



**Comments of the California Energy Storage Alliance (CESA)
on the CAISO
Hybrid Resources Issue Paper**

Submitted by	Organization	Date Submitted
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CESA appreciates the CAISO's leadership in exploring market participation matters for hybrid resources. CESA provides general remarks on the Hybrid Resources initiative and the Issue Paper topics and also provides responses to the 'comments template' provided by the CAISO.

CESA strongly supports the CAISO's efforts to explore hybrid resources and believes this effort is timely and important. Many energy storage developers are actively developing resources to the market that may involve hybrid configurations. Such developers seek to support the CAISO and state energy stakeholders by ensuring resources are built and operating to meet policy needs, support reliability, and achieve other goals, including providing least-cost best-fit solutions where applicable.

The CAISO should consider how hybrid resources can support reliability benefits and operate, in some configurations, as better behaving resources. The CAISO consider solutions whereby any functionalities associated with participating intermittent renewables (PIR) status do not unintentionally or perversely limit the appetites of developers to pursue and support resources that have more dispatchability and enhanced operations. The CAISO should thus consider how developers i) make seek to operate hybrid resources as a single resource with a single optimized RA count, even if participating under one or two resource IDs in the CAISO market ii) how developers incorporating the solar Federal Investment Tax Credit (ITC) may size and operate hybrid resources in ways that cannot readily be reflected in economic bids under current models yet which are economical for developers and ratepayers and iii) how the PIR status could still be applicable for some VERS with slightly modified performance and scheduling profiles, i.e. 'better behaving'. Small additions of energy storage to a solar resource, for instance, may be able to enhance the capacity value of that combined resource, even if the resource still functions largely as a solar resource.

As an independent system operator, the CAISO allows non-discriminatory market participation by an array of market participants. The CAISO's interconnection queue

indicates resource configurations which planned or eyed for development, typically in response to expected needs, cost trajectories, and other factors. The role of hybrid resources should be expected to be a part of the CAISO's resource mix. Recent efforts regarding Federal ITC legislation may accelerate the deployment of hybrid resources. Hybrid resources may also provide benefits in the forms of cost-savings, firmer operations, different operating ranges, or other benefits.

The CAISO should continue to define key terms, including the concept of 'hybrid resources'. The CAISO's definition should differentiate between *co-located resources* that operate independently (and may also have separate 'full deliverability'), from *hybrid resources* which operate interactively. Put another way, the operations of 'hybrid resources', as CESA defines it, are generally enmeshed. The permutations of hybrid resources can often include provisions about how one resource might fuel another, how joint operations collectively can improve (or worsen) ITC capture or performance for purposes of determining an Effective Load Carrying Capability (ELCC) 'counts', or can include shared deliverability (as opposed to full deliverability for each separate sub-resource.)

CESA also believes the CAISO should anticipate that resource schedulers may have various reasons for scheduling resources, and the CAISO should seek to reasonably support various participation paths, including single or double-resource ID configurations. CESA observes that many resources may have many operating goals, and not all goals may readily be expressed in scheduling bids or practices. As such, the CAISO should expect that resources may want flexibility in their scheduling practices, and a one-size fits all approach will likely be flawed. This said, CESA recognizes that the CAISO has and continues to be a leader in developing market participation models for energy storage and other market resources, and CESA appreciates the CAISO's leadership and prescience in developing market participation models to meet CAISO goals. Such prescience can also inform potential rule changes for the market at large, such as through considerations of a lower bid floor.

Clearly, the resource composition of the CAISO's market is changing and the CAISO should take steps to ensure its market promotes rich participation while meeting reliability needs. CESA greatly looks forward to this initiative and believes the CAISO's efforts to define, assess, and address any issues, barriers, or market reform needs for hybrid resources will greatly support a robust and competitive CAISO marketplace replete with resources that support critical reliability and policy goals.

CESA Comments on the CAISO Comments Response Template:

1. Interconnection

Please provide your organization's feedback on the interconnection topic as described in section 3.2.

CESA Response: *CESA supports consideration of the interconnection paths and provisions for hybrid resources. Generally, the interconnection options support the main interconnection approaches considered by storage-plus developers. This part of the CAISO's protocols has been developed sufficiently to date.*

CESA still anticipates that the hybrid resources initiative may identify improvements to many aspects of the CAISO, including changes to the CAISO interconnection configuration options. The CAISO fundamentally structures the PIR path to work for raw renewable resources, but provisions to expand the PIR path to allow for storage-plus renewable resources may be useful, especially if such resources can perform more effectively and usefully. The CAISO should ensure its market appropriately rewards the added performance benefits of storage, and should avoid incentives to bring only 'wild' renewables to its market.

CESA supports discussion and explication of any challenges with RPS reporting or of other factors which may add barriers to the development of hybrid resources.

With regards to material modifications, additions, repowering, or new resources studies, CESA strongly urges the CAISO to continue to develop pathways that work with a developers plans and which may lead to some flavor of 'constrained operations'. For instance, many developers seek to interconnect storage with solar with the express intent to not charge a storage device from the grid during peak periods. Interconnection provisions should reasonably accommodate reasonable operating plans, and could establish operating provisions or technical solutions that ensure actual operations generally comport with studied approaches. This step may help many resources come online affordably, supporting the CAISO's operations, and generally leveraging energy storage resources to meet grid needs in reasonable ways, e.g. by charging off peak and discharging on-peak or after solar output drops off.

