

energy storage and distributed energy resources (“ESDER”). The CAISO’s ESDER initiative has resulted in three sets of tariff enhancements with the Commission, and is currently in its fourth phase of development.² Additionally, in 2016 the Commission approved the CAISO’s first-of-its-kind process, allowing small DERs that are unable to meet minimum capacity requirements individually to aggregate and participate jointly in the CAISO markets.³

Moreover, each CAISO transmission owner that is FERC jurisdictional and operates distribution facilities has a wholesale distribution access tariff (“WDAT”) with the express purpose of enabling DERs to interconnect to the distribution grid and still participate in the CAISO wholesale markets. These transmission owners actively participate in CAISO stakeholder processes and update their WDATs to remain consistent with the CAISO tariff.

General

1. Under your RTO's/ISO's existing rules for small generator interconnection, if a DER seeks to participate in wholesale markets and plans to interconnect at the distribution level, please describe the step-by-step process by which that resource would interconnect to the system.

a. What are the respective roles of the RTO/ISO and the distribution utility in that process?

Section 25.2 of the CAISO tariff provides:

Any proposed interconnection by the owner of a planned Generating Unit, or its designee, to connect that Generating Unit to a Distribution System of a Participating TO will be processed, as applicable, pursuant to the Wholesale Distribution Access Tariff or CPUC Rule 21, or other Local Regulatory Authority requirements, if applicable, of the Participating TO;

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http://www.caiso.com/informed/Pages/StakeholderProcesses/EnergyStorage_DistributedEnergyResources.aspx.

³ *California Independent System Operator Corp.*, 155 FERC ¶ 61,229 (2016).

provided, however, that the owner of the planned Generating Unit, or its designee, shall be required to mitigate any adverse impact on reliability of the CAISO Controlled Grid consistent with Appendix DD. In addition, each Participating TO will provide to the CAISO a copy of the system impact study used to determine the impact of a planned Generating Unit on the Distribution System and the CAISO Controlled Grid pursuant to a request to interconnect under the applicable Wholesale Distribution Access Tariff or CPUC Rule 21, or other Local Regulatory Authority requirements, if applicable.

As such, a DER planning to participate in the CAISO markets generally would submit an interconnection request to its utility distribution company (“UDC”) pursuant to the applicable UDC tariff and process. In the vast majority of cases, the applicable process is set forth in the UDC’s WDAT. The UDC performs all of the interconnection studies and administers the interconnection process, including the construction of network upgrades to mitigate any impact on the distribution or transmission grids. If the DER seeks a deliverability capacity allocation to be eligible to provide Resource Adequacy capacity, the CAISO performs the deliverability studies and informs the UDC of the results.⁴

Before the DER achieves commercial operation, it goes through the CAISO’s new resource implementation (“NRI”) process⁵ to model the DER in the CAISO’s full network model, register its scheduling coordinator, and execute a participating generator agreement⁶ with the CAISO.

⁴ See Section 40.4.6 of the CAISO tariff regarding the distributed generation deliverability assessment.

⁵ <http://www.caiso.com/participate/Pages/NewResourceImplementation/Default.aspx>.

⁶ Appendix B.2 to the CAISO tariff.

b. How would the DER ascertain whether it must interconnect pursuant to a state-jurisdictional interconnection process or a Commission-jurisdictional process?

DERs work with their UDCs to ensure they interconnect pursuant to the correct process. The CAISO has observed that generation developers in the development process of a new DER have already made a decision to sell energy through a net energy metering (“NEM”) program or through the CAISO markets. The former interconnect pursuant to a state-jurisdictional process, and the latter inform their UDC that they ultimately intend to participate in the CAISO markets, and thus interconnect pursuant to a FERC-jurisdictional process.

c. How does your RTO/ISO define the physical boundaries of a distribution facility when determining whether a distribution facility to which a new DER seeks interconnection is already subject to an Open Access Transmission Tariff (OATT) for purposes of making wholesale sales?'

As described in response to question 1(a), new DERs interconnect pursuant to the applicable UDC tariff and study procedures, and then provide evidence that they have been studied appropriately such that they can participate in the CAISO markets.

2. Does the interconnection process described in response to Question # 1 differ based on whether or not the DER is a Qualifying Facility, and if so, how?

The process does not change for the CAISO if the DER is a QF. QFs—especially cogeneration facilities—may execute Net Scheduled Participating Generator Agreements⁷ in lieu of a Participating Generator Agreements if they intend to participate as Net Scheduled Generating Units.⁸

⁷ Appendix B.3 to the CAISO tariff.

⁸ Section 4.6.3.3 *et seq.* of the CAISO tariff.

The CAISO also notes that older QFs⁹ whose original interconnection agreements and power purchase agreements expire may convert to CAISO participating generators without going through the interconnection study process once they have executed a generator interconnection agreement (“GIA”) with the CAISO, and gone through the CAISO’s NRI process.¹⁰ Several QFs convert to CAISO participating generator status every year through this process.

