



## Stakeholder Comments Template

### Hybrid Resources Initiative: Straw Proposal

This template has been created for submission of stakeholder comments on the **Hybrid Resources Initiative, Second Revised Straw Proposal** that was held on May 7, 2020. The meeting material and other information related to this initiative may be found on the initiative webpage at:

<http://www.caiso.com/informed/Pages/StakeholderProcesses/HybridResources.aspx>

Upon completion of this template, please submit it to [initiativecomments@caiso.com](mailto:initiativecomments@caiso.com). Submissions are requested by close of business on May 28, 2020.

Submitted by	Organization	Date Submitted
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**Please provide your organization's comments on the following topics and indicate your organization's position on the topics below (Support, Support with caveats, Oppose, or Oppose with caveats). Please provide examples and support for your positions in your responses as applicable.**

EDF-R appreciates the opportunity to comment on the Second Revised Straw Proposal/Draft Final Proposal. In particular, EDF-R strongly supports the CAISO's rescission of its earlier proposal to require a single Scheduling Coordinator for all Resource IDs of a Mixed-Fuel Project and commends the CAISO for listening and responding to stakeholder feedback on this issue.

The comments below reflect EDF-R's views on the other elements of the CAISO's proposed framework. In addition to the categories provided in the comment template, EDF-R's feedback in the "Other Comments" section recommend that the CAISO:

- **Revise the CAISO's proposal to truncate the stakeholder process and take certain Co-located Resources proposals to the Board in July.** EDF-R does not believe that this rush is necessary to fix the Master File problem for those resources, and that the framework would be more coherent and rational by keeping the package together as a whole.
- **Adopt a stakeholder suggestion on the May 7<sup>th</sup> conference call to provide operating flexibility for the storage Resource ID in a Co-Located Resource configuration to accommodate Variable Energy Resource (VER) Resource ID production above real-time Dispatch Instructions.** This enhancement would avoid curtailment of the additional VER output without violation of the combined Point of Interconnection (POI) limitations.

EDF-R hopes the CAISO will give these and its other recommendations serious consideration and looks forward to seeing this input incorporated in the CAISO's next proposal package.

**1. Terms and Definitions:** Please provide your organization's feedback on the proposed terminology and definitions as described in the revised straw proposal.

### General feedback

The Proposal contains far fewer definitions than the prior Revised Straw Proposal, creating considerable confusion about whether the CAISO is still proposing the other definitions in the earlier version. The CAISO said on the May 7<sup>th</sup> stakeholder call that it was attempting to “simplify” the proposal, but EDF-R believes that many of the definitions proposed before were very helpful to understanding and clarification of this topic and should be retained. EDF-R suggests below edits to the definitions in the current Proposal, retention/edits to additional definitions in the prior version (with reasons for the changes), as well as suggested new definitions.

### Definitions included in the Proposal

**Hybrid Resource:** A ~~Mixed-Fuel Project resource type with comprised of two or more fuel type projects, or a combination of multiple different generation technologies that are physically and electronically controlled by a single owner/operator Interconnection Customer and Scheduling eCoordinator (SC) behind a single pPoint of iInterconnection (“POI”) that participates in the CAISO markets as a single resource with a single market #Resource ID, is optimized by the CAISO in the market as a single resource and is metered and telemetered at the high side of the interconnection transformer.~~ Hybrid #Resources are not eligible to be #Variable eEnergy #Resources.

#### Clean version

**Hybrid Resource:** 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.

**Co-located Resources:** A ~~Mixed-Fuel Project resource type~~ comprised of two or more Resource IDs, each with a single fuel type projects, or a combination of multiple different generation technologies behind a single point of interconnection that participates in the ISO markets as different resources with different market resource IDs, is optimized by the scheduling coordinator's bids or self-schedule in the market and each resource is individually metered and telemetered. Co-located #Resources may be comprised of one or more #Variable eEnergy #Resources and resources that are not #Variable eEnergy #Resources.

