Stakeholder Comments Template

Submitted by	Company	Date Submitted
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NGR enhancements

The CAISO has been focused on two areas of potential NGR enhancement: (1) representing use limitations in the NGR model and (2) representing throughput limitations based on a resource's state of charge (SOC).

The CAISO has concluded that the second area will be re-evaluated once more resources are participating as storage resources modeled under NGR. The CAISO will no longer pursue this area in ESDER 2 and will instead focus its efforts in the first area of potential NGR enhancement.

The CAISO is requesting stakeholders provide comments on the first area.

Specifically:

1. What are the exogenous limitations for NGRs that can't be optimized within the market?
2. What are the opportunity costs and commitment costs that need to be reflected in energy bids to manage limitations?

Comments:

SCE supports CAISO's continued work in this area and is hopeful the NGR Use Limitations working team will be able to identify and implement NGR enhancements to help handle use limitations. SCE has commented on the questions posed above in the past and those comments can be found here:

http://www.caiso.com/Documents/SCEComments-EnergyStorage-DistributedEnergyResourcesPhase2WorkingGroup-Sep13_2016.pdf

Demand response enhancements

Proposals are under development by two stakeholder-led work groups within ESDER 2 in two areas of potential demand response enhancement:

- Baseline Analysis Working Group (BAWG) – Explore additional baselines to assess the performance of PDR when application of the current approved 10-in-10 baseline methodology is sufficiently inaccurate. The BAWG proposes the following settlement options for PDRs and RDRRs:
    - Residential Resources: 4 day weather match by max temperature, control group.
    - Commercial Resources: 10 of 10 with 20% adjustment cap, Average of previous 5 days, control group.
- Load Consumption Working Group (LCWG) – Explore the ability for PDR to consume load based on an ISO dispatch, including the ability for PDR to provide regulation service. The working group has recommended bi-directional PDR modelling. The LCWG proposes to maintain the separation of wholesale and retail energy settlement for increased load consumption. This supposes that the value of increased wholesale consumption, perhaps at a negative price, has value to the DRP or customer since the increased consumption would also be charged under retail rates. Under this construct, is this a feasible concept?

The CAISO is requesting stakeholders provide comments on the proposals of both the BAWG and LCWG.

Comments:

SCE appreciates the efforts made by both demand response (DR) related working groups and believes the initial recommendations should continue to be developed and refined. SCE looks forward to continue participating in the working group as well as in the larger stakeholder process.

SCE supports the LCWG proposal to maintain the separation of wholesale and retail energy settlement for increased load consumption. In past comments, SCE has supported this aspect of the proposal because, among other purposes, it helps eliminate jurisdictional issues while also maintaining the same relationship between wholesale market payments and retail billing that exists for current load reduction demand response.

The stakeholder comments template asks:

"The LCWG proposes to maintain the separation of wholesale and retail energy settlement for increased load consumption. This supposes that the value of increased wholesale consumption, perhaps at a negative price, has value to the DRP or customer since the increased

consumption would also be charged under retail rates. Under this construct, is this a feasible concept?"

SCE believes this is appropriate and, given is how demand response works today, does not understand why it could not be feasible. Retail rates account for more than just wholesale market costs (including distribution costs). Increased load consumption, even when directed by the CAISO through a new DR product, still requires use of the distribution system, transmission system, and other factors and those costs need to be accounted for. This construct also appropriately assumes that there is potential value to increased load from customers. Customers have the choice at which price point to bid increased load consumption. Even if the price a customer is bidding does not completely offset their retail bill, the load consumption product is effectively acting as a discount to their retail bill.

There are still multiple details that need to be developed for the load consumption product. In the last set of comments, SCE identified issues surrounding baseline applications and uninstructed imbalance energy[1]. In addition to these issues, SCE believes the stakeholder process needs to eliminate revenue insufficiency issues created by the load consumption product.