3. Does the interconnection process described in response to Question # 1 differ if the DER seeking to participate in wholesale markets is interconnecting behind a retail customer meter (whether on the distribution or transmission system), and if so, how?

Regarding the parenthetical, the point of interconnection (“POI”) determines whether the interconnection customer is transmission-connected or distribution-connected. An interconnection customer would not be a DER by virtue of interconnecting behind a retail customer meter if that customer were interconnected directly to the transmission grid. In other words, all DERs have points of interconnection on the distribution grid.

The process does not change for the CAISO if a DER interconnects behind a retail customer meter; however, the DER may require a sub-meter to ensure that its meter data do not include its onsite retail load.¹¹ The UDCs’ applicable tariffs also may have specific rules for DERs interconnecting behind retail customer meters.

⁹ These QFs predate the CAISO and have interconnection agreements with their utilities.

¹⁰ Section 25.1(e); 25.1.2, and 25.1.2.1 of the CAISO tariff.

¹¹ Unless the DER is participating as a Net Scheduling Generating Unit. See Section 4.6.3.3 *et seq.* of the CAISO tariff.

4. Does the interconnection process described in response to Question # 1 allow studies for bi-directional service (i.e., both from a DER to the transmission system and from the transmission system to a distribution-connected wholesale customer)?

As described in response to question 1(a), the UDCs study new DER interconnections. The CAISO defers to these entities to explain their interconnection study processes.

5. Under the interconnection process described in response to Question # 1, and assuming all of the individual DERs in the aggregation are new resources, which of the following would apply: (1) an aggregation of DERs located at multiple points of interconnection would be studied as one aggregated resource by your RTO/ISO and require only a single Generator Interconnection Agreement (GIA); (2) each individual DER would be studied individually and require its own GIA; (3) each DER would be studied individually with the aggregation still only requiring a single GIA; or (4) a different approach (please describe if a different approach would be used).

The CAISO allows DERs that cannot meet the CAISO's minimum capacity requirements—100 kW for storage resources and 500 kW for conventional generators—to aggregate with other DERs as a distributed energy resources aggregation (“DERA”) to be able to sell energy and ancillary services in the CAISO markets as a Distributed Energy Resource Provider (“DERP”).¹² The Commission approved DERAs in 2016.¹³ Individual DERs 1 MW or greater may not participate in DERAs and must participate as stand-alone participating generators.¹⁴ The DERs within a DERA must be located in a single Sub-LAP, and the DERA cannot exceed 20 MW.¹⁵

¹² Section 4.17 of the CAISO tariff.

¹³ *California Independent System Operator Corp.*, 155 FERC ¶ 61,229 (2016) (“DERA Order”).

¹⁴ DERA Order at P 5; Section

¹⁵ Section 4.17 of the CAISO tariff. A Sub-LAP is a defined subset of pricing nodes within a default load aggregation point (default LAP). Sub-LAPs were initially developed with the advent of congestion revenue rights to reflect major transmission constraints within each utility service territory. The Sub-LAP rule for DERPs ensures that they do not create additional congestion. DERA Order at P 10.

Before forming a DERA, the individual DERs interconnect and execute the applicable interconnection agreements individually. Pursuant to the DERA Order, the CAISO does not require that the individual DERs forming a DERA interconnect pursuant to a WDAT.¹⁶ Once interconnected, the DERs would execute a Distributed Energy Resource Provider Agreement (“DERPA”). The applicable UDC would also assess any impact their aggregated participation may have on the distribution system. As described in the CAISO tariff¹⁷ and the DERA Order, the CAISO confers with the applicable UDC about the DERs comprising a DERA. Once notified of the potential DERA, UDCs have 30 days to provide written comments regarding the accuracy of the information about DERs comprising a DERA or raise concerns with respect to whether the DERs (1) are participating in another DERA; (2) are participating as a demand response resource; (3) are participating in a retail NEM program that does not expressly permit wholesale market participation; (4) do not comply with applicable UDC 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 DERA.¹⁸

DERPs must resolve UDC concerns before they may participate in the CAISO markets. Any disputes must be resolved by the applicable authority (not the CAISO).¹⁹

¹⁶ DERA Order at PP 46-64.

¹⁷ Section 4.17.4 of the CAISO tariff

¹⁸ *Id.*

¹⁹ *Id.*

The CAISO has a detailed website²⁰ and DERP Participation Guide and Checklist²¹ that explains these processes in detail.

6. In contrast with the scenario in Question # 5, please assume that at least some of the individual DERs in a proposed aggregation are existing resources already interconnected and in service. If multiple existing and new DERs were able to aggregate at separate points of interconnection across your RTO/ISO to participate in wholesale markets as an aggregation rather than as individual resources, under what circumstances would your RTO's/ISO's existing interconnection procedures and study processes apply to the individual DERs in the aggregation?