#### Clean version

**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.

### Definitions in the last Proposal version, but not in this one, that should be retained

**Mixed-Fuel #Type Project:** 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).

**Commented [SRS1]:** See below – Mixed-Fuel Project s is a helpful definition from the last proposal version that should be retained.

**Commented [SRS2]:** “Multiple” generation technologies would have to be different – delete “different” or “multiple.”

**Commented [SRS3]:** The CAISO clarified in the last stakeholder meeting the “single owner/operator” terminology was intended to denote a single IC, i.e., that it did not preclude ownership or operation by an IC that may consist of several LLCs or other entities.

**Commented [SRS4]:** Terms defined in the CAISO tariff should be capitalized.

**Commented [SRS5]:** By definition, a resource with a single Resource ID is optimized in the market as a single resource – no need to repeat that here.

**Commented [SRS6]:** CAISO drawings show that the metering location is not key to this definition, and the term “interconnection transformer” may be confusing where there are multiple Resource IDs (Hybrid and/or Co-located) behind a single POI.

**Commented [SRS7]:** See discussion below of EDF-R’s continuing concern about this restriction.

**Commented [SRS8]:** By definition, multiple Resource IDs are scheduled, settled, metered, and telemetered separately – no need to repeat that here.

**Commented [SRS9]:** Deleted for simplicity.

**Hybrid Resource Component:** The portion of a Hybrid Resource consisting of capacity of a single fuel type, e.g., a VER-storage Hybrid Resource consists of both a VER eComponent and a storage eComponent.

**Hybrid Resource VER Component Forecast:** Forecasted VER Component output capability at the POI (i.e., net of losses and auxiliary load).

**High Sustainable Limit (HSL):** The maximum output capability of the VER eComponent of a hHybrid rResource, based upon the full installed capacity of that eComponent. This data point should reflect the ~~VER components~~ high limit of the ~~net-to-grid~~ output for each VER eComponent of hHybrid rResources as established by the hHybrid rResource SC. This figure should be continuously updated in real-time at a 5-minute granularity to describe the maximum energy production capability of the hHybrid rResource VER eComponent.

**Commented [SRS10]:** Reflecting the CAISO's apparent elimination of the "net-to-grid" terminology.

**Additional EDF-R comments on the HSL:** Contrary to the statements in the Proposal, this element was not sufficiently addressed in the prior proposal. There was considerable confusion, in stakeholder meetings and off-line discussions, about the HSL measure and what it is supposed to be or do. Specifically, it was not clear how it would be calculated, what additional equipment might be needed to provide it, and how CAISO would use this information. It also seemed like the CAISO had all the information needed to provide it, e.g., installed VER capacity and meteorological data, and the CAISO was unable to clearly explain what additional information was needed.

The CAISO committed to providing additional information and examples in this Proposal version, but neither the Proposal document nor the meeting presentation contained that follow-up information. EDF-R requests that the CAISO do so in the next version, and allow adequate discussion and comment opportunities to clarify any remaining issues.

**Hybrid Resource ~~Net-to-Grid Operational Forecast~~ Dynamic Limit Tool:** The means by which the Hybrid Resource SC may provide an operational forecast of the overall capability of the hHybrid rResource as a whole, provided by the hybrid resource SC, netting the operations of all Components, to the CAISO. This ~~net-to-grid operational~~ forecast should incorporate the following: Any VER eComponent ~~fForecasted output~~, any storage eComponent State-of-Charge forecast, and the anticipated charging or discharging operation of any storage eComponent. ~~All of these aspects should all be incorporated in this self-provided net-to-grid operational forecast.~~ This ~~net-to-grid operational~~ forecast will only be provided and utilized in ~~the CAISO's~~ Real-Time markets and is optional on the part of the Hybrid Resource SC.

#### **Clean version**

**Hybrid Resource Dynamic Limit Tool:** 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.

**Definitions that should be added:** Aggregate Capability Constraint (ACC). This appears to be the new proposed term for POI limitations applicable to Co-located Resources. As noted below, this limitation should apply only to resources in that configuration, and not to Hybrid Resources behind the same POI.

