

Hybrid Resources - Phase 1 Matrix of Tariff Changes

Tariff Section	Stakeholder Comment	CAISO Response
Appendix A – Definition of High Sustainable Limit; Section 4.8.2	PG&E: PG&E seeks clarity as to the purpose of including language unrelated to the Aggregate Capability Constraint – Why is High Sustainable Limit defined in this phase not included in phase 2 of the draft tariff language? Also, why is tariff language included regarding VER data requirements prior to the implementation of a non-co-located hybrid resource model?	The CAISO is working to develop a hybrid resource model in phase 2 of this initiative; however, hybrid resources will begin operating prior to implementation of this model. At present, the CAISO does not have enabling tariff language to support obtaining meteorological and outage information from the variable energy component of a hybrid resource. Scheduling Coordinators for such resources also have indicated they would like to continue to receive an informational forecast. For these reasons, the CAISO is proposing to include tariff language in Appendix A and section 4.6.2 as part of phase 1 of this initiative to establish a requirement for hybrid resources to provide this information subject to a forecast fee. The CAISO recognizes that the draft tariff language suggests this requirement would apply to co-located resources. The CAISO will modify the draft tariff language to clarify that the requirement applies to hybrid resources.
Section 4.8.2	SVP: Please clarify which resources the added language concerning proposed requirements for Scheduling Coordinators' data submission and forecasting are intended to apply, i.e., to generating units participating as a single resource or multiple resources? Though CAISO is not proposing a tariff definition for Hybrid Resources (as defined in the April 29 proposal) at this time,	The CAISO recognizes that the draft tariff language suggests this requirement would apply to co-located resources. The CAISO will modify the draft tariff language to clarify that the requirement applies to hybrid resources.

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	<p>there is confusion as to whether the proposed requirements in tariff § 4.8.2 are intended to apply to “Hybrid Resources” (single resource) or “Co-Located Resources” (different resources). This confusion is heightened by the fact that there is currently no definition of “co-located” Generating Unit in the CAISO tariff, which is the terminology CAISO uses in proposed § 4.8.2 (in addition to the other draft tariff provisions, as discussed below). It was SVP’s impression from the May 7 stakeholder meeting that CAISO’s proposal requiring Non-Generator Resources (“NGRs”) with Variable Energy Resource (“VER”) components to report forecast data (provided by CAISO or the resource owner) and High Sustainable Limits (submitted by the resource owner) to the CAISO, would apply to “hybrid resources” (i.e., single resource) before a tariff definition was proposed later in this initiative. This further appears to be the case based on the proposed tariff requirements’ application to “Generating Facilities that include a Generating Unit that would be a Variable Energy Resource absent co-located Generating Units”, which appears to align with the CAISO’s definition of “Hybrid Resources” proposed in the April 29 straw proposal stating such resources are ineligible to be VERs. However, SVP requests the CAISO either confirm or clarify SVP’s understanding if incorrect, and that the CAISO also clarify the requirements’ applicability in the tariff language itself, perhaps by proposing a definition of “Co-Located Resource” as done in the April 29 straw proposal.</p>	

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Appendix A Definition of Aggregate Capability Constraint	LSA/SEIA & EDF-R: Applicability of this proposal to EIM Entities/EIM Resources requires more discussion – not mentioned or discussed at the stakeholder meeting. (This comment also applies to other EIM edits below.)	In the real-time market, the CAISO can make the Aggregate Capability Constraint available to EIM Participating Resource Scheduling Coordinators to manage the PMax limitation of co-located EIM Participating Resources at their point of interconnection. The CAISO understands EIM participants support extension of this functionality to the EIM participating resources.
Appendix A Definition of Aggregate Capability Constraint	LSA/SEIA & EDF-R: Use of the “or” term here is confusing. -A Generating Facility usually only has one POI, so the second part of the sentence would be unnecessary. -ACC application to completely different Generating Facilities sharing a single POI, and/or treatment of the few Generating Facilities with multiple POIs, has not been discussed in the stakeholder process.	The CAISO will incorporate these suggestions into a revised definition of the Aggregate Capability Constraint. The CAISO is proposing only to apply the Aggregate Capability Constraint to Generating Units that comprise one Generating Facility behind a Point of Interconnection and not multiple Generating Facilities behind a Point of Interconnection.
Appendix A Definition of Co-located Resources	LSA/SEIA & EDF-R: Recommends including a defined term for co-located resource: Co-located Resources A Mixed-Fuel Project comprised of two or more Resource IDs, each with a single fuel type. Co-located Resources may be comprised of one or more Variable Energy Resources and resources that are not Variable Energy Resources.	The CAISO is considering this proposed definition and whether it encompasses all possible configurations of co-located resources. The CAISO is considering whether it is necessary to include this defined term in its tariff.

