will know in real-time whether its response is consistent with the applicable distribution factors since it must provide telemetry at the pricing node level in accordance with the ISO's standards for telemetry.</p> <p>Rather than implementing a total cap on distributed energy resource aggregation participation or making its proposal interim, Management intends to utilize the means described above to monitor the market behavior of DER aggregations relative to applicable distribution factors, and where there is unreasonable divergence, take appropriate action as necessary.</p>

Management proposal	California Energy Storage Alliance	Pacific Gas and Electric Company	Powertree Services	San Diego Gas & Electric	Southern California Edison	SolarCity	Management response
							<p>Regarding SDG&amp;E's concerns about dual use, Management responds that these issues were previously considered when the Board approved Management's proposal in July. Management will propose a tariff requirement that aggregations must comply with applicable utility distribution company tariffs and requirements of the applicable local regulatory authority. Management also points out that dual use issues are separately being explored in the ISO's energy storage and distributed energy resources ("ESDER") stakeholder initiative as well the CPUC's energy storage proceeding.</p> <p>Management will continue to explore additional enhancements as the ISO gains operational experience with distributed energy resource aggregations. These enhancements may include changes to telemetry and/or SCME requirements for DER aggregations.</p>



# Decision on expanding metering and telemetry options (distributed energy resources provider)

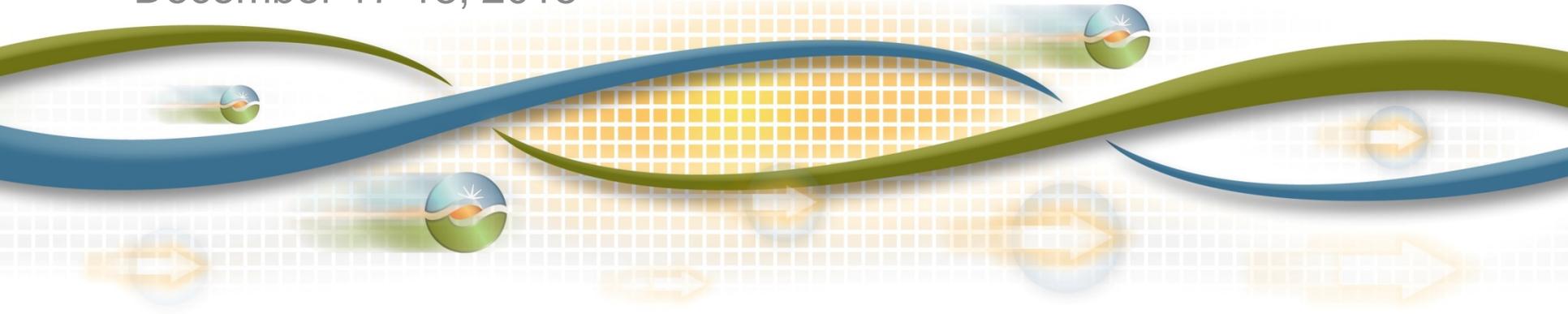
Tom Flynn

Storage & Distributed Energy Resource Policy Manager

Board of Governors Meeting

General Session

December 17-18, 2015



Limitations are needed on aggregations across multiple pricing nodes to maintain ability to manage congestion

