

## Stakeholder Comments Template

Submitted by	Company	Date Submitted
Sebastien Csapo (415-973-7370) Alexandra Mackie (415-973-3367)	Pacific Gas & Electric	April 18, 2016

Please use this template to provide your comments on the ESDER Phase 2 stakeholder initiative Issue Paper posted on March 22 and as supplemented by the presentation and discussion during the stakeholder web conference held on April 4, 2016.

Submit comments to [InitiativeComments@CAISO.com](mailto:InitiativeComments@CAISO.com)

[Comments are due April 18, 2016 by 5:00pm](#)

### PG&E Comments:

PG&E appreciates the opportunity to comment on CAISO’s Energy Storage and Distributed Energy Resources (ESDER) Phase 2 Issue Paper.

PG&E particularly appreciates the CAISO’s proposal to address multiple-use application and station power issues in coordination with the CPUC, via the ongoing Energy Storage Order Instituting Rulemaking (OIR). In ESDER Phase 1, PG&E advocated for closer coordination to address overlap between CAISO initiatives and CPUC proceedings, and supports the CAISO’s plan to more closely align efforts at the respective organizations. PG&E is an active participant in the CPUC’s energy storage proceeding, and looks forward to collaborating with the CAISO, the CPUC and stakeholders in that venue.

PG&E agrees with the CAISO’s focus in Phase 2 on enhancements to the NGR model and to Demand Response models (PDR/RDRR). While the CAISO and stakeholders made considerable progress on both these topics, at the end of ESDER Phase 1 PG&E acknowledged that there was still work to do on state of charge enhancements in the NGR model, as well as the need to address double compensation in PDR/RDRR baseline design. PG&E hopes that stakeholders can make continued progress on these issues in Phase 2.

Regarding the CAISO’s proposal to review the rules for load subject to the transmission access charge (TAC), PG&E disagrees with the premise that TAC allocation should be reconsidered to

reflect the growth of distributed generation. However, if CAISO moves forward with a proposal on TAC, PG&E will participate in the stakeholder process to ensure that no proposal results in an unfair cost shift to PG&E's customers. While PG&E supports innovations and investments in grid infrastructure, planning, and operation that enable increased DER deployment, any design elements of a DER future must equitably allocate grid investment and operational costs to all customers based on cost causation. All stakeholders in the energy value chain should contribute their equitable share of the costs of the infrastructure required to serve them.

PG&E provides more detailed comments on each of the Phase 2 issues below.

### **NGR enhancements**

*The CAISO is proposing to explore two possible areas of NGR enhancement: (1) representing use limitations in the NGR model, and (2) representing multiple configurations in the NGR model.*

*The CAISO is requesting stakeholders provide comments and consider the following:*

- *Are these two possible areas of NGR enhancement the highest priority NGR enhancements to pursue in ESDER Phase 2?*
- *Are there other areas of NGR enhancement that are of higher priority that should be pursued instead? If yes, which ISO-proposed NGR enhancement should be omitted from the scope?*
- *Please provide examples of use cases that support the NGR enhancements you view are of the highest priority and should be pursued in ESDER Phase 2.*

### **PG&E Comments:**

PG&E agrees that use limitations are one of the highest priorities for ESDER Phase 2.

PG&E supports reflecting use limitations such as throughput and cycle limitations in the NGR model as optimization constraints. PG&E considers use limitations to be the highest priority for enhancements to the NGR model. Energy storage resources are inherently use limited. Contracting with energy storage resources requires a balance between offering greater flexibility and the economic constraints of degrading the resource's useful life and manufacturer warranties. It is impossible to separate these economic considerations from the structure of the contracts. Based on PG&E's experience with the 2014 Energy Storage RFO and conversations with storage manufacturers, many energy storage warranties specify annual discharge limitations in order to preserve the life of the battery for the full span of the warranty. Depending on the contract structure, these annual limitations may be a constraint that Scheduling Coordinators must manage. NGR enhancements that include daily limits on

throughput and cycling, along with the ability to change these limitations on a day-to-day basis, would give Scheduling Coordinators the means to effectively manage these constraints. Representing transition time use limitations, while a lower priority than throughput and cycle limitations, would also provide Scheduling Coordinators with the ability to better balance physical limitations and market needs. Not all physical capability of an energy storage resource can be unlocked with an opportunity cost adder without harming the resource's useful life. With 580 MW of mandated procurement coming online in PG&E's system alone, PG&E recommends that while market participants gain operational experience from energy storage resources, CAISO should prioritize incorporating use limitations into the NGR model.