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	<p>Needs a formal definition. This definition is from the Revised Straw Proposal, with suggested edits from comments on the Second Revised Straw Proposal.</p>	
<p>Appendix A Definition of High Sustainable Limit</p>	<p>LSA/SEIA & EDF-R: As noted in 5/28 stakeholder comments, this element requires significantly more discussion before being included in a tariff filing. Moreover, since it applies only to Hybrid Resources (per Revised Straw Proposal – see below), we are confused about why it appears here. Suggest deferral to Phase II.</p> <p>Proposed redline:</p> <p>The instantaneous generating capability of a variable or intermittent Generating Unit or Hybrid Resource VER eComponent thereof, updated through telemetry at the Generating Unit every five minutes, <u>provided by Hybrid Resources bidding Ancillary Services into CAISO markets</u>. The High Sustainable Limit may not exceed the Generating Unit’s PMax.</p> <p>The HSL was only proposed to apply to a Hybrid Resource VER Component (or “Generating Unit”) and not to any separate Co-located VER “Generating Units.”</p>	<p>The CAISO is considering the proposed changes to the definition of High sustainable Limit. Although the CAISO is working to develop a hybrid resource model in phase 2 of this initiative, the CAISO anticipates that hybrid resources will begin operating prior to implementation of this model. At present, the CAISO does not have enabling tariff language to support obtaining meteorological and outage information from the variable energy component of a hybrid resource. For these reasons, the CAISO is proposing to include tariff language in Appendix A as part of phase 1 of this initiative to establish a requirement for hybrid resources to provide this information subject to a forecast fee. The CAISO recognizes that the draft tariff language suggests this requirement would apply to co-located resources. The CAISO will modify the draft tariff language to clarify that the requirement applies to hybrid resources.</p>

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<p>Appendix A Definition of Hybrid Resource</p>	<p>LSA/SEIA & EDF-R: Add definition of Hybrid Resource as recommended in May 28 stakeholder comments, and needed for HSL definition above.</p> <p>Hybrid Resource</p> <p>A Mixed-Fuel Project physically and electronically controlled by a single Interconnection Customer and Scheduling Coordinator (SC) behind a single Point of Interconnection (“POI”) that participates in CAISO markets as a single resource with a single market Resource ID. Hybrid Resources are not eligible to be Variable Energy Resources.</p>	<p>The CAISO is considering this suggested definition for Hybrid Resources. The CAISO will propose a defined term for Hybrid Resource in its next iteration of draft tariff language.</p>
<p>Appendix A Definition of Hybrid Resource Component</p>	<p>LSA/SEIA & EDF-R: Add definition of Hybrid Resource Component as recommended in May 28 stakeholder comments, and needed for HSL definition above.</p> <p>Hybrid Resource Component</p> <p>The portion of a Hybrid Resource consisting of capacity of a single fuel type, e.g., a VER-storage Hybrid Resource consists of a both a VER Component and a storage Component.</p>	<p>The CAISO is considering this suggested definition for Hybrid Resource Component. The CAISO is considering whether it is necessary to include this defined term in its tariff.</p>
<p>Appendix A Definition of Hybrid Resource VER Component Forecast</p>	<p>LSA/SEIA & EDF-R: Add definition of Hybrid Resource VER Component Forecast. This definition is needed if this is intended to be a comprehensive tariff amendment, including Hybrid Resource definitions, and for the Forecast Fee revisions.</p>	<p>The CAISO is considering this suggested definition for Hybrid Resource VER Component Forecast. The CAISO is considering whether it is necessary to include this defined term in its tariff.</p>