**Approved rules focus on sub-resource level**

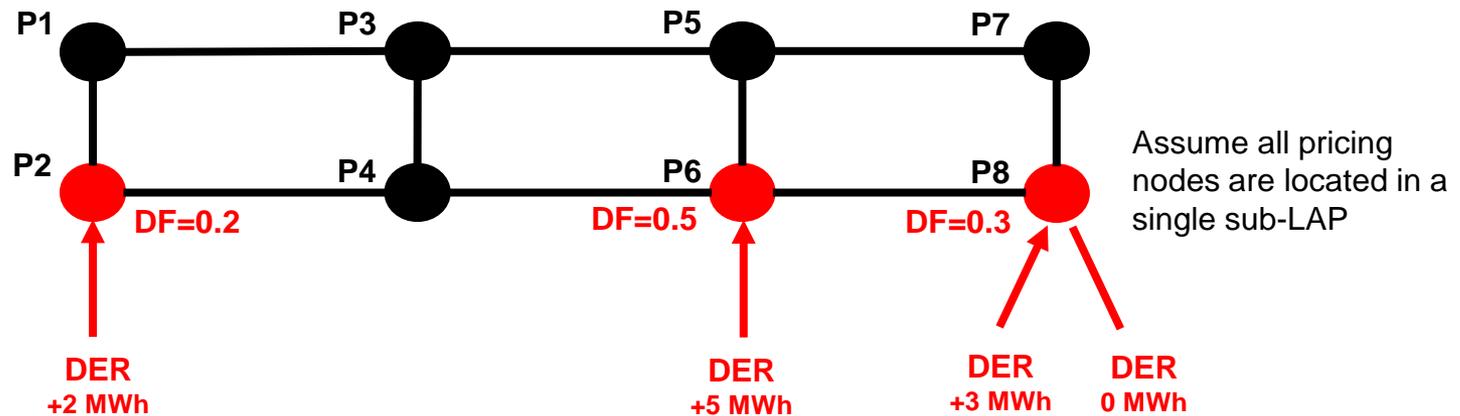
All sub-resources:

- Must be of single resource type
- Must move in the same direction
- Must operate in the same mode for storage aggregations

**Proposed new rules focus on pricing node level**

Net response at each pricing node must be consistent with dispatch instruction and distribution factors

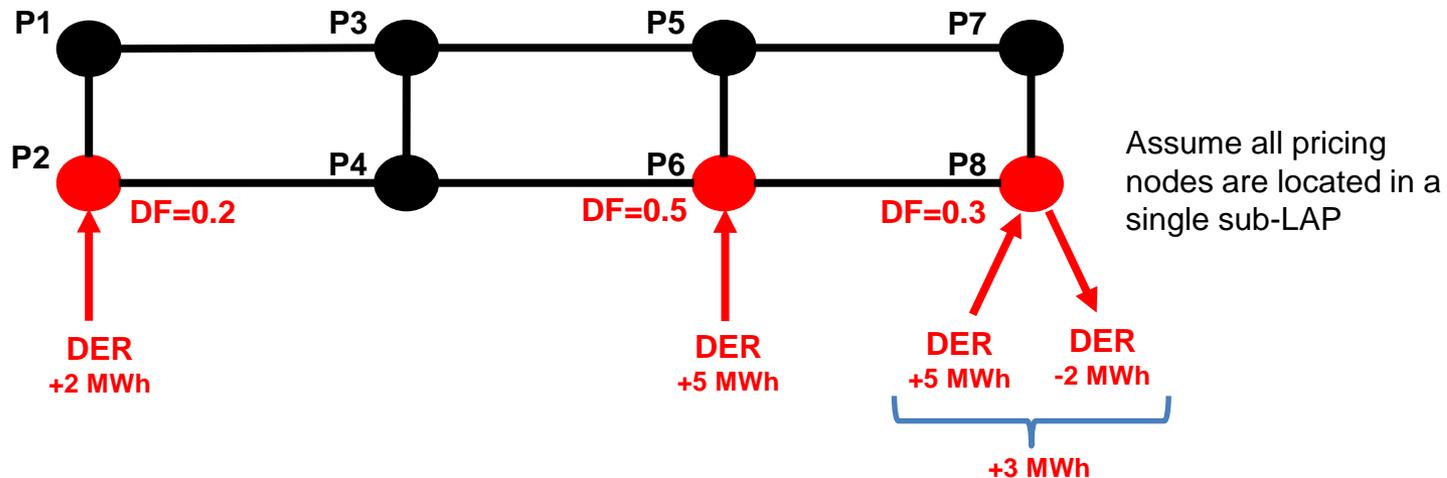
Example 1: Assume an aggregation of DER distributed across pricing nodes 2, 6 and 8.



If this aggregation gets an ISO dispatch instruction to increase output by 10 MWh, then the net response at each pricing node must be:

- +2 MWh at P2
- +5 MWh at P6
- +3 MWh at P8

## Example 2: Same as previous example except sub-resources at P8 are moving in opposite directions



If this aggregation gets an ISO dispatch instruction to increase output by 10 MWh, then the net response at each pricing node must be same as previous example:

- +2 MWh at P2
- +5 MWh at P6
- +3 MWh at P8

Many stakeholders support these enhancements while some express reservations.

