



**Storage Design and Modeling:**

**Discussion Paper:**

**Mixed-Fuel and Distribution-Level  
Resources**

June 2, 2025

**Storage Design and Modeling:  
Mixed-Fuel and Distribution-Level Resources**

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## Storage Design and Modeling: Mixed-Fuel and Distribution-Level Resources

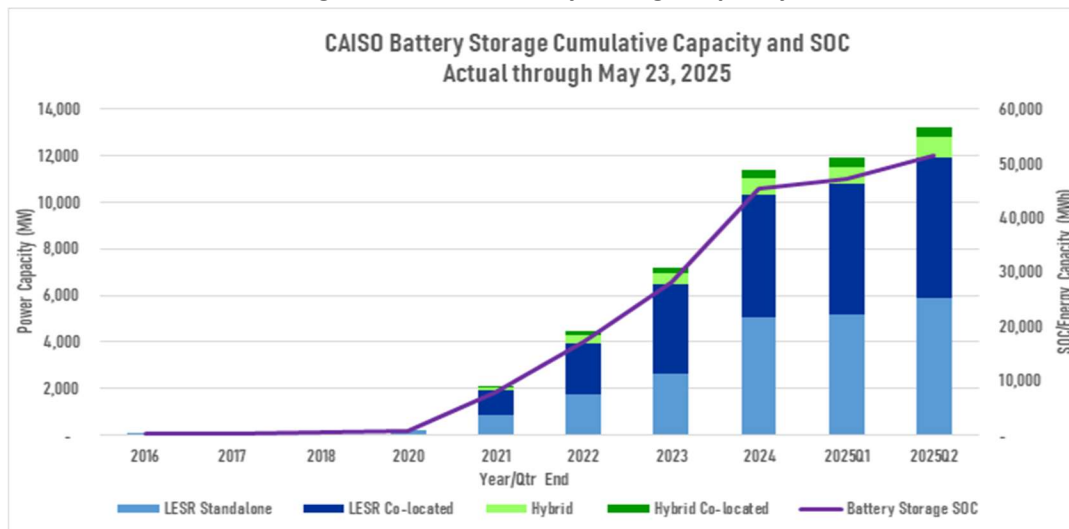
### 1. Overview

With California's transition to a clean energy fleet, the ISO has added large amounts of renewable resources, like wind and solar, to the electricity grid. Sometimes, these resources generate electricity that is more valuable in the future than serving immediate demand. Storage resources increase immediate demand and shift supply to later hours, allowing for the use of energy when most valuable. Storage resources have proliferated in California over the last 5 years. Battery storage capacity has soared from approximately 500 MW in 2020<sup>1</sup> to 13,248 MW as of May 23, 2025.<sup>2</sup>

Storage resources participate in ISO markets as stand-alone assets or as mixed-fuel resources. Stand-alone storage resources participate as an individual battery storage resource and are modeled using the non-generator resource (NGR) model. Mixed-fuel resources come in two forms: hybrid and co-located resources. Hybrid resources combine two assets with different fuel types behind the same point of interconnection. The ISO sees hybrids as a single resource, modeled as a non-generating resource (NGR). As of May 23, 2025, 1,353 MW of battery capacity participated as hybrid resources. Co-located resources consist of two resources of different fuel types that share an interconnection with each other. The ISO sees the underlying components of co-located resources as separate from each other. As of May 23, 2025, 5,998 MW of co-located batteries participated in the ISO market.

Storage resources may interconnect at the transmission level through the ISO process or at the distribution level through the applicable distribution provider's process. Resources connected through the distribution level and participating in the ISO markets are referred to herein as distribution-level resources. This paper does not address non-participating distribution-level resources.

**Figure 1: CAISO Battery Storage Capacity**



<sup>1</sup> DMM, "Special Report on Battery Storage", July 2023, at 3.

<sup>2</sup> This figure includes 365 MW of commercial operation for markets (COM) capacity. These resources have a portion of the capacity certified to participate in markets with requirements outstanding to achieve their commercial operation date (COD), like incomplete phases or pending network upgrades. The ISO's monthly "Key Statistics" figure does not include COM capacity.

## **Storage Design and Modeling: Mixed-Fuel and Distribution-Level Resources**

This paper provides a common understanding on hybrid, co-located, and distribution-level storage resources in preparation for topic group problem statement development. The paper also reiterates concerns shared by stakeholders in prior Storage Design and Modeling initiative meetings.

