



Demand and Distributed Energy Market Integration:
Track 1 Revised Straw Proposal

*End-Use Customer Exports in Demand Response
Performance Measurement*

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Executive Summary

The California Independent System Operator (ISO) is advancing Track 1 of its Demand and Distributed Energy Market Integration (DDEMI) initiative, proposing targeted reforms to demand response (DR) metering to better reflect behind-the-meter resource export capability. Building on stakeholder feedback, this revised straw proposal maintains the core approach of allowing limited recognition of utility-authorized export behavior at the end-use customer level, while maintaining wholesale DR as a load curtailment product at the resource level.

The proposal does not modify the fundamental definition of demand response as load curtailment. It limits unmodeled grid impacts and preserves existing deliverability frameworks. While the proposal applies broadly to market participants across all balancing authority areas (BAAs) participating in ISO markets, considerations related to Resource Adequacy (RA) eligibility and transmission deliverability treatment described here apply only within the ISO BAA; other BAAs may apply their own rules.

The changes apply to both ISO demand response market models, which are available to all market participants.¹ Although these models are currently used primarily within the ISO BAA, they may become more attractive for the ISO's Western Energy Imbalance Market (WEIM) and Extended Day Ahead Market (EDAM) entities, particularly as large loads seek to utilize nearby distributed resources as a "bring your own generation" option.

This proposal applies to all performance evaluation methodologies, and because baseline and event-period calculations incorporate typical behavior, it ensures that only incremental load curtailment—rather than embedded export behavior—is compensated. It also assigns Scheduling Coordinators (SCs) responsibility for applying the export limit in settlement-quality meter data and enables utility distribution company (UDC) review to verify that participating end-use customers have appropriate export interconnection approvals.

Overall, DDEMI Track 1 responds to increasing adoption of behind-the-meter storage and the need to more accurately reflect its operational capabilities in wholesale markets, while maintaining reliability and market efficiency.

¹ The Proxy Demand Resource (PDR) and Reliability Demand Response Resource (RDRR) models.

Background

In March 2026, the ISO began the policy development phase of the DDEMI initiative following a 2025 stakeholder working group process. The Track 1 straw proposal was focused on metering rules for DR resources in ISO markets. The ISO proposed removing the requirement that SCs set customer-load meter data to zero during export intervals, while introducing a resource level export limit. This proposal would only be available for utility retail customers that are already approved for export onto the distribution system. This approach keeps DR categorized as load curtailment, minimizes unintended grid impacts if there were to be export, coordinates with the distribution utility, and ensures other resources retain their deliverability.

This proposal was driven by the following DDEMI working group-developed problem statement:

“While PDR is the most compatible CAISO model for behind-the-meter interconnected storage, because it is conceptualized as load curtailment, it does not include any measured export of energy from individual locations to measure performance of the resource via any of existing PEMs—including metering generator output methodology—so that behind-the-meter storage aggregations cannot offer the full resource capability, and PDR performance is artificially capped at levels reflecting conservative estimates of site load, resulting in significant energy from behind-the-meter storage that is unused during events and unavailable to the CAISO market.”

This problem highlights a structural mismatch between behind-the-meter resource capabilities and the current DR measurement framework, which Track 1 seeks to address without redefining demand response.

ISO staff responded as a part of the final discussion paper with several comments related to market policy solutions that could be developed to address this problem, federal regulatory considerations, and a preliminary estimation of the difficulty of implementation of potential solutions. The ISO assessment for the behind-the-meter storage accounting problem statement is below:

- **Policy:** For an energy market solution to this problem, the reforms could be straightforward. Determining deliverability under a reformed PDR model that addresses this problem may require additional analysis and policy development efforts

- **Regulatory:** This highlights a “problem” that may be out of scope of the demand response/load curtailment model, but with certain considerations, could be scoped appropriately
- **Implementation:** For energy market solution, relatively low implementation difficulty

Stakeholder Feedback: DDEMI Track 1 Straw Proposal

In March 2026, when the ISO issued the Track 1 straw proposal related to demand response metering rules, stakeholders provided a variety of feedback and suggested changes. Stakeholders generally agree that the current prohibition on recognizing exports at the end-use customer level is a key limitation in the ISO’s demand response metering framework. Stakeholders support near-term reforms, though views differ on scope and some specific details around safeguards. Overall, stakeholders agree on the need to better reflect behind-the-meter exports, but diverge on how to do so without undermining the existing frameworks.