- Advocates and potential aggregators of distributed energy resources are very supportive.
- Distribution utilities express some reservations and concerns.
- CPUC President Picker and Commissioner Florio express support.

Management recommends that the Board approve the proposed enhancements.

- Increases flexibility for multi-pricing node aggregations to participate in the ISO market.
  - Mixing of sub-resource types would be allowed
  - Sub-resources may move in different directions
  - Storage sub-resources may operate in different modes
- Supported by many stakeholders.
- Accommodates future distribution business and/or regulatory models, including potentially a distribution system operator.



Board of Governors December 17-18, 2015

Decision on expanding metering and telemetry options (distributed energy resources provider)

General Session

**Motion**

Moved, that the ISO Board of Governors approves the proposed revisions for expanding metering and telemetry options – distributed energy resources provider, as described in the memorandum dated December 10, 2015; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.

Moved: Ferron Second: Bhagwat

Board Action: <b>Passed</b> Vote Count: <b>4-0</b>	
Bhagwat	Y
Ferron	Y
Galiteva	Y
Mullin	Not present
Olsen	Y

Motion Number: 2015-12-G4

**Attachment E**

**Matrix of DERP Tariff Revisions**

**Distributed Energy Resource Provider Initiative  
California Independent System Operator Corporation**

**Matrix of Tariff Revisions**  
**Distributed Energy Resource Provider Initiative**

<b>Tariff Section</b>	<b>Proposed Change</b>	<b>Justification</b>
4.2.1	Identify distributed energy resource providers as market participants that must comply with CAISO dispatch instruction and operating orders.	This revision identifies distributed energy resource providers on a list of other market participants that must adhere to an existing tariff provision to comply fully and promptly with CAISO dispatch instructions and operating orders, unless such operation would impair public health or safety. This requirement supports the reliable operation of the transmission system.
4.13	Specify that Reliability Demand Response Resources and Proxy Demand Resources may not participate in a Distributed Energy Resource Aggregation.	This revision ensures that resources electing to participate in the CAISO’s markets as a Reliability Demand Response Resource or a Proxy Demand Resource do not also participate in a Distributed Energy Resource Aggregation. This provision will ensure the CAISO does not double count a resource’s capacity as a market resource or provide double payments to the same resource.
4.17.1	<p>Require a distributed energy resource provider to represent each distributed energy resource aggregation.</p> <p>Require that a distributed energy resource provider enter into a distributed energy resource provider agreement.</p> <p>Require distributed energy resource providers to participate in the CAISO’s market through a scheduling coordinator.</p>	<p>This revision reflects similar requirements that apply to all market participants. All market participants must use a scheduling coordinator to participate in the CAISO’s markets and sign an agreement that binds the market participant to the CAISO tariff. In addition, this revision ensures that all distributed energy resource aggregations (<i>i.e.</i>, the resources) seeking to participate in the CAISO market are represented by a market participant – a distributed energy resource provider.</p>

<b>Tariff Section</b>	<b>Proposed Change</b>	<b>Justification</b>
4.17.2(a)	Require distributed energy resource providers to operate and maintain their distributed energy resource aggregations consistent with applicable provisions of the CAISO tariff.	This revision seeks to ensure that distributed energy resource providers operate their market resources consistent with applicable tariff rules. The CAISO imposes the same requirement on other market participants. ( <i>See, e.g.</i> , CAISO tariff section 4.6.1.1.)
4.17.2(b)	<p>Require distributed energy resource providers to operate and maintain their distributed energy resource aggregations (and distributed energy resources comprising their aggregations) consistent with applicable utility distribution company or metered subsystem tariffs and operating procedures incorporated therein.</p> <p>Require distributed energy resource providers to operate and maintain their distributed energy resource aggregations (and distributed energy resources comprising their aggregations) consistent with requirements of the local regulatory authority, if any.</p>	This revision recognizes that tariffs of distribution operators and rules of local regulatory authorities also apply to the interconnection and operation of distributed energy resources and aggregations of those resources. Although these rules will apply of their own force and effect, this revision ensures a distributed energy resource provider must comply with those requirements as a condition of participating in the CAISO's market.
4.17.2(c)	Require distributed energy resource providers to comply with applicable	This revision seeks to ensure that distributed energy resource providers operate their market resources consistent with applicable reliability criteria. The