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	<p>Hybrid Resource VER Component Forecast</p> <p>Forecasted VER Component output capability at the POI (i.e., net of losses and auxiliary load).</p>	
<p>Appendix A Definition of Hybrid Resource Dynamic Limit Tool</p>	<p>LSA/SEIA & EDF-R: Add definition of Hybrid Resource Dynamic Limit Tool. This definition is needed if this is intended to be a comprehensive tariff amendment, including Hybrid Resource definitions.</p> <p>Hybrid Resource Dynamic Limit Tool</p> <p>The means by which the Hybrid Resource SC may provide an operational forecast of the overall capability of the Hybrid Resource, netting the operations of all Components, to the CAISO. This forecast should incorporate the following: Any VER Component Forecast, any storage Component State-of-Charge forecast, and the anticipated charging or discharging operation of any storage Component. This forecast will only be provided and utilized in CAISO Real-Time markets and is optional on the part of the Hybrid Resource SC.</p>	<p>The CAISO is considering this suggested definition for Hybrid Resource Dynamic Limit Tool. The CAISO is considering whether it is necessary to include this defined term in its tariff.</p>
<p>Appendix A Definition of Mixed Fuel Project</p>	<p>LSA/SEIA & EDF-R: Add definition of Mixed Fuel Project. This definition is if this is needed whether this tariff filing is intended to cover definitions for both Co-located and Hybrid Resources, or just the former.</p>	<p>The CAISO is considering this suggested definition for Hybrid Resource Dynamic Limit Tool. The CAISO is considering whether it is necessary to include this defined term in its tariff.</p>

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	<p>Mixed-Fuel Project</p> <p>A project located behind a single POI with more than one different fuel type, which could be configured as either a Hybrid Resource (single Resource ID) or Co-located Resources (multiple Resource IDs, each with a different fuel type).</p>	
<p>Appendix A Definition of Point of Interconnection</p>	<p>LSA/SEIA & EDF-R: See comments related to applicability of Aggregate Capability Constraint to EIM.</p>	<p>In the real-time market, the CAISO can make the Aggregate Capability Constraint available to EIM Participating Resource Scheduling Coordinators to manage the PMax limitation of co-located EIM Participating Resources at their point of interconnection. The CAISO understands EIM participants support extension of this functionality to the EIM participating resources.</p>
<p>27.13</p>	<p>LSA/SEIA & EDF-R: Use of the term “Generating Unit” instead of Generating Facility in the first sentence of section 27.13 requires more discussion. For example:</p> <ul style="list-style-type: none"> -The term “Generating Facility,” not “Generating Unit,” is used in the ACC definition above. -The term “Generating Facility” would seem to apply to all the Resource IDs under a single GIA, both Hybrid and Co-located. <p>The term “Generating Unit” would seem to apply to each of the Resource IDs in each Generating Facility. Thus, each Hybrid Resource, and each</p>	<p>The CAISO is proposing to use the Aggregate Capability constraint for Generating Units with different Resource IDs that are co-located at a Generating Facility with a single Point of Interconnection.</p>

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	Co-located Resource ID, would be a separate Generating Unit.	
27.13	<p>LSA/SEIA & EDF-R: In the second sentence, the term “co-located” (not as a defined term) is confusing, since (based on the definition) it could apply to:</p> <ul style="list-style-type: none"> -Generating Units associated with different Generating Facilities (which is not the intent); and/or -Hybrid Resources that are part of a Generating facility with other Hybrid Resources and Co-located Resources (defined term). 	The CAISO is proposing to use the Aggregate Capability Constraint for Generating Units with different Resource IDs that are co-located at a Generating Facility with a single Point of Interconnection. The CAISO agrees the proposed language is ambiguous and is considering changes to this draft tariff section to clarify this concept.
27.13	LSA/SEIA & EDF-R: In the third sentence, the use of the term “co-located” (non-capitalized) is confusing.	The CAISO is proposing to use the Aggregate Capability Constraint for Generating Units with different Resource IDs that are co-located at a Generating Facility with a single Point of Interconnection. The CAISO agrees the proposed language is ambiguous and is considering changes to this draft tariff section to clarify this concept.
27.13	LSA/SEIA & EDF-R: In the fifth sentence, modify the reference to Interconnection customer to refer to Generating Facility instead.	The CAISO is considering this proposed change. The CAISO will determine whether to apply the Aggregate Capability Constraint to Generating Units co-located at a Generating Facility with a single Point of Interconnection when an Interconnection Customer completes the CAISO’s new resource implementation process.