A large majority of stakeholders supported the Track 1 proposal to remove the requirement that SCs “zero out” exports that are already occurring at the end-use customer level. These supportive stakeholders included Advanced Energy United, CalCCA, CEDMC, CLECA, CPower, Enchanted Rock, Leap, MCE, PG&E, SEIA, Sunrun, Tesla, and Vote Solar. These stakeholders emphasized that current rules understate the capabilities of behind-the-meter resources, particularly storage, and that the proposal would harness additional energy and improve price formation. Many of these stakeholders also characterized the change as a relatively simple metering accounting revision that should be implemented quickly.

Some stakeholders wanted the proposal to go further. Advanced Energy United, CEDMC, Leap, and CalSSA urged the ISO to consider expanding the proposal over time to allow netting at broader aggregation levels (e.g., sub-LAP), including enabling aggregators to combine exporting and non-exporting end-use customers to optimize net export capability. Similarly, Sunrun and Tesla argued the proposed aggregation-level “zero floor” is overly restrictive and may limit the practical value of the reform. However, most stakeholders did not want these enhancements to delay near-term implementation.

In contrast, SCE and SDG&E raised several significant concerns. SCE opposed the Track 1 proposal, arguing it would undermine the load-curtailment construct of wholesale demand response and introduce unresolved risks of double compensation

between wholesale market payments and retail tariffs. SDG&E did not oppose the proposal outright, but raised similar concerns as SCE regarding the integrity of performance evaluation methodologies, cost impacts due to UDC review, and incentives for potential gaming. SDG&E recommended limiting the reform to apply to the metering generator output (MGO) methodology only, if Track 1 is pursued further.

The California Public Utilities Commission (CPUC) Energy Division staff did not oppose the Track 1 proposal and supported removing restrictions on exports for end-use customers already authorized to export and extending the approach to performance evaluation methodologies (PEMs) that can responsibly incorporate exporting resources. They did, however, emphasize that strong safeguards must be in place to prevent double compensation between wholesale and retail DR programs, consistent with existing prohibitions on including Net Energy Metering (NEM), and its successor Net Billing Tariff (NBT), for certain participation pathways. Energy Division staff highlighted the need for ongoing coordination between ISO and CPUC efforts, noting that implementation may depend on a parallel update to the underlying programs that participate in PDR which impacts CPUC rules, retail tariffs, and program implementation considerations. Energy Division staff also raised additional considerations largely absent from other comments, including the potential for unintended load shifting effects (i.e., high demand during hours adjacent to DR events). Finally, Energy Division staff flagged potential differences in how utilities and third-party DR providers allocate DR value to customers, suggesting equity and regulatory considerations may need further attention. Overall, Energy Division staff's comments indicate that while the proposal is directionally acceptable, its success depends on careful coordination, implementation design, and safeguards beyond the ISO's immediate scope.

Across stakeholders, there was broad support for applying the proposed metering reform across all PEMs, rather than solely limiting it to the MGO methodology, given that most DR resources rely on non-MGO PEMs today. However, SDG&E supported limiting the change to MGO, and SCE opposed applying it to any PEM.

Stakeholders generally supported allowing DR providers to determine how export value is allocated across customers during the SQMD development process, though some, including CPUC Energy Division and utilities, raised concerns about equity and incentives. This reflects current rules, wherein Demand Response Providers (DRP) and their SCs are responsible for calculating settlement quality meter data themselves. There was also broad agreement that end-use customers whose exports are reflected must have approved distribution export interconnection agreements (i.e., Rule 21 export

interconnection), though some of the UDCs noted additional implementation challenges related to UDC review processes, metering, and system impacts.