Tariff Section	Proposed Change	Justification
	reliability criteria to the extent they apply.	CAISO tariff defines applicable reliability criteria to mean “The Reliability Standards and reliability criteria established by NERC and WECC and Local Reliability Criteria, as amended from time to time, including any requirements of the NRC.” <i>See</i> Appendix A to the CAISO tariff, Master Definition Supplement.) The CAISO imposes the same requirement on other market participants. ( <i>See, e.g.</i> , CAISO tariff section 4.6.5.1.)
4.17.2(d)	Require distributed energy resource providers to operate and maintain their distributed energy resource aggregations consistent with applicable operating procedures and business practice manuals established by the CAISO.	This revision seeks to ensure that distributed energy resource providers operate their market resources consistent with applicable operating procedures and business practice manuals. The CAISO imposes the same requirement on other market participants. ( <i>See, e.g.</i> , CAISO tariff section 4.6.1.2.)
4.17.2(e)	Require distributed energy resource providers to operate and maintain their distributed energy resource aggregations in a manner consistent with limitations established by or operating orders of the utility distribution company or metered subsystem.	This revision recognizes that constraints on the distribution system apply to the operation of distributed energy resources. This revision ensures a distributed energy resource provider must comply with limitations or operating orders established by the operator of the relevant distribution system as a condition of participating in the CAISO’s market. The CAISO tariff recognizes similar requirements for participating generators interconnected to a distribution system. ( <i>See</i> CAISO tariff section 4.6.3.1 requiring that for any generating unit directly connected to a distribution system, “a Participating Generator shall comply with applicable UDC tariffs, requirements of the Local Regulatory Authority, interconnection requirements and generation agreements.”)

<b>Tariff Section</b>	<b>Proposed Change</b>	<b>Justification</b>
4.17.2(f)	Require the CAISO to coordinate with the applicable distribution system operators to avoid conflicting operational directives.	<p>This revision will help ensure the safe and reliable operation of distribution systems by requiring the CAISO to coordinate with operators of those systems with the aim of avoiding conflicting operational directives to distributed energy resource aggregations. The CAISO tariff recognizes similar requirements for participating generators interconnected to a distribution system. (See CAISO tariff section 4.6.3.1 requiring that for any generating unit directly connected to a distribution system, The CAISO and the UDC or MSS, as applicable, will coordinate to develop procedures to avoid conflicting CAISO and UDC or MSS, as applicable, operational directives.)</p> <p>The revision allows the CAISO to share with operators or the relevant distribution system information including, but not limited to, dispatch instructions for distributed energy resource aggregations. Sharing this information may be necessary and appropriate in some cases to ensure appropriate coordination between the CAISO and distribution operator occurs.</p>
4.17.3(a)	Establish a market rule that a distributed energy resource aggregation will consist of one (1) or more distributed energy resources.	This revision clarifies that the framework for wholesale market participation established through the CAISO's proposal is available to either one or more distributed energy resources.
4.17.3(b)	Establish a market rule that a distributed energy resource may not participate in more than one distributed energy resource aggregation	This revision helps ensure the CAISO models distributed energy resource aggregations correctly and does not double count or double pay for distributed energy resources participating in aggregations.

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4.17.3(c)	Establish a market rule that a distributed energy resource may not participate as a resource in the CAISO Market separate from the distributed energy resource aggregation.	This revision helps ensure the CAISO models distributed energy resource aggregations correctly and does not double count or double pay for distributed energy resources participating in aggregation.
4.17.3(d)	Establish a market rule that a distributed energy resource participating in a distributed energy resource aggregation may not also participate in a retail net energy metering program that does not expressly permit wholesale market participation.	This revision ensures that net energy metering resources that already receive compensation through a credit paid against utility retail rates for banking and withdrawing energy in a later interval do not also receive wholesale market revenues for this energy.
4.17.3(e)	Require that each distributed energy resource aggregation must be located in a single Sub-LAP.	This revision helps to ensure that distributed energy resource aggregations do not span multiple transmission constraints such that operation of distributed energy resources in those aggregations may counteract each other's impact on congestion management. This revision helps avoid the potential that in responding to a CAISO dispatch instruction, a distributed energy resource aggregation does not exacerbate a constraint between Sub-LAPs.
4.17.3(f)	Require distributed energy resource aggregation to provide a net response at its price node(s) within its Sub-LAP that is consistent with CAISO dispatch instructions and applicable	This revision recognizes that distributed energy resources that comprise an aggregation may be located behind different pricing nodes, but requires that the aggregated resource respond to CAISO dispatch instructions based on the distribution factors contemplated by the CAISO market systems. The rule helps ensure that the market resource provides the anticipated benefits to the operation of