**This paper will provide topic overviews on:**

1. ISO grid operators' limited visibility into potential operational limitations of distribution-level resources due to distribution-level charging or discharging limitations.
2. The high sustainable limit and ensuring high-quality data reporting to the ISO.
3. Default energy bids for hybrid resources.
4. Dynamic limits, their current functionality, and potential opportunities for enhancements or extensions.

Developments on the above topics and other storage topics are organized under the [Storage Design and Modeling initiative](#).

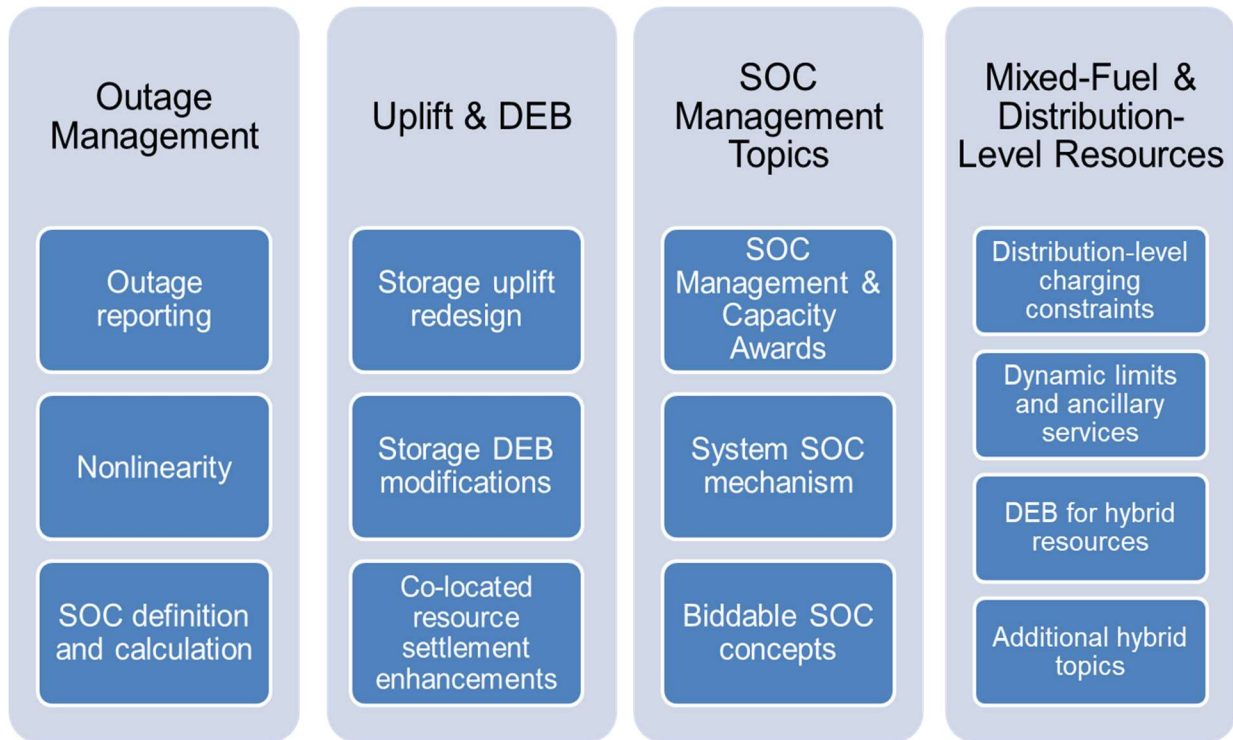
## **2. Initiative Background and Schedule**

Under the Storage Design and Modeling initiative, the ISO, market participants, and other stakeholders identify challenges and discuss potential improvements related to energy storage within ISO markets, processes, and operations. This comprehensive storage initiative provides background, develops problem statements, and ultimately designs solutions to challenges faced by all stakeholders, including the ISO. The initiative is organized into four topic groups: Outage Management, Uplift & DEB, SOC Management, and Mixed-Fuel and Distribution-Level Resources. These topic groups provide structure for discussion while maintaining the potential for quick resolution of warranted topics across groups. This discussion paper focuses on the Mixed-Fuel and Distribution-Level Resources topic group.