The California ISO Department of Market Monitoring (DMM) supports improved DR modeling and acknowledges approved exports, but warned that rules must prevent generators from using DR pathways to bypass interconnection review, system studies, and cost responsibilities. They also suggested ISO and stakeholders work to ensure development in Track 1 improve DR availability and performance when allowing end-use customers to export.

Some stakeholders also encouraged coordination with the CPUC to develop a framework for recognizing export capability in RA counting, though this was not universally supported. Finally, many stakeholders emphasized that Track 1 should be viewed as an incremental step. Several, including CPUC Energy Division, PG&E, and Tesla, highlighted the importance of resolving broader issues such as retail-wholesale coordination, RA treatment, and device-level measurement and visibility through continued collaboration between the ISO and CPUC.

Track 1 Revised Straw Proposal

The ISO proposes maintaining the central tenets of the straw proposal, but this revised straw proposal provides some additional specificity or clarity in key areas left undetermined in the straw proposal:

- Explicit clarification that this applies to both PDR and RDRR
- Performance evaluation methodology application
- Double compensation
- Resource level export limit
- UDC review and export interconnection
- SC role in applying export limits

PEM Application

Under the ISO's participation models, the DRP submits additional performance data to support the SC's participation in the wholesale markets on behalf of the end-use customers within the aggregation. There is already a practice today of zeroing out exporting intervals when DRPs use the MGO PEM.² This proposal extends consistent treatment across all PEMs, including day matching, weather matching, control group, MGO, and any other applicable approaches.

The ISO proposes to apply this framework uniformly to all PEMs. Regardless of the methodology used, the resource level export limit will apply. The ISO does not differentiate across PEM types for purposes of this proposal, as the focus is on accurately accounting for customer behavior during DR dispatch intervals.

Capturing export behavior is not just important during demand response dispatch events, but also important to capture to the extent it represents typical behavior. To ensure consistency and accurate compensation, baseline calculations must also reflect regular export behavior during non-event intervals. Capturing both export behavior during dispatch and typical export patterns outside of events ensures that compensation reflects incremental wholesale demand response service above typical behavior.

New Export Limit

Definition of Demand Response

Per the ISO tariff definitions for PDR and RDRR,³ these participation models are designed exclusively as load curtailment resources. This aggregation, registered in the ISO's market models as either PDR or RDRR, is comprised of individual end-use customers that, combined, provide the wholesale demand response service through the ISO's markets. This means that a DR resource may reduce only the load of the aggregated customers registered as a part of the aggregated wholesale resource, limited to the amount of load of those registered customers during PDR or RDRR dispatch. Once the aggregated customers registered as a part of a DR resource have no remaining load to curtail, the resource cannot provide additional curtailment, as the wholesale resource may not receive credit for amounts above the curtailable load of the

² ISO Tariff Section 4.13.4.2 (a) and (d)

³ ISO Tariff Section 4.13.5

aggregation. The maximum curtailment capability for the wholesale PDR/RDRR resource is therefore limited to the amount of the participants' own aggregated site loads. The PDR/RDRR wholesale curtailment instruction cannot exceed that amount without violating assumptions based on these resources being, by definition, load-curtailment-as-generation. Unlike Distributed Energy Resource Aggregations (DERA), PDR/RDRR resources are not designed to function directly as generation resources.

If an entity wishes to participate as a generating resource (*i.e.*, provide net positive output to the grid under a market resource ID) there is a well-established process for doing so. The entity must enter the appropriate generation interconnection queue. For distribution interconnections, this could be a wholesale distribution access tariff interconnection. For transmission interconnections, the interconnection process for ISO or another BAA within the ISO market footprint is the appropriate path. The ISO tariff does not provide a mechanism for exporting PDRs or RDRRs. Even if the ISO created a new category, it would still require following the applicable generator interconnection.