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	generation distribution factors.	the CAISO grid based on its bid-in or established generation distribution factors.
4.17.3(g)	Establish a market rule that distributed energy resource aggregations are scheduling coordinator metered entities.	Similar to demand response resources, the CAISO is proposing that distributed energy resource aggregations will be scheduling coordinator metered entities. Scheduling coordinators will need to enter into a meter service agreement for scheduling coordinators with the CAISO. This approach reduces the burden on smaller distribution-connected resources to invest in infrastructure necessary to have their meters polled directly by the CAISO. These revisions, however, still ensure that the CAISO receives settlement quality meter data and can issue settlement statements that reflect the aggregation's response to CAISO dispatch instructions.
4.17.4	Require distributed energy resource providers to make accurate information about its aggregation available to the CAISO and establish a process for the CAISO to confer with utility distribution companies or metered subsystems regarding this information as well as concerns, including safe and reliable operation of the distribution system.	These revisions ensure the CAISO will have accurate information about the location and make up of distributed energy resource aggregations. The revisions mitigate the risk that the CAISO could double count a resource or model it both as part of an aggregation as well as a separate CAISO market resource. The revisions also ensure that utility distribution companies or metered subsystems have the opportunity to raise concerns with whether the distributed energy resource proposing to join an aggregation complies with applicable utility tariffs and applicable requirements of the local regulatory authority. In addition, the revisions also ensure that utility distribution companies or metered subsystems have the opportunity to raise concerns that the operation of distributed energy resources that comprise an aggregation may pose a threat to the safe and reliable operation of their distribution systems. These entities are in the best position to assess that issue and identify any mitigation measures

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		necessary to ensure the aggregation can operate in response to CAISO dispatch instructions without creating that threat.
4.17.5.1	Establish minimum size limit for distributed energy resource aggregations and a maximum size limit for aggregations spanning multiple pricing nodes.	In the case of the minimum size limit, these revisions help ensure that an aggregation has a measurable impact on the transmission system. In the case of the maximum size for aggregations that span different pricing nodes, these revisions ensure the CAISO has an opportunity to assess how these aggregations will impact congestion on the CAISO grid before they are allowed to grow to larger sizes.
4.17.5.2	Establish foundational metering rules for distributed energy resource aggregations, including requirements to submit actual metering data for every interval of an operating day, to directly meter distributed energy resource comprising an aggregation, and to provide meter data to the CAISO upon request. Establish that distributed energy resource aggregations must meet the same telemetry requirements as other resources based on size and whether they offer ancillary services.	These revisions ensure the CAISO can obtain settlement quality meter data reflecting actual production or consumption of energy by distributed energy resource comprising an aggregation. The meter data will permit the CAISO to calculate settlement statements for the aggregation based on dispatch instructions. In addition, the revisions ensure that distributed energy resource aggregations have the same telemetry requirements as other market resources.
4.17.6	Establish rule to allow the CAISO to dispatch distributed energy resource aggregations based on an aggregation's bids and	These revisions establish the requirement for distributed energy resource aggregations as CAISO market resources to respond to CAISO dispatch instructions consistent with applicable generation distribution factors. The revisions also