**2. Market Interaction for Hybrid Resources:** Please provide your organization's feedback on the market interaction for hybrid resources proposal, as described within the second revised straw proposal.

**NGR vs. Generator:** The Proposal states says most Hybrid Resources would be modeled as Non-Generator Resources (NGRs). If they cannot charge from the grid, their Pmin could be set at zero (not a negative value, which would allow grid charging).

However, a 2016 CAISO Technical Bulletin (<http://www.caiso.com/Documents/TechnicalBulletin-ImplementationofHybridEnergyStorageGeneratingFacilities.pdf#search=Implementation%20of%20Hybrid%20Energy%20Storage%20Generating%20Facilities>) stated that such a configuration could be modeled as either a Generator (only a positive Pmin) or an NGR. There was considerable discussion at the stakeholder meeting about the difference (for a Hybrid Resource with ITC grid-charging limitations) between modeling the resource as a Generator vs. an NGR with a Pmin of zero. CAISO should further consider advantages and disadvantages of these two apparent alternatives in the next proposal version.

**Different rules for different hybrids:** The Proposal states that gas-storage hybrids may still be modeled as Generators if the storage is small compared to generation, since they would "generally behave and be dispatched like a gas resource." However, VER-storage hybrids will not be modeled as VERs, even if the storage is relatively small compared to the generation and such resources would presumably "generally behave and be dispatched" like a VER.

The CAISO's proposed inconsistent treatment of gas-storage and VER-storage hybrids highlights a comment EDF-R has made on the past two CAISO proposals in this initiative – that adding storage to a resource of a different fuel type does not then mean that the resulting resource no longer has the characteristics of the original fuel type. EDF-R has proposed that the CAISO allow the VER portion of a Hybrid Resource to retain VER status, recognizing that its output is no more predictable than before the storage addition, and EDF-R still believes that this is a workable and logical construct.

Assuming the Hybrid Resources configuration is retained, the CAISO should either treat both gas-storage and VER-storage Hybrid Resources the same (i.e., allow VERs with some amount of storage to retain VER status) or justify the proposed inconsistent treatment. CAISO should also work with stakeholders to develop a logical threshold for the relative size of storage and non-storage capacity that would indicate one treatment or the other, instead of leaving this determination on a case-by-case basis, with no defined decision criteria – a recipe for uncertainty and inconsistent/discriminatory treatment.

**3. Point-of-Interconnection (POI) Constraint for Co-Located Resources:** Please provide your organization's feedback on the POI constraint for co-located resources proposal, as described within the second revised straw proposal.

EDF-Rs's comments in this area cover two topics: (1) Clarifications about the nature of Master-File limitations and ability of different Mixed-Fuel Resource configurations to participate in CAISO markets; and (2) recommendations about how to structure the "fix" that CAISO is proposing.

#### **Master File limitations**

It was apparent from the May 7<sup>th</sup> discussion that CAISO Master File limitations, and therefore resulting Energy and A/S restrictions, are much more complex than simplistic "either/or" Hybrid vs. Co-located Resource distinction. For example, Multiple Resource IDs behind a single Mixed-Fuel Project POI could include one or more Hybrid Resources and/or Co-Located Resources.

The CAISO statements at the meeting were inconsistent, saying both that Hybrid Resources grouped with other resources behind the same POI would each be treated as Co-located Resources for this purpose, and that GIA co-tenancy provisions (which usually allocate discrete amounts of the overall Project Pmax to different portions or phases, then Resource IDs) would be "honored."

The CAISO should clarify that Master File limitations, and therefore the resulting limits on Energy and Ancillary Services bids and awards before ACC implementation, only apply to Hybrid and Co-located Resources behind a single POI where the maximum output at the POI is not sufficient to accommodate the simultaneous maximum output (Pmax) of the different Resource IDs, and then only to the Co-located Resource IDs that are sharing a fixed amount of capacity at the POI.

The examples below illustrate these points. EDF-R requests that the CAISO verify that these examples are correct and provide additional illustrations where helpful.

- **Co-located Resources where the POI limit accommodates the full output of the separate resources**, e.g., where the project was a Mixed-Fuel Project in the Interconnection Request.