Similar to the revenue insufficiency created by traditional DR, load consumption DR will create a need for uplift since both the DR resource and Load Serving Entity (LSE) load are being compensated for the increased load during periods of negative prices. A DR resource will in effect be paid for consuming energy at a negative LMP while the LSE will see an increase in load in the real time market, likely at a discounted DLAP price, and be compensated as well. That means for every 1 MW of load consumption DR dispatched by the CAISO, the CAISO could need to pay for 2 MW of increased consumption. This discrepancy will result in the need for uplift, a market inefficiency, and should be avoided. The CAISO should commit, as part of this process, to work with stakeholders to resolve this issue before finalizing a proposal.

Multiple-use applications

The ISO has not yet identified specific multiple-use application (MUA) issues or topics that require treatment in ESDER 2. The CAISO proposes to continue its collaboration with the CPUC in this topic area through Track 2 of the CPUC's energy storage proceeding (CPUC Rulemaking 15-03-011). If an issue is identified that should be addressed within ESDER 2 the CAISO can amend the scope and develop a response.

[1] http://www.caiso.com/Documents/SCEComments-EnergyStorageandDistributedEnergyResourcesPhase2-RevisedStrawProposal.pdf

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

Comments:

SCE agrees that the CPUC's energy storage proceeding is the correct place to address multiple-use applications at this time. SCE is particularly interested in the CPUC and the CAISO developing rules for resources that provide both distribution reliability and resource adequacy.

Distinction between charging energy and station power

In this topic area the CAISO will continue its collaboration with the CPUC through Track 2 of the CPUC's energy storage proceeding (CPUC Rulemaking 15-03-011) rather than exclusively through ESDER 2. At this time, the CAISO proposes the following:

- Revise the CAISO tariff definition of station power to exclude explicitly charging energy (and any associated efficiency losses); and
- Revise its tariff later to be consistent with IOU tariffs on state-jurisdictional issues, as needed, in the event that they revise their station power rates. The CAISO speculates that two potential, substantial forms this could take that would require the CAISO to revise its tariff regard netting and metering for storage resources. Specifically:
    - The CAISO currently agrees that negative generation pursuant to CAISO dispatch could be treated commensurate with positive generation such that storage resources could "net" their station power consumption against this negative generation; and
    - The CAISO believes that rather than a mandated "one-size-fits-all" metering configuration, each storage resource could negotiate and agree with its local energy provider on a metering configuration (e.g., single-meter, multiple meters, predetermined deductions/additions, or combinations thereof).

The CAISO is requesting stakeholders provide comments on this topic.

Comments:

The Treatment of Station Power, Metering Requirements, and MUA Should be resolved in Track 2 of the Energy Storage OIR

SCE supports the CAISO's position of resolving issues related to station power, metering configurations, and MUA in Track 2 of the Energy Storage OIR (Rulemaking 15-03-01). All three

of these issues raise questions that must be answered within the jurisdictions of the CAISO and the CPUC. Since the CAISO and the CPUC do not share jurisdictions, neither body has full authority to resolve the issues within their respective spheres of influence. Placing the discussions regarding station power, metering configurations, and MUA in a single forum, with close coordination between the CAISO and the CPUC, will help avoid jurisdictional conflicts that may arise due to dissimilar treatment of station power in the wholesale and retail environments. In addition, a single forum makes better use of stakeholders' time, and can help to prevent the situation where key points may be missed by stakeholder groups due to arguments being raised in one forum and not the other.

The Proposal to "Net" Station Power in the Charging Phase Represents Unequal Treatment of Similarly Situated Customers

SCE's definition of station power is consistent with the current CAISO definition. Station power is defined as end-use load or energy imported from the grid with the intent to be consumed onsite, and with no intent of being resold. Thus, end-use load consists of electrical equipment used in the production of energy products, where the term energy product applies to the range of generation energy and grid-related services provided by traditional generators and energy storage systems. Station power also consists of incidental onsite loads associated with lighting, security, computers, etc., which may be present even when an energy product is not being provided.