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27.13	<p>LSA/SEIA & EDF-R: In the sixth sentence, delete the word co-located.</p>	<p>The CAISO is considering this proposed change. The CAISO is proposing to use the Aggregate Capability Constraint for Generating Units with different Resource IDs that are co-located at a Generating Facility with a single Point of Interconnection.</p>
27.13	<p>LSA/SEIA & EDF-R: We understand the need for a “default” PMax allocation method. However, as noted above, the Master File problem does not apply to Hybrid Resources, only Co-located Resources, and there may be multiple Hybrid and Co-located Resources in the same Generating Facility. Thus, the IC needs a means of focusing the impact of this “punishment” on the offending Resource IDs and preserving the PMaxes of the other Resource IDs. Recommend adding the following sentence:</p> <p>However, the Interconnection Customer may request a re-allocation of those PMaxes as long as the total does not exceed the Interconnection Service Capacity of the Generating Facility.</p>	<p>LSA/SEIA & EDF-R are correct that this language only applies to co-located resources. The CAISO is considering this proposed change.</p>
27.13	<p>LSA/SEIA & EDF-R: Modify seventh sentence of section as follows:</p> <p>Scheduling Coordinators may not offer or self-provide Ancillary Services into the CAISO’s Markets from Generating Units that are subject to Aggregate Capability Constraints <u>before the CAISO provides notice that this restriction is removed.</u></p>	<p>The CAISO agrees that this approach is more efficient and is considering this proposed change.</p>

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	<p>This would allow removal of the restriction without another tariff filing. Also request that the CAISO commit in the cover note to FERC to implement this additional fix as soon as reasonably possible (e.g., before Fall 2021 if possible).</p>	
4.8.2	<p>LSA/SEIA & EDF-R: Modify third sentence of section 4.8.2 as follows:</p> <p><u>Scheduling Coordinators for Hybrid Resources with a Hybrid Resource VER Component</u> Generating Facilities that include a Generating Unit that would be a Variable Energy Resource absent co-located Generating Units must provide the CAISO <u>the same</u> meteorological and outage data for the variable Generating Unit Hybrid Resource VER Component, including the Generating Unit's High Sustainable Limit, and as specified in Appendix Q for <u>Eligible Intermittent Resources</u>.</p>	The CAISO is considering this proposed change.
4.8.2	<p>LSA/SEIA & EDF-R: Add the following sentence to section 4.8.2:</p> <p><u>Hybrid Resources with a Hybrid Resource VER Component must also provide the High Sustainable limit for that capacity if the Scheduling Coordinator will be submitting Ancillary Services bids for the Hybrid Resource</u></p>	The CAISO is considering this proposed change. The CAISO is working to develop a hybrid resource model in phase 2 of this initiative; however, hybrid resources will begin operating prior to implementation of this model. At present, the CAISO does not have enabling tariff language to support obtaining meteorological and outage information from the variable energy component of a hybrid resource. Scheduling Coordinators for such resources also have

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	<p>Again, since HSL is only a Hybrid Resource element (and then only for Ancillary Services provision – see above), suggest deferral to Phase II.</p>	<p>indicated they would like to continue to receive an informational forecast. For these reasons, the CAISO is proposing to include tariff language in Appendix A and section 4.6.2 as part of phase 1 of this initiative to establish a requirement for hybrid resources to provide this information subject to a forecast fee.</p>
4.8.2	<p>LSA/SEIA & EDF-R: Modify the last sentence of section 4.8.2:</p> <p>Where such Scheduling Coordinators for <u>Hybrid Energy Resources electing elect</u> to use the forecast provided by the CAISO, would they are also <u>be</u> subject to the Forecast Fee.</p>	<p>The CAISO is considering this proposed change.</p>