**Example 1:** MFP with 150 MW Pmax, 100 MW of solar + 50 MW of storage

**Resource ID 1:** 100 MW Pmax, 100 MW solar

**Resource ID 2:** 50 MW Pmax, 50 MW storage

Pmax assignment to these resources can follow the current Master File rules, i.e., their combined Pmax would not exceed the overall Project Pmax. Thus, they can each be listed at full Pmax and fully participate in CAISO markets, subject to their respective limits at the POI.

- **Hybrid Resources with a fixed allocation of capacity at the POI** that are grouped with other Hybrid Resources or Co-located Resources.

**Example 2:** MFP with 100 MW Pmax, 100 MW solar + 60 MW storage

**Resource ID 1:** Hybrid, 70 MW Pmax, 70 MW solar + 40 MW storage

**Resource ID 2:** Hybrid, 30 MW Pmax, 30 MW solar + 20 MW storage

Pmax assignment to these resources can follow the current Master File rules (their combined Pmax  $\leq$  overall Project Pmax), so they can each be listed at full Pmax and fully participate in Energy and Ancillary Services markets, subject to their respective limits at the POI. For

Master-File purposes, these Resource IDs are effectively the same as a phased solar-only project, where each phase has its own portion of the overall project Pmax, and they should be treated the same in CAISO markets.

**Example 3:** MFP with 100 MW Pax, 100 MW solar + 60 MW storage

**Resource ID 1:** 40 MW Pmax, Hybrid, 40 MW solar + 20 MW storage

Co-located Resources, sharing 60 MW Pmax: **Resource ID 2:** 60 MW solar  
**Resource ID 3:** 40 MW storage

Pmax assignment between the Hybrid Resource ID (Resource ID 1) and the Co-located Resource IDs (2 and 3) can follow the current Master File rules.

Because Resource ID 1 would be assigned a discrete portion (40 MW) of the overall Project Pmax, it can be listed at full Pmax in the Master File and offer both Energy and Ancillary Services, subject to that Pmax limit.

However, the Co-located Resource IDs (Resource IDs 1&2) would share the remaining 60 MW of the overall Project Pmax. Thus, they cannot be fully accommodated under current Master File rules, and their full Pmax listing and market participation must await ACC implementation.

### **ACC applicability optimization**

This optimization should apply within each Resource ID (Hybrid Resources) or between associated Co-located Resources, but not between . In Example 3 above, for instance:

- Resource ID 1 may offer both Energy and Ancillary Services, and CAISO market algorithms would properly optimize between those offers, as with any stand-alone resource. There should be no congestion adjustment behind the POI based on offers from Resource IDs 2 or 3, since Resource ID 1 has its own discrete 40 MW POI capacity assignment that should not be impinged on by Resource 2 or 3 bids or market awards.
- Resource IDs 2 and 3 may offer both Energy and Ancillary Services (subject to ACC implementation, and CAISO market algorithms would properly optimize between them, subject to their joint POI capacity assignment. Congestion management behind the POI can be applied to their joint 60-MW POI capacity, but their market bids and awards should not exceed that 60-MW limit.

A more complex example can further illustrate this point.

**Example 4:** MFP with 200 MW Pax, 200 MW solar + 100 MW storage

**Resource ID 1:** 40 MW Pmax, Hybrid, 40 MW solar + 20 MW storage

Co-located Resources, sharing 60 MW Pmax: **Resource ID 2:** 60 MW solar  
**Resource ID 3:** 40 MW storage

Co-located Resources, sharing 100 MW Pmax: **Resource ID 4:** 100 MW solar  
**Resource ID 3:** 40 MW storage