Traditional generators are able to net retail station power by the simple fact that the amount of energy being exported from the site exceeds the amount of energy being delivered, within a 15-minute interval, with the difference representing energy that is produced and used onsite (self-supplied). Therefore, retail station power is present when the amount of load delivered to the site exceeds the generation export. As such, energy storage systems are able to net, or self-supply, in the discharge phase of operations when the discharge load exceeds the amount of load being delivered within a 15-minute interval. SCE supports netting during the discharge phase, as it represents equal treatment for similarly situated customers. However, SCE cannot support the position that "netting" retail station power during the charging phase is equivalent to netting associated with traditional generators. In the case of station power used during the charging phase, the station power load and the charging load are additive. In other words, the two types of load are delivered to the site, one for the purpose of resale (the charging load), and the second for the purpose of producing an energy product (the station power). In simple terms, onsite load cannot be deemed to be "self-supplied" if the energy delivered to the site exceeds the amount of energy exported from the site over a 15-minute interval. This same basic principle is used on a 15-minute interval basis to determine if a traditional generator has self-supplied its station power requirements. An illustration of this condition for a traditional generator is provided in LS Power's example on page 54 of the ESDER Phase 2 Second Revised

Straw Proposal where the gas generator registers 2.5 MW (Chart 1 below) of station power in a period prior to the generator producing sufficient power to supply onsite requirements. The LS Power example compares a 100 MW natural gas peaker and a 100 MW energy storage system. The natural gas peaker and the energy storage system are assumed to have 2 MW (Chart 2 below) of various auxiliary loads during operation, and this 2 MW is inclusive of the idle loads.

Chart 1 – LS Power Gas Peaker Generation and Station Power Curve

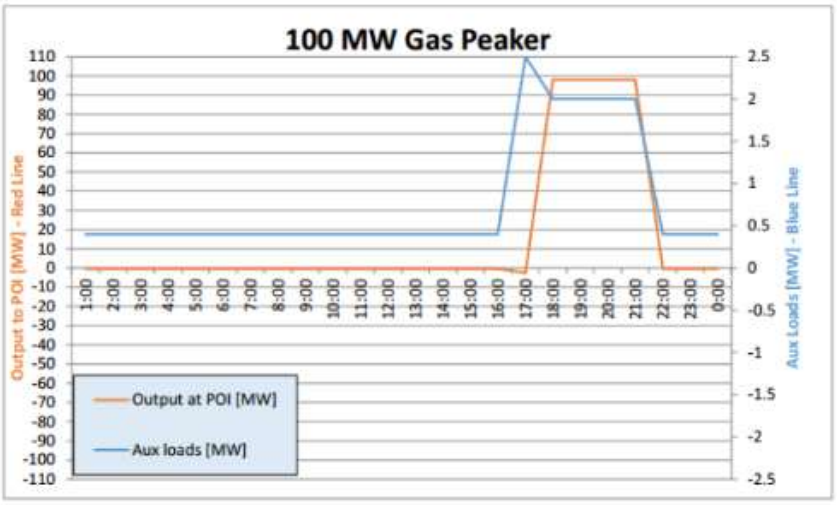
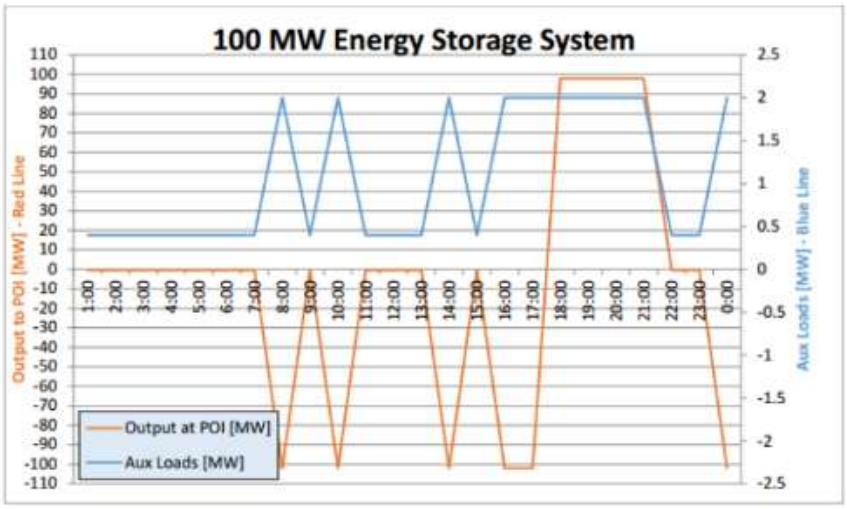