Allowing a user-specified Regulation Energy Management (REM) operating range is a higher priority to PG&E than representing multiple configurations in the NGR model. Accordingly, PG&E recommends CAISO pursue the user-specific REM operating range instead.

For PG&E, an enhancement that represents multiple configurations in the NGR model is not a high priority, particularly in comparison to representing use limitations in the NGR model. PG&E recommends enhancements to allow for a user-specified REM operating range as a higher priority than representing multiple configurations.

PG&E's testing of the NGR model with its Vaca-Dixon and Yerba Buena Battery Energy Storage Systems (BESS) has found that CAISO does an excellent job managing the state of charge (SOC) of a resource on REM. CAISO manages the SOC at 50%. While this may be an ideal solution for a fully dedicated CAISO REM resource, this approach is not suitable in situations when a portion of the resource is dedicated for another purpose. For example, half of PG&E's Yerba Buena BESS (4 MW) is dedicated to the customer's on site usage and the other half is market participating. To ideally operate on REM, this resource would have a REM operating range of 2 MW managed at a median state of charge of 75%, as operating at median state of charge of 50% violates the terms with the on-site customer. PG&E anticipates other resources may also face a similar situation, with a portion of capacity dedicated to on site usage and a portion devoted to CAISO wholesale market participation.

To highlight the impact a user-specified REM operating range enhancement could make, to-date PG&E has found that resources operating on REM have generated most of the market value of a battery storage system. To unlock the full value of energy storage, in cases where a resource may have a dedicated use for energy storage, CAISO should consider allowing a resource to specify the REM operating range. As an example, for PG&E's Vaca-Dixon resource from 8/1/15 through 8/31/15, 68% of the revenue came from Regulation Up capacity and

mileage and 67% of the revenue came from Regulation Down capacity and mileage <sup>1</sup> for its participation in an Electric Program Investment Charge (EPIC) pilot program. While Vaca-Dixon does not have dedicated on-site load, this example underscores the importance of Regulation Up and Regulation Down capacity and mileage payments on the financial impact of regulation on the financial viability of the BESS.

In light of the many important initiatives and efforts CAISO currently has underway, it is useful to consider the prioritization NGR enhancement in a broader context. PG&E believes that use limitation enhancements to the NGR model are a priority, and encourages CAISO to move forward with them as a part of ESDER Phase 2, as storage procured due to Commission adopted storage procurement targets could be coming online as early as 2017 and 2018. While PG&E recommends user-specified operating ranges for REM as a higher priority than multiple configurations for the NGR model, for PG&E, both of these issues are lower priorities in the broader context of CAISO initiatives underway. PG&E recognizes that other initiatives and efforts are likely to be prioritized given CAISO's limited time and resources. <sup>2</sup>

### **Demand response enhancements**

*The CAISO is proposing to explore two possible areas of demand response enhancement: (1) Exploring the ability for PDR to be dispatched to both curtail and increase load, and provide regulation service; and (2) developing alternative baselines to assess the performance of PDR and RDRR.*

*The CAISO is requesting stakeholders provide comments on these two areas of enhancement and consider the following:*

*Demand response enhancement topic area #1 – Ability for PDR to both curtail and consume energy:*

- *What issues does this working group need to address and resolve to enable load consumption capability? For example:*
  - *How would financial settlements work given wholesale bids cause an increase in retail consumption and demand?*

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<sup>1</sup> Please note, these percentages do not total 100% because the resource was also charged for some market services (e.g., charging). During this time frame (8/1/15-8/31/15) this resource was bid in for 18 hours each day (with 6 hours not bid for regulation to manage the SOC of the resource).

<sup>2</sup> For example, PG&E has encouraged CAISO to start stakeholder initiatives on the following high priority topics: CRR Revenue Inadequacy, Real-Time Congestion Offset and Marginal Loss Surplus Allocation. PG&E anticipates an even greater need to address these issues as CAISO's exploration of expansion continues. Given these other priority items, PG&E would be open to considering longer lead times to address NGR enhancements for issues other than use limitations.