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	<p>awards, as well as exceptionally dispatch the aggregation.</p> <p>Establish requirement that distributed energy resource providers operate aggregations in a manner consistent with limitations or operating orders established by the utility distribution company or metered subsystem, as well as requirement that scheduling coordinators submit outages to reflect distribution constraints.</p>	<p>ensure that the aggregation is operated in a manner that protects the safe and reliable operation of the applicable distribution system. For example, when disaggregating CAISO dispatch instructions to distributed energy resources, the distribution energy resource provider will need to respect limitations on the distribution system.</p>
6.3	<p>Identify that the CAISO will communicate dispatch instructions to the scheduling coordinator for distributed energy resource providers.</p>	<p>This revision identifies distributed energy resource providers on a list of other market participants for whom scheduling coordinators may receive CAISO dispatch instructions. All market participants must use a scheduling coordinator to participate in the CAISO's markets.</p>
6.3.1	<p>Identify distributed energy resource providers as a market participant subject to existing scheduling coordinator communication protocols.</p>	<p>This revision identifies distributed energy resource providers on a list of other market participants for which existing scheduling coordinator communication protocols apply. This revision treats distributed energy resources similar to all other market participants with respect to these protocols.</p>
10.3.2.1	<p>Add clarifying language that settlement quality meter data shall be an accurate measure of energy produced or</p>	<p>This revision clarifies that in addition to scheduling coordinators' duty to provide settlement quality meter data for scheduling coordinator metered entities, the data must be accurate.</p>

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	consumed in each settlement period.	
10.3.2.1.1	Make clarifying changes to tariff provision for scheduling coordinators representing demand response providers.	These revisions reflect existing rules. Scheduling coordinators representing demand response providers must submit meter data that reflects (1) an accurate measure of the actual consumption of energy by each scheduling coordinator metered entity in each settlement period in which the CAISO dispatches the resource; or (2) statistically derived meter data, in cases where interval metering is not available.
10.3.2.1.2	<p>Add language requiring scheduling coordinators representing distributed energy resource providers to aggregate metered data of individual distributed energy resources in an aggregation. Require that the meter data submitted must be accurate measure of the actual production or consumption of energy by each distributed energy resource that comprises the aggregation in each settlement period.</p> <p>Require that scheduling coordinators retain settlement quality meter data for at least 3 years and provide this information to the CAISO as it may reasonably request from time to time.</p>	<p>These revisions ensure that the CAISO receives settlement quality meter data at the resource level. Scheduling coordinators representing distributed energy resource providers have the obligation to ensure the provider has accurately aggregated data reflecting actual energy production or consumption before submitting that data to the CAISO for settlement purposes in all settlement periods. The CAISO is requiring these scheduling coordinators provide settlement quality meter data for every operating interval of the day, <i>i.e.</i>, 24 hours per day, 7 days per week.</p> <p>The CAISO proposed data retention requirement will ensure that the CAISO can obtain information about individual distributed energy resources' participation in an aggregation to validate whether the aggregation responded to CAISO dispatch instructions consistent with its generation distribution factors. The CAISO has committed to sample this information and provide summary reports of its findings to all market participants.</p>

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10.3.9	Add clarifying language concerning certification of meters for which no Local Regulatory Authority criteria have been prescribed that allows scheduling coordinators to self-certify that their revenue meters meet the default certification criteria set forth in the CAISO business practice manual.	These revisions clarify that scheduling coordinators do not need to have authorized CAISO metering inspector certify that meters meet the CAISO default certification criteria. Instead, these scheduling coordinators can self-certify that their revenue meters meet those criteria. Given that aggregation may be composed of multiple distributed energy resources, the CAISO believes requiring a CAISO authorized inspector to certify each meter could create an undue burden on a distributed energy resource provider. A self-certification requirement strikes an appropriate balance between creating an undue burden and requiring validation that metering facilities meet the CAISO's default requirements.
10.3.11	Add clarifying language concerning certification of metering facilities for which no Local Regulatory Authority criteria have been prescribed that allows scheduling coordinators to self-certify that their metering facilities meet the default certification criteria set forth in the CAISO business practice manual	These revisions clarify that scheduling coordinators do not need to have authorized CAISO metering inspector certify that metering facilities meet the CAISO default certification criteria. Instead, these scheduling coordinators can self-certify that their metering facilities meet those criteria. Given that aggregation may be composed of multiple distributed energy resources, the CAISO believes requiring a CAISO authorized inspector to certify each meter could create an undue burden on a distributed energy resource provider. A self-certification requirement strikes an appropriate balance between creating an undue burden and requiring validation that metering facilities meet the CAISO's default requirements.
16.5.1	Add distributed energy resource providers to the list of market participants that must comply with CAISO dispatch instructions and operating orders	This revision identifies distributed energy resource providers on a list of other market participants that must adhere to an existing tariff provision to comply fully and promptly with CAISO dispatch instructions and operating orders, unless such operation would impair public health or safety. The