The DERA model, the ISO's FERC Order 2222-compliant model, is a natural fit for aggregated DERs seeking to participate in ISO markets in a more equivalent manner to a generating resource that exports energy beyond the load curtailment amount.

ISO BAA Deliverability

The following discussion applies specifically to the ISO BAA and does not establish requirements for other BAAs participating in ISO-administered markets.

Resources in the ISO BAA may request and, subject to the interconnection and study process, obtain deliverability status as part of interconnection. While this section's discussion is grounded in the ISO's role as the balancing authority and transmission operator, and therefore reflects how these issues are addressed within the ISO BAA/TOP, it is not intended to establish or imply requirements for the broader market footprint beyond this operational context. Any matters that overlap with interconnection processes, including those associated with DDEMI Track 1, remain subject to each BAA's jurisdiction.

The purpose of the ISO deliverability assessment is to demonstrate that the generating capacity in any electrical area can be run simultaneously, at peak load, and that the excess energy above load in that electrical area can be exported to the remainder of the control area, subject to contingency testing.

The ISO BAA is not moving forward with stakeholder proposals to allow exports from each individual market ID, up to total load of the sub-lap or beyond their own sub-lap load, as it could take deliverability away from other resources. The ISO defers to other BAAs if they choose to take a different approach. Deliverability is finite and shared in the ISO BAA. In the ISO BAA deliverability study context, general load is already used to support deliverability for existing full and partial capacity resources. Exports beyond a resource's own registered load would rely on that same general load and could therefore reduce deliverability available to other resources.

In other words, exports beyond the DR resource can take deliverability away that was already granted to other resources. Therefore, if a DR resource wishes to rely on this general load (not already included under its own market ID) to support resource level generation export capabilities, it must proceed through the generator interconnection queue and obtain the appropriate transmission planning deliverability (TPD) allocations in the same manner that all other transmission and distribution interconnected exporting resources do. PDRs and RDRRs may use only their own customers' load to support their curtailment capability—now and in the future.

The ISO BAA keeps DR defined as load curtailment at the aggregation level due to limited visibility into individual end-use customer load. If individual customer data were available, curtailment would be assessed at that level instead. For PDRs, this would limit the customer-level dispatch to curtailment-only, no exports. This approach reinforces that individual exports are not intended to count toward RA without a TPD allocation. The limited export behavior reflected in this proposal does not represent a policy shift, but rather a practical outcome of aggregation, where the ISO cannot distinguish between individual customers within a market resource ID. With greater visibility, exporting customers would instead be treated as Energy-Only resources and would not be RA-eligible absent a TPD allocation.

Historically, DR resources received full capacity deliverability status (FCDS) through a 2005 grandfathering policy, but only for curtailment capability and at levels existing at that time. Because the amounts of PDRs and RDRRs in the ISO BAA today are about the same as in 2005, all DR resources continue to hold FCDS. As such, the ISO gave PDRs an effective deliverability waiver, maintaining them all as FCDS. Existing assumed FCDS for PDRs and RDRRs applies only to load curtailment capability, and only to the levels that existed in 2005 for all load curtailment programs. If DR resource capacity were to grow by a material amount, the ISO may need to consider a new process for allocation of deliverability to DR resources similar to the TPD allocation process.

The original 2005 deliverability status grandfathering does not apply to exporting DR resources. If the definition of demand response were to be modified to include “negative curtailment” (exporting) at the resource level, the ISO must queue and model such exporting demand response in order to include them in deliverability studies, allocate their own TPD and assure they have no negative impact on the deliverability of other existing FCDS and PCDS resources or already queued resources with existing TPD allocations.