Figure 2 shows initiative topics organized by topic group. The ISO has moved the co-located settlement enhancements topic to the Uplift & DEB topic group. This shift ensures non-generating resource (NGR) uplift modifications consider unique contractual, settlement, and operational aspects of co-located resources, like optional charging restrictions and multiple off-takers. Figure 3 provides upcoming initiative milestones.

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**Figure 2: Updated Topic Groups**



**Figure 3: Updated Timeline**

Dates	Outage Management	Uplift & DEB	SOC Management	Mixed-Fuel & Distribution-Level Resources
June 2				<b>Posting: Discussion Paper</b>
June 11		Comments due: May 28 meeting	Comments due: May 28 meeting	
June 30	<b>Posting: Revised Straw Proposal</b>	Stakeholder meeting	Stakeholder meeting	Stakeholder meeting
July 16		Comments due: June 30 meeting	Comments due: June 30 meeting	Comments due: paper & meeting
Aug. 6	Stakeholder meeting	Stakeholder meeting	Stakeholder meeting	
Aug. 20	Comments due: paper & meeting	Comments due: August 6 meeting	Comments due: August 6 meeting	
Sept. 12		<b>Posting: Straw Proposal</b>		

## **Storage Design and Modeling: Mixed-Fuel and Distribution-Level Resources**

In developing this discussion paper, the ISO considered feedback from: Working Group Session 1 (December 12, 2024), thirteen subsequent sets of written comments, Working Group Session 3 (February 20, 2025), thirteen subsequent sets of written comments, and the Regional Issues Forum (April 9, 2025). The ISO encourages stakeholders to provide verbal feedback during the June 30<sup>th</sup> working group meeting, and written comments, due July 16, 2025. Stakeholder feedback is fundamental to good policy development. The ISO thanks each stakeholder who has shared their perspective in verbal and written comments so far. The ISO looks forward to continuing engaging with stakeholders through a transparent, respectful, and inclusive stakeholder process.

### **3. Distribution-Level Resources: Charging Constraints**

#### **Background**

Distribution-level storage resources interconnect through the distribution network, instead of direct interconnection to the CAISO-controlled bulk transmission system. The distribution network refers to the wires between the ISO's bulk transmission system and the end-use customer. The distribution provider, often a local utility (e.g., PG&E), runs the distribution network. Distribution-level storage resources (participating in ISO markets) generally interconnect under a wholesale distribution access tariff (WDAT), established by the respective distribution provider.<sup>3</sup> Distribution-level storage resources providing wholesale energy must also follow the ISO tariff's market participation rules.

PG&E, SCE, and SDG&E's WDATs state that in the event of conflicting instructions between the distribution provider and the ISO, resources should follow the ISO's instructions, unless human safety or electric facilities would be knowingly put at risk.<sup>4</sup> Importantly, the distribution provider may impose certain charging and discharging restrictions, per the WDAT and corresponding generator interconnection agreement (GIA). For example, in Southern California Edison's (SCE) WDAT, ISO schedules may be curtailed "if a constraint on the Distribution Provider's Distribution System cannot be relieved through the implementation of other procedures and the Distribution Provider determines that it is necessary to curtail ISO-scheduled deliveries."<sup>5</sup>

For curtailment, retail and wholesale distribution load receive highest priority, followed by firm charging, and then as-available charging of storage resources. These charging restrictions may create issues for current and future storage resource dispatch by the ISO. For example, a storage resource, unable to charge in the afternoon because of distribution-level charging restrictions, may be unable to discharge in the evening.

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<sup>3</sup> There are some exceptions to this rule, such as storage resources participating in distributed energy resource aggregations; however, most participating storage interconnects through a WDAT.