Chart 2 – LS Power Energy Storage Power Curve



The station power used in the startup phase of the gas generator's operations is analogous to the charging phase of the energy storage system, in that electricity is being delivered and used onsite for purpose of producing an energy product, and the generation output does not exceed the onsite power requirements. LS Power's proposal would result in unequal treatment for these similarly situated customers by applying retail rates to the 2.5 MW of gas generation station power, but allowing the same type of delivered load to be "netted" for energy storage systems. Based on LS Power's proposal and the example LS Power provided in its ESDER Phase 2 Stakeholder comments,[2] if the operation profile and LMP values are held constant, "netting" of station power during charging would result in following cost shift:

Frequency	**Netting Cost Shift**
50% of Days of the Year	$299,917
67% of Days of the Year	$401,889

Specific Metering Configurations Should Not Be Mandated at this Stage

SCE agrees with the CAISO's characterization of the challenges regarding metering of energy storage systems. A one-size-fits all configuration is not the standard for traditional generation, and similarly should not be mandated for energy storage devices. While SCE believes the requirements for metering configurations should not be mandated, specifically with respect to the number and types of service points, there is a need to set guiding principles regarding the isolation of charging load. These principles are necessary from both the LSE and CAISO perspectives in order to distinguish station load from instructed load. SCE supports the CAISO's position of allowing energy storage customers and LSEs to develop a mutually agreeable metering configuration as long as station power loads can be distinguished through a governing set of principles. For example, the energy storage system could be configured to allow for charging and discharging energy to be separately metered through a Net Generator Output (NGO) meter located behind a single point of service along with the primary meter. This type of configuration represents a reasonable compromise that allows for load settlement determination, and provides the LSE with the ability to identify and treat station power consistent with other similarly situated customers.

[2] See LS Power CAISO ESDER Phase II Revised Straw Proposal Example (Tables 3 & 4)

LS Power CAISO ESDER Phase II Revised Straw Proposal Example

Table 3: 100 MW Battery Energy Storage System – Single Meter – Station Power Netted on Positive Generation Only

		Modeled Energy Storage System: Charge Price < $15, Discharge Price > $50								
Hour Ending	LMP [$/MWh]	Charge MW	Discharge MW	Aux Loads [MW]	Output at POI [MW]	SOC [%]	Permitted netting ? [Y/N]	Cost of Charging Energy	Revenue from Discharge	Cost of Station Power
1:00	$ 23.20	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
2:00	$ 21.97	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
3:00	$ 18.19	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
4:00	$ 18.96	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
5:00	$ 19.39	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
6:00	$ 27.79	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
7:00	$ 26.23	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
8:00	$ 13.82	100	0	2	-102	20%	FALSE	$ (1,381.95)	$ -	$ (300.00)
9:00	$ 16.61	0	0	0.4	-0.4	20%	FALSE	$ -	$ -	$ (60.00)
10:00	$ 12.75	100	0	2	-102	40%	FALSE	$ (1,274.79)	$ -	$ (300.00)
11:00	$ 17.14	0	0	0.4	-0.4	40%	FALSE	$ -	$ -	$ (60.00)
12:00	$ 19.79	0	0	0.4	-0.4	40%	FALSE	$ -	$ -	$ (60.00)
13:00	$ 18.00	0	0	0.4	-0.4	40%	FALSE	$ -	$ -	$ (60.00)
14:00	$ 13.88	100	0	2	-102	60%	FALSE	$ (1,388.02)	$ -	$ (300.00)
15:00	$ 15.41	0	0	0.4	-0.4	60%	FALSE	$ -	$ -	$ (60.00)
16:00	$ 12.46	100	0	2	-102	80%	FALSE	$ (1,245.61)	$ -	$ (300.00)
17:00	$ 13.85	100	0	2	-102	100%	FALSE	$ (1,385.44)	$ -	$ (300.00)
18:00	$ 68.30	0	100	2	98	75%	**TRUE**	$ -	$ 6,829.71	**$ (136.59)**
19:00	$ 160.11	0	100	2	98	50%	**TRUE**	$ -	$ 16,010.65	**$ (320.21)**
20:00	$ 173.95	0	100	2	98	25%	**TRUE**	$ -	$ 17,395.05	**$ (347.90)**
21:00	$ 116.86	0	100	2	98	0%	**TRUE**	$ -	$ 11,685.71	**$ (233.71)**
22:00	$ 23.07	0	0	0.4	-0.4	0%	FALSE	$ -	$ -	$ (60.00)
23:00	$ 24.22	0	0	0.4	-0.4	0%	FALSE	$ -	$ -	$ (60.00)
0:00	$ 11.50	100	0	2	-102	20%	FALSE	$ (1,149.93)	$ -	$ (300.00)
							Totals	*$ (7,825.74)*	*$ 51,921.12*	*$ (3,678.42)*