If multiple existing and new DERs were able to aggregate at separate points of interconnection across your RTO/ISO to participate in wholesale markets as an aggregation rather than as individual resources, under what circumstances would your RTO's/ISO's existing interconnection procedures and study processes apply to the aggregation? Would any revisions be needed to accommodate aggregations of DERs (existing and new) at multiple points of interconnection?

a. Under existing tariff rules, which entity (i.e., the RTO/ISO or the distribution utility) would be responsible for processing the interconnection of the individual DERs seeking to join an aggregation?

The process is the same. DERs, participating individually or through an aggregation, interconnect to the distribution system under the applicable tariff of the UDC. Please see the CAISO's response to Question 5.

²⁰ <http://www.caiso.com/participate/Pages/DistributedEnergyResourceProvider/Default.aspx>

²¹ <http://www.caiso.com/Documents/DistributedEnergyResourceProviderParticipationGuideandChecklist.pdf>.

b. For existing DERs that are currently not participating in wholesale markets and that interconnected under a state-jurisdictional process, under your current interconnection procedures would the DER's decision to participate in an aggregation trigger the RTO/ISO interconnection process? Would additional studies be necessary to ensure that participation in your RTO's/ISO's wholesale markets through an aggregation does not cause reliability problems on the transmission system? If so, what studies? If not, why not? For example, would the original state-jurisdictional interconnection process have already studied the DER in a variety of operational scenarios that eliminate the need for further studies prior to wholesale market participation in your region?

Deciding to participate in the CAISO markets after interconnection pursuant to a state-jurisdictional process generally does not require the DER to submit an interconnection request to the CAISO pursuant to its tariff. Section 25.2 of the CAISO tariff expressly allows DERs to participate in the CAISO markets even if they have been studied through a state-jurisdictional process. Likewise, the DERA Order examined and rejected the suggestion that DERs must be studied pursuant to WDATs before they may participate in a DERA.²²

Stand-alone DERs only need to produce a copy of their system impact study to demonstrate that they do not cause or have mitigated any potential reliability impact on the CAISO controlled grid.²³ Any issue with DERAs would be examined through the UDC coordination process described in response to Question 5.²⁴

²² DERA Order at PP 46-64.

²³ Section 25.2 of the CAISO tariff.

²⁴ See Section 4.17.4 of the CAISO tariff.

c. If existing distribution-level DERs that are currently not participating in wholesale markets join aggregations and start making wholesale sales for the first time, how would that new wholesale use of existing DERs and their associated distribution facilities impact your assessment of whether those distribution facilities are subject to your OATT? Would Commission-jurisdictional interconnection procedures apply to subsequent requests to interconnect to those distribution facilities? Why or why not?

Please see the CAISO's response to Question 5.

d. For large and small generator interconnections subject to Order Nos. 2003 and 2006, the transmission provider is required to coordinate between the interconnection customer and "affected systems" (i.e., third-party transmission systems) to ensure that any needed affected system issues are resolved. With respect to new DERs seeking to interconnect to distribution facilities that are subject to a Commission-jurisdictional OATT, do the relevant small generator interconnection procedures in your region treat the transmission system to which the relevant distribution facilities are connected as an "affected system" in order to address any needed transmission upgrades at the initial interconnection stage?

The California Public Utilities Commission's Rule 21 establishes the *pro forma* interconnection rules and procedures for state-jurisdictional utilities.²⁵ The Rule 21 tariffs and the WDATs require DERs to mitigate any potential reliability impact on the CAISO controlled grid.²⁶ Although both types of tariffs essentially require the UDCs to treat the CAISO as an affected system, the CAISO does not study DER interconnections even if the UDC believes that the DER will impact the CAISO controlled grid. Because the UDC also is the impacted participating transmission owner ("PTO"), the UDC/PTO also performs the reliability studies and assigns any required

²⁵ California Public Utilities Commission, "Rule 21," <https://www.cpuc.ca.gov/Rule21/>.

²⁶ See, e.g., Section E.4.f of PG&E Rule 21 tariff, available at https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_RULES_21.pdf.

reliability network upgrades on the CAISO controlled grid for the DER.²⁷ The CAISO is informed of the results.

7. If the individual DERs in an aggregation are seeking to interconnect to a combination of distribution facilities, some of which are subject to a Commission-jurisdictional OATT and some that are not subject to an OATT, would any, all, or only a subset of the DERs in the aggregation be required to go through the interconnection process you described in response to Question #1 and to execute GIA(s) under your tariff? Please explain.

As explained above, the CAISO's processes and rules do not change based on whether the DERs originally interconnected pursuant to a state- or FERC-jurisdictional tariff.