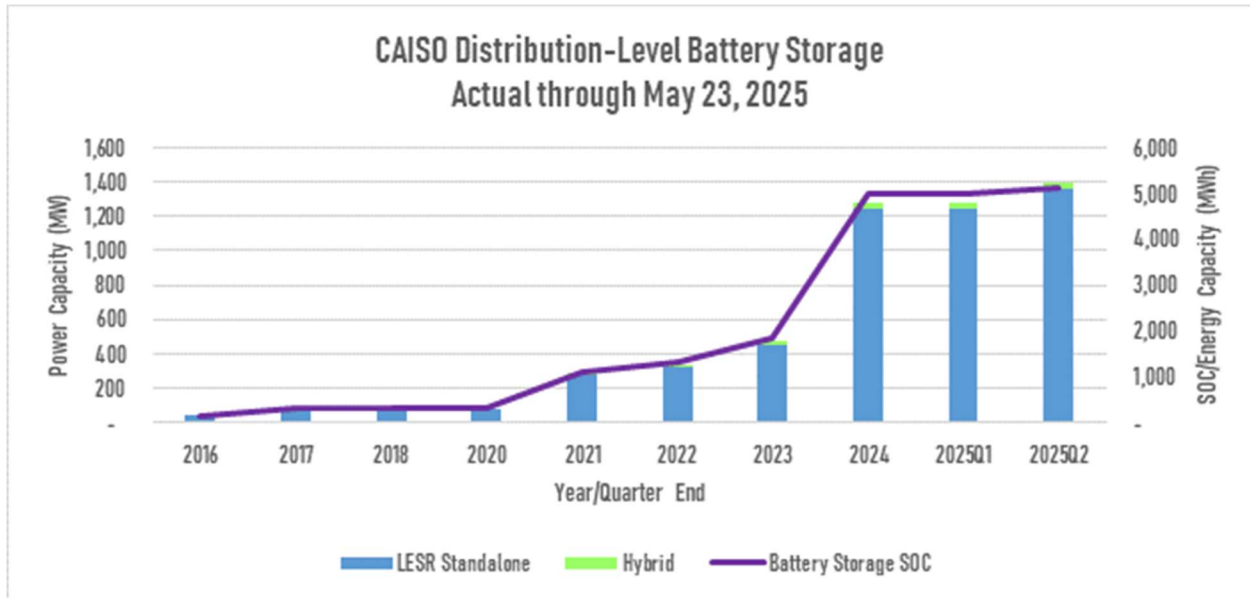
<sup>4</sup> Pacific Gas and Electric Company, "Wholesale Distribution Tariff," January 2024, at 41; Southern California Edison, "Wholesale Distribution Access Tariff," March, 2024, at p. 41; San Diego Gas and Electric, "Wholesale Distribution Access Tariff," August 2024, at 27.

<sup>5</sup> Southern California Edison, "Wholesale Distribution Access Tariff," March, 2024, at p. 31.

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Figure 4 shows the growth of distribution-level battery storage since 2016. As of May 23, 2025, 1,361 MW of distribution-level storage capacity and an additional 36 MW of distribution-level hybrid storage capacity participated in the market.

**Figure 4: CAISO Distribution-Level Battery Storage Capacity**



### Stakeholder comments

In the December 11, 2024, and the February 20, 2025, comments, ten stakeholders provided feedback on the distribution-level resources topic. Two stakeholders supported and one stakeholder was open to identifying distribution-level resources in the Master File to resolve the ISO's operational concerns. Three stakeholders supported use of OMS to capture distribution-level charging constraints, at least as a near-term solution. Six stakeholders preferred updating resource modeling, with suggestions including exploring implementation of real-time telemetered capabilities and extending the dynamic limit tool. One stakeholder opposed extending the dynamic limit tool due to concerns it would be overly burdensome for scheduling coordinators. The ISO agrees that OMS can capture distribution-level charging constraints, but additional action may be needed to rapidly identify the resources that may face these constraints. The proper identification of such resources could materially aid operators during stressed system conditions. Such information could also supplement other conversations regarding the participation of these assets, particularly as it relates to resource adequacy.

### Guiding Principles for Problem Statement Development

The ISO needs transparency on distribution-level storage resource charging constraints, especially when these resources provide resource adequacy. Transparency will give operators awareness into potential real-time operational limitations on the distribution grid. The ISO believes identifying distribution-level storage resources in the Master File via flag would provide a good first step in providing transparency.

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The ISO is open to stakeholder feedback on whether other guiding principles need to be met or other potential resolutions.

### **4. Mixed-Fuel Resources**

#### **Co-located Resources: Background**

A co-located resource is a “Generating Unit with a unique Resource ID that is part of a Generating Facility with other Generating Units.”<sup>6</sup> Unlike hybrid resources, each generating unit has a unique resource ID, meaning metering, bids, telemetry requirements, constraints, and dispatch are all separate. Unlike stand-alone units, co-located generating units share a point of interconnection.

