Memorandum

To: ISO Board of Governors

From: Keith Casey, Vice President, Market & Infrastructure Development

Date: July 19, 2017

Re: **Decision on the energy storage and distributed energy resources phase 2 (ESDER 2) proposal**

This memorandum requires Board action.

EXECUTIVE SUMMARY

Management continues its efforts to lower barriers and enhance the ability of distributed energy resources and transmission grid-connected energy storage to participate in the ISO market through this second phase of the energy storage and distributed energy resources (ESDER) initiative.

ESDER is an on-going omnibus initiative that covers distinct topics related to demand response, non-generator resources, storage resources, and distributed energy resource (DER) multi-use applications. The current second phase of this initiative (ESDER2) addressed multiple topics. Management proposes the following three items for Board approval:

1) Provide three new types of demand response performance evaluation methods. (decision)
2) Clarification of station power treatment for storage resources. (decision)
3) Incorporating additional gas indices into the net benefits test calculation to reflect all real-time participation regions. (Approved by the EIM Governing Body, and on the Board's July 26, 2017 consent agenda)

The first of ESDER 2's three proposals enhances the proxy demand resource (PDR) and reliability demand response resource (RDRR) market participation models by providing demand response providers with three additional types of performance evaluation methods to best reflect the performance of different types and configurations of demand response. Currently, the tariff only provides a day-matching customer load baseline performance evaluation methodology, which must cover all demand response configurations from industrial to residential. Stakeholders have voiced repeatedly that this one day-matching

baseline methodology is not robust enough to accurately assess the performance of all demand types and configurations. To remedy this, Management proposes to offer three new classes of baseline performance evaluation methodologies including a control group methodology, a weather matching methodology, and an additional day-matching methodology baselines applicable to retail customer segments. The EIM governing body, at its July 13 meeting, voted to provide an advisory opinion in support of this proposal.

The second of ESDER 2's three proposals provides regulatory certainty for storage resources regarding station power, which is the retail energy used onsite to produce energy. Stakeholders were concerned that the ISO tariff and retail tariffs could define wholesale charging functions and retail station power functions differently, which would lead to conflicting rules and settlements. Because the question of what constitutes station power is in the retail jurisdiction, Management determined its station power proposal should simplify the ISO's station power tariff definition and defer to the station power rules as applied by the relevant local regulatory authority. The ISO will incorporate wholesale charging examples in the ISO Business Practice Manual and will ensure the storage resource developer attests to complying with the relevant local regulatory authority's station power requirements within the ISO's new resource implementation process. The EIM governing body, at its July 13 meeting, voted to provide an advisory opinion in support of this proposal.

The third of ESDER 2's three proposals addresses the net benefits test. The ISO calculates a net benefits test price threshold to indicate when a decrease in demand from demand response provides a net benefit to all purchasers in terms of a wholesale market price reduction. The net benefits test price threshold is used by the ISO to determine when an adjustment is required to the settlement of the load serving entity who procured the load the demand response resource curtailed.

Every month, the ISO estimates the price at which the net benefit is triggered. Management's proposal in ESDER 2 simply removes existing tariff language that ties certain gas price indices to the derivation of the net benefits test price threshold. Management proposes to incorporate *all* relevant gas price indices used to derive the net benefits test price threshold into the ISO's Business Practice Manual for Market Instruments. The reason for this requested change is as new Energy Imbalance Market participants are added to the real-time market, the net benefits test price threshold calculation should incorporate a greater number of gas price indices to reflect participation that occurs across the expanded real-time market footprint. Adding additional gas price indices through the business practice manual process versus through subsequent and repeated tariff amendments each time a new participant joins the ISO provides the flexibility needed to easily add new gas price indices used to calculate the net benefits test price threshold. This third proposal of ESDER 2 has been approved by the EIM Governing body at its July 13 meeting, as an exercise of its primary authority, and is thus on the ISO Board's July 26 consent agenda.

Management proposes the following motion:

> ***Moved, that the ISO Board of Governors approves the* energy storage and distributed energy resources phase 2 *proposal, as described in the memorandum dated July 19, 2017; and***
>
> ***Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.***

DISCUSSION AND ANALYSIS

Below is an overview of the three proposals prepared by Management under the second phase of the ESDER initiative:

1) Proposed baseline methodology enhancements for PDRs and RDRRs

Currently, the ISO uses a day-matching customer load baseline performance evaluation method. The method consists of a "10-in-10" customer load baseline where the ISO evaluates each hour during the past 10 similar days to establish an average performance baseline. PDRs and RDRRs are then settled based on responses to dispatch above their baselines. While research has shown this day-matching baseline to be accurate for many medium and large commercial/industrial customers, research has also shown that this baseline may not perfectly capture the performance of smaller resources. A stakeholder-led Baseline Alternative Working Group (BAWG) was established within the ESDER2 initiative to identify additional performance evaluation methodology options.

The BAWG analyzed and proposed the three types of customer load baseline methodologies summarized below.

- Control Groups: Evaluates the energy consumption of a set of similar, but non-participating customers. The control group establishes the baseline of what load patterns would have been, absent the dispatch.

- Day Matching: Estimates what electricity use would have been in the absence of a dispatch, relying exclusively on the electricity-use data from the dispatched customers. The load patterns during a subset of non-event days are used to estimate the baseline for the dispatch day.