8. If available, please provide data on or estimates of the number of individual DERs in your region that are directly participating today in your RTO/ISO markets as compared to DERs in your region that are not participating in wholesale markets. If possible, please provide estimates by resource type and participation model (i.e., generator, demand response, etc.).

The CAISO does not have specific data on the number or capacity of DERs participating or not participating in the CAISO markets. DERs execute the same Participating Generator Agreement that transmission-connected resources execute, and the CAISO's Master File and network models consider the voltage level of the point of interconnection; not whether that interconnection is considered transmission or distribution.²⁸ Determining whether each participating generator is interconnected to the transmission or distribution grid would require significant time and resources.

²⁷ This is slightly different than the affected system process where *only* the affected system has the relevant information to study the potential impact on its system, and therefore must perform its own studies completely separate from the interconnecting utility.

²⁸ Voltage is not a perfect indicator of being transmission or distribution. The CAISO operates many transmission lines well below 100 kV.

Additionally, the CAISO expects that the PTO/UDCs may track these data on this basis, and may comment on the extent to which they can provide them.

As the Commission is aware, there has been significant growth in behind-the-meter DERs in California. California tracks *non-participating* DER interconnections at <https://www.californiadgstats.ca.gov>. As an example, there is 7,448 MW of non-utility behind-the-meter rooftop solar PV installed in the PG&E, SCE, and SDG&E service territories.

9. Do you or the distribution utilities in your region have data on or estimates of how many distribution facilities, as defined in your answer to Question #1.c. above, are currently subject to an OATT compared to the total number of distribution facilities in the RTO/ISO footprint?

a. If yes, please provide this data or estimates.

The CAISO does not have these data.

b. How is this information managed and updated?

Not applicable.

10. Is your RTO/ISO engaged in any ongoing discussion or coordination with state or local authorities regarding the interconnection process for DERs? If so, please describe this discussion or coordination.

DERs' ability to participate in the CAISO markets has been a settled issue in California for many years. Recent regulatory coordination efforts have focused on modern, complex issues like DERAs, multiple-use applications,²⁹ and accounting for net energy metering resources.³⁰ In addition, the CAISO continues to pursue discussion

²⁹ See, e.g., "Decision on Multiple Use Applications," CPUC Docket No. R.15-03-11 (Jan. 17, 2018), available at <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M206/K462/206462341.pdf>

³⁰ See, e.g., CAISO, "Excess Behind the Meter Production – Draft Final Proposal," Dec. 12, 2018, available at <http://www.aiso.com/Documents/DraftFinalProposal-ExcessBehind-MeterProduction.pdf>.

with transmission owners, UDCs, and local regulatory authorities on managing the transmission–distribution interface with a high volumes of DERs.

11. If a DER needs to transmit its output over distribution facilities to make sales into the RTO/ISO markets, are there any existing tariff provisions that govern such service? If so, please list and describe such provisions and describe whether that service is bi-directional.

Each FERC-jurisdictional utility in California has a WDAT for the express purpose of enabling DERs to participate in the CAISO markets. The CAISO defers to the UDCs to inform the Commission whether service is bidirectional.

CAISO Specific

1. Under the CAISO DER Provider framework, is CAISO made aware of whether a DER within an aggregation has interconnected under California Rule 21 or a Wholesale Distribution Access Tariff (WDAT)?

a. If so, (1) how is CAISO made aware and (2) what percentage of DERs within aggregations are interconnected under a WDAT?

The CAISO would not be aware of whether a DER within a DERA has interconnected under Rule 21 of a WDAT. As explained in response to question 5, the CAISO examines DERAs as aggregated resources only, and the UDC has the opportunity to raise any concerns with the DERs' participating as a DERA.

b. Does CAISO anticipate complications with allowing aggregations of DERs interconnected under different distribution-level tariffs? If so, please explain.

The CAISO does not anticipate complications. The CAISO tariff requires the CAISO to work with the UDCs to ensure that no issues arise as a result of DERAs.

Please see the CAISO's response to Question 5.

2. Please explain how telemetry and data collection requirements for an aggregation comprised of DERs interconnected under California Rule 21 differ from those of individual DERs interconnected under a WDAT.

The CAISO does not distinguish among DERs within a DERA based on their interconnecting tariff. UDCs may, however, have different requirements for the individual DERs that make up the DERA.

3. Are there any restrictions on the participation of a DER located within the footprint of a utility not subject to the Commission's regulations under sections 205 and 206 of the Federal Power Act in the CAISO markets?

As described above, the CAISO does not preclude resources from participating in wholesale markets based on whether they are subject to a different tariff that is not FERC jurisdictional. Please see the CAISO's response to Question 6(b).

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each party listed on the official service list for this proceeding, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010 (2014)).

Dated at Folsom, California on this 7th day of October, 2019.

/s/ Martha Sedgley
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