Prior to 2020,<sup>7</sup> the maximum normal capability of all co-located resources combined could not exceed the total interconnection rights. This policy design disincentivized co-located renewable resource development because intermittency was not factored in.

The Hybrid Resource initiative introduced the Aggregate Capability Constraint (ACC): a market constraint which ensures combined dispatch of all co-located resources does not exceed the point of interconnection limits, rather than limiting via maximum normal capability. Phase 2 of the initiative designed “sub-ACCs”, which allow three or more resources to be co-located at a single point of interconnection. With these enhancements, storage resources can more effectively co-locate with intermittent energy resources, increasing interconnection capacity factor by counterbalancing intermittent energy production. For example, a solar resource could simultaneously provide generation to the grid and charge a storage resource during the day. This storage resource could then discharge to the grid during the evening or overnight when the solar resource is not generating.

Co-located storage development can be incentivized by local, state, and federal tax credits. For example, prior to the Inflation Reduction Act (IRA), the federal investment tax credit (ITC) restricted eligibility to storage resources that charged at least 75% from co-located renewable resources.<sup>8</sup> The ISO’s supply mix is not 100% renewable, meaning co-located storage resources could risk tax credit eligibility if charging from the grid. In response to stakeholder request, the ISO introduced charging constraints in the Energy Storage Enhancements initiative, Phase 2. These constraints limit storage charging to the output of the co-located variable energy resource, helping resource operators comply with existing bilateral contracts and receive any tax benefits related to charging strictly from renewable resources.

Charging constraints apply to both day-ahead and real-time awards. In the day-ahead market, these charging constraints ensure storage day-ahead energy awards do not exceed their respective co-located renewable energy awards. In real-time, these constraints allow storage resources to deviate down from

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<sup>6</sup> California ISO Tariff, Appendix A.

<sup>7</sup> In reply to *California Independent System Operator Corp.*, 173 FERC ¶ 61,146 at 1.

<sup>8</sup> McLaren et al., “Battery Energy Storage Market: Commercial Scale, Lithium-ion Projects in the U.S.” at 14.



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real-time dispatch if actual schedules for their co-located renewable energy do not meet the prior forecast. Charging constraints are a biddable hourly parameter which is tracked by the Off-Grid Charging Indicator (OGCI) value. As of May 23, 2025, 2464 MW (41%) of participating co-located battery capacity could restrict grid charging via bids. 254 MW (4%) of participating co-located battery capacity restricted grid charging at all times.

Storage resources that receive regulation awards will automatically override the charging constraint. Regulation awards are crucial for reliability and maintaining a stable system frequency. Any constraint, including the charging constraints, which may impact real-time regulation award usage may be a reliability risk, and are overridden by design. Similarly, storage resources that elect to use Regulation Energy Management (REM) to focus on providing regulation cannot enact charging constraints. The ISO also reserves the right to exceptionally dispatch the resource in order to address eligible conditions, including reliability concerns. The ISO remains committed to maintaining functionality of this tool.

### **Hybrids Resources: Background**

Hybrid resources are defined as “a mixed fuel Resource with a single Resource ID at a single Point of Interconnection.” This definition was specified in the Hybrid Initiative Phase 1 tariff revisions<sup>9</sup> accepted by FERC on Nov. 19, 2020.<sup>10</sup> These definitions were the first FERC-approved tariff definitions for co-located hybrid or integrated hybrid resources<sup>11</sup>. Hybrid resources often combine storage components with a form of generation to make one resource in the eyes of the ISO: metering, telemetry requirements (for each component),<sup>12</sup> constraints, and point of interconnection are shared. Each component of a hybrid resource must independently meet minimum sizing requirements: 500 kW for any generation component and 100 kW for any storage component.

Hybrid resources can provide significant benefits to the electricity grid. According to FERC analysis, hybrid resources “can allow intermittent or duration-limited resources to achieve a higher combined capacity factor, facilitate more efficient transmission system operation by reducing congestion and curtailment in areas with high penetrations of intermittent resources, and provide transmission providers with more controllable ancillary services than standalone intermittent resources.”<sup>13</sup>

Hybrid resource development and operation can be incentivized by local, state, and federal tax credits. For example, prior to the Inflation Reduction Act (IRA), the federal investment tax credit (ITC) restricted eligibility to storage resources that charged at least 75% from co-located renewable resources.<sup>14</sup> The ISO’s supply mix is not 100% renewable. Through dynamic limits, bidding tools, and modeling parameters, hybrid resources can ensure that their storage components only charge from their

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<sup>9</sup> CAISO, “Hybrid Resources Initiative – Phase 1 Draft Tariff Language”, at 4.