- Weather Matching: The load patterns with the most similar weather conditions during a subset of non-event days are used to estimate the baseline for the dispatch day.

For greater flexibility and timely baseline implementation, Management is proposing to have all baseline calculations, including the current 10-in-10 customer load baseline, performed and submitted by the resources' scheduling coordinators (SCs). Shifting this responsibility

to the SC accelerates the needed retirement of the legacy system currently calculating baselines, and it gives the SC access to the ISO's Market Results Interface-Settlements ("MRI-S") system to submit, view, export and upload data in batch files. The ISO believes this change will provide a more consistent and flexible approach to performance calculation management and data processing for demand response resource participation. To ensure the accurate development and submission of performance evaluation results, the ISO will leverage auditing provisions including the bi-annual SC self-audit and, on an as-needed basis, selective auditing by ISO staff.

2) Clarification of station power treatment for storage resources

Through the ESDER2 initiative, Management has worked toward resolving potential issues in distinguishing between wholesale charging energy and retail station power. In joint stakeholder workshops, the topic was examined in collaboration with the CPUC as part of the CPUC's energy storage proceeding (CPUC Rulemaking 15-03-011) and within ESDER 2. This joint CPUC-ISO effort recognized that re-defining station power from a wholesale perspective could be counter-productive if the CPUC makes different station power determinations from a retail perspective. The ISO's current station power tariff definition is prescriptive and lengthy and includes details specific to generation units that may not be relevant or exclude elements of station power for storage resources. But station power is inherently a retail issue, and therefore not defined by the ISO tariff or FERC. As such, the ISO's efforts to mirror retail rules in its wholesale tariff is imprudent and impractical. Therefore, Management proposes that the ISO's tariff be made consistent with retail tariffs by expressly deferring to the local regulatory authority on what constitutes station power.

This still leaves the question of how to separately account and settle for wholesale charging energy and retail station power, so Management also proposes to include a rule in the ISO's metering provisions stating that resources will ensure that they work with their retail energy provider (likely during interconnection) to ensure compliance with their local regulatory authority on this issue. Management views this as a prudent compliance measure because the retail energy provider is the entity incentivized and responsible for ensuring that its customers are not avoiding retail charges.

3) Proposal to incorporate additional gas indices into the net benefits test calculation and move gas indices from the tariff to Business Practice Manual

The demand response net benefits test was established by FERC in Order No. 745. It requires ISOs and RTOs to pay demand response resources the full locational marginal price, as if they were generating resources, without any offset or reduction to reflect avoided fuel costs. When the system price of energy exceeds a certain price threshold, FERC ruled the decrease in demand from demand response energy reductions provides a net benefit, i.e. a lower cost to all purchasers in the wholesale market.

The net benefits test price threshold is used by the ISO to determine when an adjustment is required to the settlement of the load serving entity who procured the load the demand response resource curtailed. If a demand response resource's energy reduction occurs

when the market clearing price is below the calculated net benefits test price threshold, then that load reduction is deemed not net beneficial to the market. When this occurs, the load-serving entity's uninstructed imbalance energy quantity is adjusted in settlements to avoid a non-beneficial settlement outcome. There is no adjustment to a load-serving entity's settlement when a demand response resource's energy reduction is paid at a price above the net benefits test price threshold since that energy reduction and the resulting settlement outcome is deemed net beneficial to the system.

The net benefits test price threshold is calculated each month by taking the aggregate supply curve from the same month of the previous year, adjusting the curve using updated fuel prices, and then calculating the price threshold where demand response net benefits occur. The existing tariff explicitly states that fuel prices used to update the monthly net benefits test price threshold are determined by using a simple average of the PG&E Citygate price and the Southern California Edison Company Citygate price.

Management and the Department of Market Monitoring ("DMM") identified a gap in the existing formulation of the net benefits test price threshold. The existing net benefits test price threshold is derived using only California-specific gas price indices, yet the real-time market has expanded beyond California. Management is therefore proposing to expand the gas price indices available for use in the calculation of the net benefits test price threshold to represent gas prices relevant to all real-time market bids. Management also is proposing to remove existing tariff language that ties specific gas price indices to the derivation of the net benefits test price threshold and, instead, incorporate all relevant gas price indices used into the ISO's Business Practice Manual for Market Instruments. Moving the gas price indices out of the tariff and into the business practice manual provides the ISO the flexibility needed to easily add new gas price indices to the net benefits test price threshold calculation as new participants join the energy imbalance market or the ISO. The EIM Governing body, exercising its primary authority at its July 13 meeting, approved this proposal for inclusion on the Board's July 26 consent agenda.

POSITIONS OF THE PARTIES

Stakeholder comments were generally supportive of ESDER 2's three proposals. Management addresses stakeholder comments in Attachment A.

CONCLUSION

Management requests the Board approve its proposals for the provision of three new types of demand response performance evaluation methods and to clarify station power treatment for storage resources. Management's first two proposals in ESDER 2 are presented for Board approval, with the EIM Governing Body's support in the form of an advisory opinion. Management's third ESDER 2 proposal, incorporating additional gas indices into the net benefits test calculation to reflect all real-time participation regions, was approved by the EIM Governing Body under its primary authority and is included on the Board's consent agenda.