Following the previous point, CESA expects it may help to revisit or further explore approaches for limiting total output to studied and approved levels. Some hybrid resources may not seek deliverability beyond the output of the 'master-resource', e.g. solar, so as to avoid any additional deliverability charges. With onsite change of storage at a solar farm, for instance, a resource may be overlarge for its deliverability. These types of configurations should be determined by the developer and not limited by the CAISO aside from limiting actual power flows to agreed-upon levels for both studies and operations.

2. Forecasting and Operations

Please provide your organization's feedback on the forecasting and operations topics as described in section 3.3.

CESA Response: *CESA supports these considerations as part of the CAISO's Hybrid Resources initiative. CESA requests the CAISO continue to explore and allow single-resource configurations of hybrid resources by identifying (as was done in the issue paper) how developers may have trade-offs if choosing one versus two resource IDs. Developers should reasonably have choices in order to develop resources smartly,*

and the CAISO should highlight how such choices may involve different forecasting, scheduling, settlement paths, etc.

The CAISO should assess how historical operating profiles of solar plus storage resources could be used to reasonably forecast such resources' outputs in future years. Such resources may be easier to forecast than 'wild' resources (without solar), and modest investigations by the CAISO may reveal that solar plus storage resources can operate as more predictable PIRs.

3. Markets and Systems

Please provide your organization's feedback on the markets and systems topics as described in section 3.4.

CESA Response: *CESA supports these considerations as part of the CAISO's Hybrid Resources initiative.*

CESA strongly supports considerations of approaches that do not artificially limit the output capacity of hybrid resources. CESA supports considerations of counting approaches that properly value hybrid resources. To the extent that such resources are more 'firm', dispatchable, or valuable, different counting conventions should be considered.

CESA has suggested that hybrid solar plus storage resources warrant their own 'count', and has suggested the CPUC address this matter for multiple years. The CAISO too should address this, if only through its 'default counting convention'. Many groups participate in the CAISO that are not under CPUC Resource Adequacy (RA) rules, and the CAISO should ensure all resources and LSEs understand how firmer VERs have different operating profiles compared with the wilder PIRs and thus how firmed VERs warrant a higher RA count (unless the storage seeks its own stand-alone RA count which may happen in some but not all instances).

4. Ancillary Services

Please provide your organization's feedback on the ancillary services topic as described in section 3.5.

CESA Response: *CESA supports these considerations as part of the CAISO's Hybrid Resources initiative. CESA believes resources combined with energy storage may have abilities to cost-effectively ramp, idle, or otherwise provide Ancillary Services. These functionalities seem mostly available but a thorough consideration of any issues, of performance and DOT requirements depending on configurations, and of no-pay or payment rescissions should be reviewed as part of this initiative.*

5. Deliverability

Please provide your organization's feedback on the deliverability topic as described in section 3.6.

CESA Response: *CESA supports these considerations as part of the CAISO's Hybrid Resources initiative. Proper consideration of deliverability, including with additions, will be important. CESA again suggests that the CAISO and stakeholders define 'hybrid resources' to reflect enmeshed resources combinations, as opposed to co-located but separate resource configurations.*

6. Resource Adequacy

Please provide your organization's feedback on the resource adequacy topic as described in section 3.7.

CESA Response: *CESA supports these considerations as part of the CAISO's Hybrid Resources initiative. This initiative may be well suited to develop RA counting considerations that can be stand-alone or that could inform other RA-related policy development proceedings or forums.*

CESA supports considerations of the legal requirements and statutory codes for RA counts for hybrids. As such resources may operate materially differently from traditional stand-alone resources, such as stand-alone solar, it seems logical that RA counts should differ. CESA supports consideration of exceedance or new methodologies, and the CAISO should think of methodologies beyond ELCC, while ensuring the reliability performance (in planning capacity) of such resources are properly understood and valued.

7. Metering, Telemetry and Settlements

Please provide your organization's feedback on the metering, telemetry and settlements topics as described in section 3.8.

CESA Response: *CESA supports these considerations as part of the CAISO's Hybrid Resources initiative. CESA believes the CAISO should consider cost-elements as part of this and should not unduly burden resources with unnecessary costly additions if not warranted. Methodologies such as estimations or other approaches may be considered to provide sufficient information to the CAISO for settlements, metering, and perhaps Telemetry. CESA looks forward to considering options that balance between costs and necessary accuracy.*

8. Additional comments

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

CESA Response: *The CAISO should ensure its considerations for hybrid resources appropriately authorize key use-cases of storage. These may include storage operated with solar and operated so that the ITC fully applies to the energy storage system. Similarly, some solar plus storage resources may seek to improve performance for purposes of the ELCC calculation. These use cases should be authorized, are predictable something that developers may pursue, and do not conflict with CAISO operational goals nor with ratepayer goals to develop least cost best fit resources.*