<sup>10</sup> In reply to *California Independent System Operator Corp.*, 173 FERC ¶ 61,146 at 1.

<sup>11</sup> FERC, “Hybrid Resources White Paper”, May 2021, at 18.

<sup>12</sup> Hybrid resources split telemetry via VER UPMW and BESS MW. These values are plant output and do not include ancillary services dispatch of the hybrid resource

<sup>13</sup> FERC, “Hybrid Resources White Paper”, May 2021, at 22.

<sup>14</sup> McLaren et al., “Battery Energy Storage Market: Commercial Scale, Lithium-ion Projects in the U.S.” at 14.

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generation component. Thus, resource operators can comply with existing bilateral contracts and receive any tax benefits related to not charging from the grid.

In response to interest in hybrid resources from interconnection stakeholders, the ISO developed a Hybrid Resources Technical Bulletin in 2016. This bulletin provided the initial guidance on how existing rules could apply to hybrid resources. In 2019, the ISO launched the Hybrid Resources initiative to “identify potential new or enhanced market rules and business processes needed to accommodate the unique attributes of hybrid resources.”<sup>15</sup> This initiative was divided into two phases. Phase 1 defined a hybrid resource and required eligible intermittent resource components provide metrological data, like non-hybrid eligible intermittent resources. Phase 2 defined roles and responsibilities, introduced dynamic limit functionality, and clarified resource adequacy rules for hybrid resources. The Phase 2 proposed tariff changes were accepted by FERC November 30, 2021.

Within the Storage Design and Modeling initiative, the ISO scoped consideration for a hybrid resource default energy bid (DEB). Through verbal and written comments, stakeholders requested a review of hybrid resource elements and shared additional topics for consideration. This section will provide an overview of the dynamic limit tool, the high sustainable limit, and market power mitigation in preparation for problem statement development.

### **Co-located and Hybrid Resources: High Sustainable Limit**

Co-located and hybrid resources receive frequent dispatch instructions, impacting traditional telemetry provided to the CAISO. The high sustainable limit (HSL) estimates the maximum generating capacity of a variable energy resource for both co-located and hybrid resources. For example, a hybrid resource made up of solar and battery components has an HSL value that tracks the potential generation of the solar resource. Importantly, the HSL is not impacted by discharging or charging by the battery component. The HSL is not impacted by supplemental dispatches, operating instructions, ancillary services, or losses. This design allows for a protected source of weather-based telemetry data for the ISO to use in forecasting without market dispatches. This instantaneous measure is updated through generator telemetry at a minimum every 12 seconds.<sup>16</sup>

For co-located resources, the ISO needs the HSL for persistence-based forecasting. This methodology estimates weather’s impact to generation in the most recent MW telemetry. This estimate is heavily weighted in forecasting the next interval, as the same weather persists into the next interval. Persistence forecasting reduces the time between when the ISO receives telemetry data and when the ISO can include telemetry in the forecast. This reduction in lag enables more accurate short-term forecasting of VER production.

The ISO first publicly identified a need for the HSL in the Straw Proposal for the Hybrid Resources initiative issued October 19, 2020.<sup>17</sup> Under the “plant potential” terminology, the ISO stated the HSL is

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<sup>15</sup> CAISO, “Hybrid Resources Second Revised Straw Proposal”, April 2020, at 3.

<sup>16</sup> BPM for Direct Telemetry § 14.1.15

<sup>17</sup> CAISO, “Hybrid Resources Straw Proposal”, September 2019, at 21.

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needed for hybrid resources, so the ISO sees the potential output of the VER component. The HSL also helps the ISO ensure ancillary service awards to hybrid resources will be deliverable. More information on HSL use and requirements are available in the [HSL FAQ](#).