- **Hybrid Resource ID 1** may offer both Energy and Ancillary Services, and CAISO market algorithms would properly optimize between those offers, as with any stand-alone resource. Resource ID 1 has its own discrete 40 MW POI capacity assignment that should not be impinged on by bids or market awards from/to other Resource IDs behind the POI, i.e., there should be no congestion adjustment behind the POI based on offers from Resource IDs 2-5.
- **Co-located Resource IDs 2 and 3** may offer both Energy and Ancillary Services (after ACC implementation), and CAISO market algorithms would properly optimize between them, subject to their joint 60 MW POI capacity assignment. Congestion management behind the POI can be applied to their joint 60-MW POI capacity, but their market bids and awards should not exceed that 60-MW limit.
- **Co-located Resource IDs 4 and 5** may offer both Energy and Ancillary Services (after ACC implementation), and CAISO market algorithms would properly optimize between them, subject to their joint 100 MW POI capacity assignment. Congestion management behind the POI can be applied to their joint 100-MW POI capacity, but their market bids and awards should not exceed that 100-MW limit.

**4. Metering:** Please provide your organization’s feedback on the metering topic, as described within the second revised straw proposal.

EDF-R has no comments on the brief metering discussion in the Proposal, as the elements seem to be the same as in the prior proposal version. However, EDF-R would appreciate additional discussion on REC reporting for both Hybrid and Co-located Resources, e.g., treatment of round-trip storage losses.

**5. Resource Adequacy:** Please provide your organization’s position on the Resource Adequacy topic, as described in the second revised straw proposal.

EDF-R’s overall comment about the Resource Adequacy topic in the Proposal (and the associated Must-Offer Obligations (MOOs)) is that there is almost no mention of those topics in the Proposal. The following issues are among the many RA and MOO topics not addressed in the Proposal.

**RA methodology for MFPs without ITC charging limitations:** The CPUC’s January 2020 Interim Decision in Rulemaking 17-09-020 did not address this issue, and the the CPUC’s Proposed Decision (PD) issued May 22 in Rulemaking 19-11-009 seems to decline to adopt Qualifying Capacity values for MFPs without ITC charging limitations<sup>1</sup>. The CAISO should confirm that the “additive” methodology (subject to POI limitations) would determine both Hybrid Resource and Co-located Resources QCs where there are no ITC charging limitations.

<sup>1</sup> Decision Adopting Local Capacity Obligations For 2021-2023, Adopting Flexible Capacity Obligations For 2021, And Refining The Resource Adequacy Program in R.19-11-009. The PD states at p. 27: “The Working Group notes, and we agree, that more discussion is needed on how to treat ITC Limited (75 – 99 percent on-site) charging and non-ITC Limited scenarios as it is unclear how resources will respond to CAISO’s must-offer obligation in these cases.”

### **Must-Offer Obligations**

- **Hybrid Resources MOO:** The Proposal states that Hybrid Resources would have a “24 x 7” MOO but does not state the level of the MOO. It would be logical to assume that MOOs would be tied into RA values (e.g., NQC), but that is not discussed at all in the Proposal.

The prior CAISO previous proposal said the CAISO supported the “higher of” QC methodology, with the MOO determined by the Component setting the QC in a given month. So, if the solar Component QC is higher, the MOO would be the same as a solar-only project, i.e., real-time only and determined by the VER forecast. In that situation, the MOO would not be 24 x 7 at all. (The PD methodology, which would reduce the solar component QC for grid charging by MFPs with ITC limitations, would presumably reduce MFP QCs, NQCs, and perhaps MOOs for those resources.)

As with the CAISO’s prior proposal, the Proposal does not address how deliverability transfers would affect the MOO under either the “higher of” methodology (e.g., where deliverability had been transferred to the storage portion but the solar portion has the higher QC or the PD methodology.

- **Co-located Resources MOO:** The Proposal also does not discuss how the CPUC “higher of” interim methodology would apply to Co-located Resources, e.g., if deliverability is transferred to the storage Resource ID but the solar Resource ID QC is higher in a given month.
- **PCDS MOO:** The Proposal also does not address how MOOs would be determined for Partial Capacity Deliverability Status (PCDS) resources. PCDS resources may be more prevalent in the future, especially with recent project activity adding storage and transferring RA deliverability from original capacity to the storage capacity. For example:
  - Where the added storage is large, deliverability transferred to storage may not be enough to designate the storage as Full Capacity Deliverability Status (FCDS); and
  - Where the added storage is small, deliverability transfers to make the storage FCDS may leave some deliverability with the original capacity, making it PCDS.