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	during system emergencies unless doing so would threaten the public health and safety.	proposed revision is to a tariff section addressing how the CAISO will administer existing contracts. This requirement supports the reliable operation of the transmission system.
17.2.1	Add distributed energy resource providers to the list of market participants that must comply with CAISO dispatch instructions and operating orders during system emergencies unless doing so would threaten the public health and safety.	This revision identifies distributed energy resource providers on a list of other market participants that must adhere to an existing tariff provision comply fully and promptly with CAISO dispatch instructions and operating orders, unless such operation would impair public health or safety. The proposed revision is to a tariff section addressing how the ISO will administer transmission ownership rights. This requirement supports the reliable operation of the transmission system.
30.5.2.6	Add tariff section specifying supply bid components for distributed energy resource aggregations, including generation distribution factors, ramp rate, minimum and maximum operating limits; energy limit, and contingency flag. Clarifies that the CAISO will use generation distribution factors registered in its Master File if the scheduling coordinator does not submit them with a bid.	These revisions establish additional supply bid components for distributed energy resource aggregations. In addition to other common elements of supply bids, these bid components will permit the CAISO's market systems to clear bids associated with distributed energy resource aggregations and dispatch these resources consistent with those bids. If the scheduling coordinator does not bid-in generation distribution factors to reflect the dynamic operation of the aggregation, the CAISO's market processes need to model the distribution of the aggregation. The generation distribution factor registered in the Master File is the best alternative
30.5.2.7	Renumbered existing tariff section 30.5.2.6.	
30.5.2.8	Renumbered existing tariff section 30.5.2.7.	

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37.8.4	Add distributed energy resource providers to the list of market participants that the CAISO will notify if the CAISO is investigating a potential violation by the distributed energy resource provider of the CAISO's rules of conduct.	This revision identifies distributed energy resource providers on a list of other market participants that the CAISO will notify if it is undertaking an investigation of whether the distributed energy resource provider violated the CAISO's rules of conduct. The revision treats distributed energy resource providers similar to other market participants.
Appendix A Distributed Energy Resource	Add a definition for distributed energy resource to mean "any resource with a first point of interconnection to a Utility Distribution Company or a Metered Subsystem."	This definition recognizes multiple types of resources within the CAISO's balancing authority area that are interconnected to the distribution system either in front of or behind the customer meter. Using a broad definition will avoid the possibility of inadvertently excluding resource types from participating in an aggregation.
Appendix A Distributed Energy Resource Aggregation	Add a definition for distribution energy resource aggregation to mean: "A resource comprised of one or more Distributed Energy Resources."	This definition clarifies that the aggregation is the resource for purposes of CAISO market participation and permits the resource to include one or more distributed energy resources.
Appendix A Distributed Energy Resource Provider	Add a definition for distributed energy resource provider to mean: "The owner/operator of one or more Distributed Energy Resource Aggregations that participates in the CAISO markets as such."	This definition clarifies that the distributed energy resource providers, as the owner/operator of the distributed energy resource aggregation is the market participant. The CAISO's existing tariff includes similar definitions for other market participants.
Appendix A Generation	Clarify that the existing definition of generation	This revision extends the definition of generation distribution factor to distributed