### **Guiding Principles for Problem Statement Development**

Currently, co-located VERs and VER components of hybrid resources are required to provide HSL per the tariff. The ISO has observed a variety of challenges in receiving accurate and reliable HSL values from resources. Because of these challenges, the ISO cannot use persistence-based forecasting for co-located resources, which would improve the accuracy of very-short term forecasts. Therefore, the ISO seeks ways to ensure high-quality HSL data reporting from mixed-fuel resources. For example, the ISO believes this challenge could be addressed through direct guidance on HSL formulation in the BPM.

### **Hybrid Resources: Dynamic Limits**

Hybrid resources are seen, dispatched, and modeled as one resource by the ISO. Any optimization between hybrid components, such as the state of charge of the storage component, is completed by the resource operator. However, hybrid resources are subject to the same dispatch responsibilities and market principles as other resources. The ISO must know the capabilities and limitations of the hybrid resource in order to ensure optimized and feasible market dispatch of the combined resource. Dynamic limits are used to restrain market dispatch accordingly using data submitted by scheduling coordinators.

Market awards are cleared based on schedules and bids submitted in the real-time market 75 minutes prior to the operating hour. Hybrid resources may face significant differences between what is feasible 75 minutes prior to the operating hour and real-time dispatch. Dynamic limits reduce operational uncertainty risk between bids and real-time feasibility by restricting the economic window for dispatch instructions per scheduling coordinator input on hybrid resource availability. Dynamic limits are updated every five minutes for the following rolling six-hour window and may be submitted up to 10 minutes before the associated real-time dispatch (RTD) market interval. Dynamic limits submissions are based on data provided by scheduling coordinators to reflect four different common scenarios: 1) ambient unavailability, 2) unavailability of renewable generation due to lack of fuel resource, 3) unavailability due to state of charge, or 4) to reflect onsite charging. Any other reason for generator derate must be submitted as an outage via the Outage Management System (OMS).<sup>18</sup>

Scheduling coordinators are required to submit updated data for dynamic limits for every 5-minute interval. If the SC fails to comply, they must notify the ISO as soon as possible to avoid unit deviation and potential system reliability issues. The Scheduling and Infrastructure and Business Rules system (SIBR) will automatically insert limits equal to the upper and lower economic limits if data is not submitted. With dynamic conditions, this stop-gap measure may lead to infeasible dispatch of hybrid resources.

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<sup>18</sup> BPM for Market Operations § 2.1.21.1

## Stakeholder Feedback

Three stakeholders provided comments regarding hybrid modeling and the dynamic limit tool. Some stakeholders have suggested methods to facilitate hybrid battery component regulation market participation. Two stakeholders believed that the ISO should discuss allowing for SOC management as an appropriate application for hybrid dynamic limits, especially given prior Hybrid Resource initiative policy development conversations in 2020. Two stakeholders also sought clarity on whether dynamic limits reflect hybrid resources' economic limits or operational limits.

Dynamic limits account for both economic and operational capabilities. The tariff states "Hybrid Resources will submit Hybrid Dynamic Limits representing Hybrid Resources' upper economic and lower economic limit [...]" The tariff also states dynamic limits "should reflect resource availability based on operating capabilities such as State of Charge and forecasted output from the variable component of Hybrid Resources. Scheduling Coordinators may also use Hybrid Dynamic Limits to manage onsite charging of an energy storage component of a Hybrid Resource."<sup>19</sup>

Additionally, Section 2.1.21.1 of the Market Operations BPM specifies "for every interval in which the hybrid resource has an economic bid, self-schedule, or a base schedule, the SC must submit a dynamic limit reflecting the hybrid resource's current operational capabilities to comply with Section 30.5.6.2 of the CAISO tariff."<sup>20</sup> The BPM refers to Section 30.5.6.2 of the tariff for further information. Section 30.5.6.2 states that the dynamic limit tool requires upper and lower economic limits.

One stakeholder suggested adding dynamic limit functionality to the ISO's automated generation control (AGS) system. This extension would automatically signal hybrid resource ancillary service availability, reducing administrative burden from outage card submission and eliminating the approximately 45-minute lag required to process the outage card prior to initial ancillary service availability.

Another stakeholder suggested modifying the hybrid model to enable the regulation signal to be applied directly to the battery component, under conditions similar to batteries using the Regulation Energy Management (REM) model. Under the REM model, the storage resource elects to participate only in the ISO's regulation markets. This election allows the ISO to use the resource's full range for regulation.