- *What does consumption mean? Is consumption when a load exceeds its “normal” maximum consumption at certain times or under certain conditions?*
- *What are appropriate baselines/Performance Evaluation Methods?*
- *Is there any differences if load consumption results from a BTM device versus true load consumption?*
- *Retail and wholesale impacts of over or under performance?*
- *CAISO Grid Management Charges for load consumption?*
- *Are any state policies impacted by wholesale-directed retail load consumption?*
- *Suggest a proposed schedule and milestones for working group to deliver a Draft Final Proposal by September 8, 2016 (use the stakeholder process schedule on pages 22-23 of the March 22 Issue Paper as a guide).*

#### **PG&E Comments:**

##### Introductory comment on MUAs as it relates to PDR/RDRR:

On an introductory level, PG&E notes primarily that the set of questions posed by the CAISO in the template here do not match the questions posed in the CAISO ESDER Track 2 Issue Paper. The ESDER Track 2 Issue Paper includes one additional question referring to retail rate impacts if a storage device is responding to wholesale load consumption signals.<sup>3</sup>

PG&E supports the deferment of this particular question, as well as other questions related to retail rate impacts of PDR/RDRR enhancements<sup>4</sup> to the Multiple Use Applications (MUA) section because questions pertaining to retail rate impacts are inherently directed to storage located behind the customer meter that simultaneously serves retail load, which meets the MUA definition.

##### Challenges and Initiatives that May Help Inform Load Consuming Demand Response:

The CAISO poses thoughtful questions about how load consuming DR would operate. Generally speaking, the current paradigm for Demand Response is one that incents load reduction. Likewise, rates -- especially for customers on TOU rates with demand charges -- can create disincentives for increasing load. At the same time, there are not clearly defined market signals for over-generation conditions. While negative energy prices and generation curtailment may serve as useful proxies, these have not been fully explored as key indicators for over-supply.

<sup>3</sup> CAISO Track 2 Issue Paper, Section 3.2.1, question 2.

<sup>4</sup> Enhancements to PDR/RDRR include any services beyond load reduction, including energy, spinning reserve, non-spinning reserve and regulation services, as listed in the ESDER Track 2 Issue Paper section 3.2.1.

The good news is that efforts are underway to explore these issues that may positively inform the efforts scoped into ESDER Phase 2. PG&E is identifying these efforts in these comments in order to help the CAISO and other interested parties shape the appropriate next steps.

- PG&E is currently undertaking an Excess Supply Pilot (XSP)<sup>5</sup> program that was adopted by D.14-05-025. Briefly, this pilot program will offer customers an incentive to consume energy when directed to do so by PG&E in the day-ahead market. Customers would be paid based on their performance relative to a baseline. This pilot is designed to test customer response, triggers for calling an event, as well as the proposed baseline.
- Some of the critical issues pertaining to over-supply are currently being explored in the CPUC's Water Nexus OIR<sup>6</sup> and specifically the Energy Matinee Pricing Tariff<sup>7</sup> ("Matinee Pricing" pilot). On March 21, the Commission provided further direction to each of the three utilities to target programs for operation as early as spring of 2017. Each of the three utility programs is somewhat different. PG&E's Matinee Pricing Pilot is expected to be a TOU based rider that would encourage customers to consume energy in the spring in hours and at pricing that is known in advance.

In response to the question regarding "state policies impacted by wholesale-directed retail load consumption," PG&E understands that PDR/RDRR was designed for load reduction and therefore may need to be modified from a tariff and/or process standpoint. Furthermore, there could be overlap with state-jurisdictional retail considerations in developing wholesale programs intended to accommodate load shift, which may appear to be load increasing during certain intervals. Finally, PG&E believes that before a schedule and related milestones are established for a Working Group, the nature and scope of the deliverable needs to be defined. In terms of activities that PG&E is undertaking with respect to the Matinee Pilot and the XSP, the full learnings are expected to occur beyond the October 2016 timeframe, which is scheduled for CAISO adoption of Phase 2.