<b>Tariff Section</b>	<b>Proposed Change</b>	<b>Justification</b>
Distribution Factor (GDF)	distribution factor will also apply to distributed energy resource aggregations.	energy resource aggregations because it is a bid component that these resources will use. The current definition applies only to physical scheduling plants and system resources.
Appendix A Scheduling Coordinator Metered Entity	Clarify that the existing definition of scheduling coordinator metered entity includes distributed energy resource aggregation.	This revision includes distributed energy resource aggregation on the list of resources that are scheduling coordinator metered entities.
Appendix B.21 Article I	This article contains provisions related to definitions and interpretation of the distributed energy resource provider agreement.	This article reflects standard provisions that the CAISO includes in other <i>pro forma</i> agreements that market participants execute as a condition of participation in the CAISO's market. ( <i>See, e.g.</i> , Appendix B.2 to the CAISO tariff, Participating Generator Agreement, Article I.)
Appendix B.21 Article II	This article reflects acknowledgments that each party to the agreement makes.	This article describes the general responsibilities of each party in terms of their relationship and identifies that execution of the agreement is a necessary pre-condition to participating in the CAISO's market through a scheduling coordinator.
Appendix B.21 Article III	This article describes the term of the agreement as well as termination rights.	This article makes the agreement effective when both parties have executed the agreement and states it will continue in effect until termination under the provisions of this article either by CAISO or the distributed energy provider. The termination provisions mirror those in other CAISO market participant pro forma agreements. ( <i>See, e.g.</i> , Appendix B.2 to the CAISO tariff, Participating Generator Agreement, Article III.)
Appendix B.21 Article IV	This article includes general terms and conditions associated with a distributed	Similar to other market participant agreements, this article articulates responsibilities of Distributed Energy Resource providers and incorporates by

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	energy resource provider's operation of a distributed energy resource aggregation in the CAISO's markets.	reference applicable terms of the CAISO tariff. By doing so, the CAISO can ensure the distributed energy resources has agreed to abide by those terms and conditions of service.
Appendix B.21 Article V	This article establishes the right for the CAISO to impose penalties and sanctions against the distributed energy resource provider subject to the Commission's prior approval. The article also authorizes the CAISO to take corrective measures against the distributed energy resource provider if authorized by the CAISO tariff.	This article ensures a framework exists for the CAISO to impose penalties and sanctions against the distributed energy resource provider, if the Commission so authorizes. The provisions mirror those in other CAISO market participant pro forma agreements. ( <i>See, e.g.,</i> Appendix B.2 to the CAISO tariff, Participating Generator Agreement, Article V.)
Appendix B.21 Article VI	This article clarifies that the distributed energy resource provider bears responsibility for the costs of operating and maintaining its distributed energy resource aggregation.	This article ensures that a distributed energy resource provider may not assert a claim for cost recovery against the CAISO or market participants for the costs of meeting its obligations under this agreement.
Appendix B.21 Article VII	This article incorporates dispute resolution provisions for any disputes arising from the agreement.	This article reflects standard dispute resolution language and ensures the CAISO does not unduly discriminate against distributed energy resource providers by applying the same dispute resolution processes it applies to all other market participants. ( <i>See, e.g.,</i> Appendix B.2 to the CAISO tariff, Participating Generator Agreement, Article VII.)

<b>Tariff Section</b>	<b>Proposed Change</b>	<b>Justification</b>
Appendix B.21 Article VIII	This article includes representations and warranties.	This article reflects standard contractual language that each party represents it has necessary authorizations to execute the agreement and provides the CAISO assurances that the distributed energy resource provider has obtained the necessary approvals to operate distributed energy resources comprising its aggregation(s).
Appendix B.21 Article IX	This article incorporates by reference the provisions of section 14 of the CAISO tariff related to liability into the distributed energy resource provider agreement.	This article ensures the CAISO does not unduly discriminate against distributed energy resource providers by applying the same liability provisions that it applies to all other market participants. ( <i>See, e.g.</i> , Appendix B.2 to the CAISO tariff, Participating Generator Agreement, Article IX.)
Appendix B.21 Article X	This article incorporates by reference the provisions of section 14 of the CAISO tariff related to liability of the CAISO and uncontrollable forces into the distributed energy resource provider agreement.	This article ensures the CAISO does not unduly discriminate against distributed energy resource providers by applying the same liability and uncontrollable forces provisions that it applies to all other market participants. ( <i>See, e.g.</i> , Appendix B.2 to the CAISO tariff, Participating Generator Agreement, Article X.)
Appendix B.21 Article XI	This article contains miscellaneous terms and conditions that apply to the agreement, including, among others, assignment of the agreement, notices, waiver, governing law, and severability.	This article ensures the CAISO does not unduly discriminate against distributed energy resource providers by applying the same standard contract provisions that it applies to all other market participants. ( <i>See, e.g.</i> , Appendix B.2 to the CAISO tariff, Participating Generator Agreement, Article XI.)