## Guiding Principles for Problem Statement Development

The ISO seeks to promote operational certainty and reduce administrative burden around dynamic limits. The ISO reiterates that dynamic limit capacity representation must be in good faith. Any withholding of capacity for economic gain may be subject to FERC referral under Section 39 of the ISO tariff. The ISO looks forward to further discussions about dynamic limits with stakeholders, including current functionality, potential opportunities for extension, clarifying usage for state-of-charge

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<sup>19</sup> California ISO Tariff § 30.5.6.2

<sup>20</sup> BPM for Market Operations § 2.1.21.1

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management, signaling ancillary services availability, for market power mitigation, or for other situations.

### **Hybrid Resources: Market Power Mitigation and Default Energy Bids**

Through market power mitigation (MPM), the ISO intends to “mitigate the market effects of any conduct that would substantially distort competitive outcomes in the CAISO markets while avoiding unnecessary interference with competitive price signals.” Additionally, the ISO monitors its markets for abuses of market power and reports any identified cases to FERC. These reports also include proposed mitigation measures and related justification.<sup>21</sup>

As outlined in Tariff Section 39, four categories of conduct may lead to mitigation: physical withholding (when an entities does not offer to sell or schedule generation that is capable of providing), Economic withholding (when an entities submits unjustifiably high bids such that generation will not be dispatched or artificially raises the locational marginal price), uneconomic overproduction in order to bind and benefit from a transmission constraint, or bidding practices that distort prices or uplift from those in a competitive market.

When the market detects conditions for potential market power, the ISO mitigates market power by capping bids at the resource-specific Default Energy Bid (DEB). The ISO intends DEBs to approximate the marginal costs a resource may face in providing generation.

In the final proposal for the Hybrid Resources initiative, the ISO committed to monitoring all hybrid resource forecasts and bids for strategic behavior.<sup>22</sup> Like all resources participating in ISO markets, hybrid resources are required to bid their full capacity, even if their maximum bid capacity is variable due to intermittency and charging capabilities. High sustainable limit (HSL), bid, and outage data help the ISO to determine whether conditions for exercising market power exist. However, the ISO opted to not implement market power mitigation for hybrid resources nor design a DEB at the time, stating that this topic would likely be addressed in a hybrid resources initiative follow-up.

### **Stakeholder comments**

Via comments due December 11, 2024, and February 20, 2025, eight stakeholders provided feedback on developing a default energy bid for hybrid resources. Two stakeholders supported using the storage DEB as a proxy for hybrid resources with a storage component in the near-term. Three additional stakeholders supported discussing the topic further, with one stakeholder supporting addressing hybrid DEBs after other initiative topics. Three stakeholders stated that the hybrid DEB should allow for bidding above the soft offer cap, following the ISO’s soft offer bid cap changes last year. One stakeholder also strongly recommended discussing dynamic limits in coordination with any effort to develop a hybrid resource DEB formulation or apply mitigation measures to hybrid resources. This stakeholder further noted that using dynamic limits for SOC considerations should also be taken into

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<sup>21</sup> California ISO Tariff § 39.1 – 39.3.1

<sup>22</sup> CAISO, “Hybrid Resources Final Proposal”, October 2020, at 18.

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consideration when developing the hybrid DEB. Two stakeholders expressed interest in the topic with no stated stances.

### **Guiding Principles for Problem Statement Development**

Without a hybrid DEB, the ISO cannot subject hybrid resources to market power mitigation, nor can hybrid resources bid above the soft offer cap. The ISO seeks to develop a fair hybrid DEB, given underlying component characteristics and cost structures. The ISO believes a hybrid DEB must holistically consider unique hybrid resource aspects, like the high sustainable limit and dynamic limits. The ISO also believes that the hybrid DEB and storage DEB initiative topics are separate yet interrelated conversations and will monitor if feedback in one conversation also applies to the other. The ISO appreciates feedback and is open to stakeholders sharing additional guiding principles on this topic.

## **5. Next Steps**

The ISO will host a virtual stakeholder call for the Storage Design and Modeling initiative on June 30, 2025, from 9:00pm to 4:00pm (PST) to discuss, in part, the Discussion Paper on Mixed-Fuel and Distribution-Level Resources. Attendees may choose to participate virtually or provide written comments based on the meeting recording and discussion paper. Written comments on the discussion paper and meeting are due July 16, 2025.