*Demand response enhancement topic area #2 – Alternative baselines to assess the performance of PDR/RDRR:*

- *What baseline methods should the CAISO add and why?*
- *If a performance method is recommended that requires a control group, how would third parties be able to cost-effectively set-up and operate control groups? Are there services the UDC could provide in this area?*

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<sup>5</sup> Additional details can be found at <http://olivineinc.com/xsp/>

<sup>6</sup> R. 13-12-011

<sup>7</sup> Pursuant to December 2, 2015 "ASSIGNED COMMISSIONER'S RULING SEEKING ENERGY MATINEE PRICING TARIFF PROPOSALS," PG&E filed on February 4, 2016 a "Non-Residential Matinee Pricing Pilot."

- *What tools and capabilities will the CAISO require to assess best fit for different types of PDR aggregations?*
- *Suggest a proposed schedule and milestones for working group to deliver a Draft Final Proposal by September 8, 2016 (use the stakeholder process schedule on pages 22-23 of the March 22 Issue Paper as a guide).*

#### **PG&E Comments:**

PG&E agrees that the application of baseline methodologies merit ongoing refinements. The current baseline methodology (i.e., 10-in-10) is predicated on infrequent DR events. However, with grid changes occurring as California moves towards a 50% RPS level, the frequency and magnitude of DR events will change. DR will transition from an infrequent peak shaving product to one that is more frequently utilized to address grid needs, such as over-generation and steep ramping. As such, if an Energy Storage device is utilized on a frequent basis to support DR events, the current baseline paradigm needs to change to reflect this shift.

Improvements and/or variations to the existing 10-in-10 baseline methodology are being explored. Specifically, PG&E pointed out in its response to an ALJ Ruling regarding the 2017 DR Transition Proposal<sup>8</sup>, that as part of its Demand Response Emerging Technology (DRET) Assessment, the company is planning to work with the Stanford Linear Acceleration Center (SLAC) to apply an open-source modeling tool (VISDOM) to leverage a clustering technique to evaluate load shapes. The aim is to identify different baselines that may be better suited for different customer classes (Mass Market vs LCIA)<sup>9</sup> with different demographics. The initial results are expected towards the end of 2016.

In terms of a Working Group effort, PG&E believes that it could be utilized to develop a framework, which articulates a shift from infrequent to frequent use DR. The focus of this Working Group could be expanded based on the results of the aforementioned DRET Assessment. At this point, PG&E refrains from advancing a schedule, as the project scope should be first defined.

#### **Multiple-use applications**

*To avoid redundant and potentially divergent efforts the CAISO will initially address this topic by participating in the CPUC Order Instituting Rulemaking (R.) 15-03-011, Track 2. The CPUC and CAISO are planning to hold a joint workshop May 2-3, 2016. If the CPUC proceeding identifies*

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<sup>8</sup> PG&E's March 24, 2016 response per ALJ Questions issued on March 16, 2016.

<sup>9</sup> Mass Market generally represents residential and small business customers while LCIA represents Large Commercial, Industrial and Agriculture customers.

*issues that should be addressed in a CAISO initiative, or develops proposals the CAISO should consider formally adopting, the CAISO can open a new initiative or expand ESDER Phase 2.*

*The CAISO is requesting stakeholders provide comments on this topic area as well as this proposed approach.*

### **PG&E Comments:**

PG&E applauds the CAISO for working jointly with the CPUC via the Energy Storage OIR (R.15-03-011) to resolve issues and develop rules around MUA, which presents jurisdictional overlap between the FERC and CPUC when MUA cases involve DERs located behind the customer meter simultaneously serving retail load. As outlined in the PDR/RDRR section, PG&E believes that PDR/RDRR enhancements applied to customer sited DERs simultaneously serving retail load should be moved to this section (i.e. Multiple-use applications).

In addition, PG&E requests that any wholesale product enhancements – PDR/RDRR or NGR – should not apply to customer-sited DERs simultaneously serving retail load until clear rules on rates, interconnection, metering and other operational issues have been developed at the CPUC via final decisions in R.15-03-011. Customer-sited DERs will not be able to provide an expanded set of wholesale services safely and reliably until these rules are developed.