Proposal

The ISO proposes to retain the existing wholesale demand response construct while refining the measurement practices used to evaluate the amount of demand response provided within resource aggregations. At the resource level, demand response resources cannot produce net export in any interval. Under such a limit, SCs would be required to replace the *aggregated* customer load meter data with a zero value for any interval where that meter data is negative. This approach removes the existing restriction preventing the aggregation from measuring exports at the end-use customer level when those customers are authorized under their interconnection agreements to export energy. This maintains the existing definition of demand response as a load curtailment product while more accurately measuring additional usable capability. This change does not authorize exports as a demand response product, but rather refines how existing end-use customer behavior is measured within aggregated resources.

Utility Distribution Company Interconnection Review

Today, through the ISO's Demand Response Registration System (DRRS), UDCs review and approve or reject location registrations submitted by DRPs for customers participating in an ISO demand response resource. The registration system serves several purposes, including preventing participation in multiple overlapping or conflicting demand response programs. UDC review of each location also enables the distribution utility to ensure that a customer's participation in an ISO demand response program does not jeopardize the UDC's ability to safely and reliably operate the distribution system. Stakeholders broadly agreed that customers whose exports would be counted in demand response energy measurement should have an approved interconnection agreement that allows exports. For CPUC-jurisdictional utilities, a Rule 21 export distribution interconnection qualifies as such an agreement.

The ISO proposes an enhancement to the UDC review process for registering customer locations as part of a demand response resource. Today, UDC review is conducted through DRRS. The goal of the enhanced process is to ensure that DRPs identify each

customer service account they intend to include in demand response energy measurement calculations that would reflect end-use customer-level exports. To support this, the ISO will introduce a new attribute in DRRS to identify customer accounts whose exports are intended to be included in performance measurement. This enhancement will enable utilities to review and confirm the interconnection status of each customer account.

Scheduling Coordinator Role in Applying Export Limits

While this proposal introduces a new rule replacing any intervals where *aggregated* customer meter data during a DR dispatch period is negative (exporting) with zero values, it does not specify *which* individual exporting end-use customers during these intervals should be zeroed out. Ultimately, the SC, not the DRP, is responsible for calculating and submitting aggregated meter data as resource meter data for settlement purposes. The ISO proposes that SCs apply the resource level export limit as a part of their meter data calculations, based on clear stakeholder feedback in support of allowing the SC to make this determination.

Governing Body Classification

This initiative will update how demand response is measured when the demand response is participating in the markets operated by the ISO. This includes enhancements to PDR export rules and settlement methodologies. Because these market rule changes would apply to WEIM/EDAM Entity balancing authority areas, rather than solely the ISO balancing authority area, they fall under the WEM Governing Body's primary authority.

The WEM Governing Body has primary authority over any:

proposal to change or establish a tariff rule applicable to the WEIM/EDAM Entity balancing authority areas, WEIM/EDAM Entities, or other market participants within the WEIM/EDAM Entity balancing authority areas, in their capacity as participants in WEIM/EDAM... The scope of this primary authority excludes, without limitation, any other proposals to change or establish tariff rule(s) applicable only to the ISO balancing authority area or to the ISO-controlled grid. Charter for WEIM and EDAM Governance § 2.2.1. The proposed tariff changes would be “applicable to WEIM/EDAM Entity balancing authority areas, WEIM/EDAM Entities, or other market participants within WEIM/EDAM Entity balancing authority areas, in their capacity as participants in WEIM/EDAM.”

The changes proposed in Track 1 will not be limited to the ISO balancing authority area or to the ISO-controlled grid. Accordingly, the proposed changes fall within the scope of the WEM Governing Body's primary authority.

Next Steps

The ISO seeks stakeholder input on a set of targeted metering changes and broader market participation options designed to expand demand flexibility across the Western market footprint. Stakeholder feedback on this revised straw proposal will inform the development of a draft final proposal for Track 1.

The ISO plans to host a hybrid stakeholder meeting to discuss this revised straw proposal on June 18, 2026. Comments on this revised straw proposal are due to the ISO on July 2, 2026.