The CAISO should clarify how MOOs and other elements of the Proposal would apply for PCDS resources. For example, an FCDS VER must bid forecasted output into the RT market; if a VER is PCDS, would it be required to bid only a fraction of that forecast – e.g., if it’s 80% PCDS, would it only have to bid 80% of the forecast? How would that work with PIRP?

### **Use of outage cards**

The Proposal suggests a method for Hybrid Resources to accommodate storage charging by associated generation that includes use of the proposed Dynamic Limit Tool to communicate net availability of the entire resource, combined with submission of outage cards to indicate reduced availability for generation and storage capacity. While this proposal might reflect the specific on-site charging process, EDF-R is concerned that this procedure could impair a project’s RA value.

Under the current RAIM provisions, that would not happen as long as the outage cards are submitted for periods outside the defined Availability Assessment Hours (AAHs) – currently 4-9pm. However, under the CAISO’s latest RA Enhancements Initiative proposal, submittal of outage cards in any hours could impact the proposed Unforced Capacity (UFOR) measure for that resource, reducing the amount that could be claimed by an LSE off-taker to meet that requirement.



When stakeholders raised this issue at the May 7<sup>th</sup> meeting, the CAISO dismissed this concern as something to address in that other initiative. However, the CAISO's proposed "solution" to this issue in this initiative does not resolve the problem if its own proposals in the other initiative will cause a different (and possibly worse) problem. The CAISO should not permit such a "silo" effect and should consider its proposals in both initiatives so that they compliment, and do not conflict with, each other.

**Additional comments**

Please offer any other feedback your organization would like to provide on the Hybrid Resources Initiative.

**Process/schedule**

- **Accelerating Co-located Resource proposals to July Board meeting:** CAISO justified this acceleration by citing the urgent need to file tariff changes at FERC to fix the Master File problem for Co-located Resources using an Aggregate Capability Constraint (ACC), by Fall 2020 for resources providing Energy (not Ancillary Services, planned for Fall 2021). However:
  - CAISO should not need a tariff change to modify its Master File. As communicated in stakeholder comments on the last Proposal version, the need for this fix is so obvious and urgent that the CAISO should start working on the ACC now.
  - Many aspects of the Co-located Resource proposals require additional work to ensure that bidding and market awards are compatible with the ways in which these projects are being contracted.
- **Full CCA implementation:** The CAISO should provide a clearer explanation of the need to implement the CCA in two stages, i.e., not addressing Ancillary Services until Fall 2021. It was clear from the May 7<sup>th</sup> meeting discussion that allusions to "possible unintended consequences" and needs to "test thoroughly" have not proved convincing to stakeholders.

**Mitigating VER production concerns through storage flexibility**

EDF-R appreciates and strongly supports the CAISO's withdrawal of the "single SC per POI" proposal. EDF-R agrees with the CAISO's new position to use other tools to address its concerns that the ability of VERs to exceed CAISO Dispatch Instructions under most conditions could provide incentives to exceed the POI limitation for Co-located Resources. However, the current proposed framework would effectively require curtailment of the additional VER Resource ID production if needed to meet the applicable POI limitations, since the storage Resource ID must continue to follow CAISO Dispatch Instructions.

At the May 7<sup>th</sup> meeting, 8minutesolar Energy suggested that the CAISO allow the storage Resource ID to deviate from RT Dispatch Instructions as needed to accommodate any unexpectedly higher VER Resource ID output. A more formal means to accomplish the same ends would be to allow the storage Resource ID to update its bids within real time.

**CAISO****Hybrid Resources Initiative**

EDF-R understands the CAISO's preference to treat Co-located Resources as separate projects; however, this sensible proposal would give Co-located Resources the same flexibility as Hybrid Resources to accommodate the socially valuable additional VER production while reducing the potential for POI limitation exceedance. It would also make the Co-located Resource model – which is the CAISO's stated preferred Mixed-Fuel Project configuration – more attractive to project operators and off-takers.