If and when a set of expanded services in CAISO markets is available to customer-sited DERs simultaneously serving retail load, PG&E supports CAISO examining additional enhancements to PDR/RDRR to enable these services, in addition to the enhancements made to NGR through this initiative. As PG&E gains additional experience through pilot programs and as additional details arise on the expanded set of market services, PG&E would encourage the CAISO to explore additional PDR/RDRR enhancements. Since NGR considers assets as wholesale in all operating hours, NGR may present even more jurisdictional overlap and operational challenges than PDR/RDRR.<sup>10</sup>

### **Distinction between charging energy and station power**

*Under this topic the CAISO intends to resolve the distinction between wholesale charging energy and station power. Although this is also a topic in Track 2 of the CPUC's energy storage proceeding, station power is specifically addressed in the CAISO tariff and the CAISO will primarily address this issue in ESDER Phase 2. However, because the question of station power is inherently jurisdictional, the CAISO intends to also contribute to this topic in Track 2 of the*

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<sup>10</sup>As noted in the NGR enhancement section, PG&E's Yerba Buena pilot is participating in NGR while some of the resource's capacity is also providing services to the customer. As a pilot project, this resource has a somewhat atypical metering arrangement and may not be representative of future retail/wholesale MUA.



CPUC's energy storage proceeding as may be necessary. In doing so the CAISO will seek to economize its staffing resources where possible and avoid redundant efforts, and will also seek to avoid the conflicts that have arisen in the past over the wholesale/retail line.

The CAISO is requesting stakeholders provide comments on this proposed approach as well as respond to the following questions:

- Should the CAISO modify its definition of [station power](#) to better accommodate energy storage resources?
- Should battery temperature regulation be considered part of charging (similar to efficiency loss) and subject to a wholesale rate, or should it be considered consumption/station power subject to a retail rate (where consumption exceeds output in an interval)?
- Are there any means besides separately metering the storage device by which the CAISO should distinguish between charging and station power?

#### **PG&E Comments:**

The CAISO has correctly identified most of the key issues on station use. The CPUC has jurisdiction for appropriate retail charges for station power, including the question of whether or not a sale of retail power has occurred. Therefore, the CPUC should take the lead, working in conjunction with the CAISO to implement clear station power rules applicable to storage.

PG&E believes that certain key principles should guide the Station Power discussion for *in-front of-the-meter* resources.<sup>11</sup> These include the following:

- All Station Power should be charged at the applicable retail rates.
- Charging energy to support wholesale sales should be charged at wholesale rates.
- The definition of Station Power should be largely consistent with what is applied to conventional generation.
- The CAISO and retail providers should have flexibility in the measurement of Station Power, which may be complicated by variations in technology and configuration.
- Any treatment of Station Power should take into account measurement of State of Charge within the NGR model.

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<sup>11</sup> PG&E understands any discussion on Station Power to apply only to in-front-of-the-meter resources and not any behind-the-meter resources.

The station power definition for energy storage should be generally consistent with the definition used for conventional generation, so any change in definition must be carefully determined.

While the definition of Station Power should be consistent with that applied to conventional generation, the measurement of Station Power and application of tariffs may need to be different across technologies. Energy storage resources present a challenge if both charging energy and Station Power are metered by the same meter demand channel. Parties should discuss various options to address this challenge, which can include requiring separate retail service, an administrative allocation, or detailed metering and subtractive metering requirements with consideration to reduce administrative burden. Given the complexity in storage technologies and possible configurations, PG&E recommends that the CAISO and retail providers retain flexibility in measurement of in-front-of-the-meter Station Power.

### **Review allocation of transmission access charge to load served by DER**

*The CAISO is proposing to review the rules for determining load subject to the transmission access charge (TAC) to reflect the effects of utility-side distributed generation, as proposed by Clean Coalition.*

*The CAISO is requesting stakeholders provide comments on this topic area. In particular, please comment on the three concerns the CAISO raised in the issue paper, and if possible offer examples to help illuminate these concerns.*

- 1. Transmission investment is mainly driven by peak load conditions, which may not be reduced by adding distributed generation (DG).*
- 2. New DG does not offset the cost of transmission that was previously approved and is currently in service.*
- 3. Exempting some load from TAC charges would not decrease PTO revenue requirements, so some costs would be shifted to other customers.*

#### **PG&E Comments:**

The three concerns that CAISO raises in section 3.5 of the Issue Paper are valid. Although a portion of load may be off-set by DG for some periods of time, DG does not eliminate the need for or reduce the cost of existing transmission and the underlying revenue requirement. Exempting some load from paying for a system that was originally developed to support the load, and that the load still relies on, would shift costs in an inequitable manner.

#### **Other comments**

*Please provide any comments not associated with the topics above here.*

**PG&E Comments:**

PG&E has no further comments.