Table 4: 100 MW Battery Energy Storage System – Single Meter – Proposed Rules where Station Power is Netted on Positive and Negative Generation

		Modeled Energy Storage System: Charge Price < $15, Discharge Price > $50								
Hour Ending	LMP [$/MWh]	Charge MW	Discharge MW	Aux Loads [MW]	Output at POI [MW]	SOC [%]	Permitted netting ? [Y/N]	Cost of Charging Energy	Revenue from Discharge	Cost of Station Power
1:00	$ 23.20	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
2:00	$ 21.97	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
3:00	$ 18.19	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
4:00	$ 18.96	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
5:00	$ 19.39	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
6:00	$ 27.79	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
7:00	$ 26.23	0	0	0.4	-0.4	0	FALSE	$ -	$ -	$ (60.00)
8:00	$ 13.82	100	0	2	-102	20%	**TRUE**	$ (1,381.95)	$ -	**$ (27.64)**
9:00	$ 16.61	0	0	0.4	-0.4	20%	FALSE	$ -	$ -	$ (60.00)
10:00	$ 12.75	100	0	2	-102	40%	**TRUE**	$ (1,274.79)	$ -	**$ (25.50)**
11:00	$ 17.14	0	0	0.4	-0.4	40%	FALSE	$ -	$ -	$ (60.00)
12:00	$ 19.79	0	0	0.4	-0.4	40%	FALSE	$ -	$ -	$ (60.00)
13:00	$ 18.00	0	0	0.4	-0.4	40%	FALSE	$ -	$ -	$ (60.00)
14:00	$ 13.88	100	0	2	-102	60%	**TRUE**	$ (1,388.02)	$ -	**$ (27.76)**
15:00	$ 15.41	0	0	0.4	-0.4	60%	FALSE	$ -	$ -	$ (60.00)
16:00	$ 12.46	100	0	2	-102	80%	**TRUE**	$ (1,245.61)	$ -	**$ (24.91)**
17:00	$ 13.85	100	0	2	-102	100%	**TRUE**	$ (1,385.44)	$ -	**$ (27.71)**
18:00	$ 68.30	0	100	2	98	75%	**TRUE**	$ -	$ 6,829.71	**$ (136.59)**
19:00	$ 160.11	0	100	2	98	50%	**TRUE**	$ -	$ 16,010.65	**$ (320.21)**
20:00	$ 173.95	0	100	2	98	25%	**TRUE**	$ -	$ 17,395.05	**$ (347.90)**
21:00	$ 116.86	0	100	2	98	0%	**TRUE**	$ -	$ 11,685.71	**$ (233.71)**
22:00	$ 23.07	0	0	0.4	-0.4	0%	FALSE	$ -	$ -	$ (60.00)
23:00	$ 24.22	0	0	0.4	-0.4	0%	FALSE	$ -	$ -	$ (60.00)
0:00	$ 11.50	100	0	2	-102	20%	**TRUE**	$ (1,149.93)	$ -	**$ (23.00)**
							Totals	*$ (7,825.74)*	*$ 51,921.12*	*$ (2,034.94)*

Other comments

Please provide any additional comments not associated with the topics above.

Comments:

SCE has no other comments at this time.