These notes summarize the Load Shift Working Group workshop facilitated by Gridworks. For a stakeholder list and presentations for this meeting (and for previous meetings), go to [www.gridworks.org/initiatives/load-shift-working-group](http://www.gridworks.org/initiatives/load-shift-working-group) or contact Laura Wang at lwang@gridworks.org for more information.

**AGENDA**

1. Purpose for 3/21/18 meeting: Establish attributes of a load shift product, develop consensus on what market participation means, and determine remaining threshold questions for the LSWG.**10:00 – 10:20am:** Intro and Purpose *(Matthew Tisdale, Gridworks)*
2. **10:20 – 12:00pm**: Homework Findings *(Gridworks and subgroup leads)*
3. **12:00 – 1:00 pm**: Lunch
4. **1:00 – 2:30pm:** Addressing Threshold Questions: Market Participation
	1. Load Bidding *(Gigio Sakota, SCE and Peter Alstone, LBNL)*
	2. PDR Enhanced *(Eric Kim, CAISO)*
	3. Retail Program Informed by LMPs *(Nora Sheriff and Paul Nelson, CLECA)*
	4. Facilitated Discussion *(Gridworks)*
5. **2:30 – 3:00pm:** Next Steps *(Gridworks)*

**SUMMARY**

1. **Introductions and Purpose**

Matthew Tisdale (Gridworks) facilitated introductions of stakeholders in the room and on the phone and restated the purpose of the LSWG, per D. 17-07-017.

The following participants participated in person:

* Jean Lamming, CPUC
* Fabienne Arnoud, PG&E
* Anja Gilbert, PG&E
* Laura Wang, Gridworks
* Gigio Sakota, SCE
* Peter Alstone, LBNL
* Jin Noh, CESA
* Eric Kim, CAISO
* Jill Powers, CAISO
* Navid, CAISO
* Ted Ko, Stem
* Brian Gerke, LBNL
* Peter Schwartz, LBNL
* Laura Grey, CALSSA
* Paul Nelson, CLECA
* Nora Sheriff, CLECA
* Nuo Tang, SDG&E
* Helena Oh, CPUC
* Aloke Gupta, CPUC
* Ryan Bullard, SCE
* Erica Keating, SCE
* Brian Kooiman, Ohmconnect
* Jonathan Burrows, PG&E
* Eric Gimon, Energy Innovation
* Mike O’Boyle, Energy Innovation
* John Hernandez, PG&E
* Robert Anderson, Olivine

The following participants participated over the phone:

* Merrian Borgeson, NRDC
* Nick, AMS
* John Hart, CSE
* Jingjing Lu, LBNL
* Tanner Kural, CEC
* Nicholas Connell, AMS
* Pramod Kulkarni, Customized Energy Solutions
* Ariana Winston
* Malcolm Ainspan, NRG Curtailment Solutions
* Doug Karpa, Clean Coalition
* Mona Tierney-Lloyd, Enernoc
* Owen Howelett, SMUD
1. **Shift Potential Presentation**

Subgroup leads *(Brian Kooiman, Ohmconnect – Group 1; Fabienne Arnoud, PG&E – Group 2; Ryan Bullard and Erica Keating, SCE – Group 3; Helena Oh, CPUC ORA – Group 4)* presented on the results of their group discussions. Groups were asked to discuss: 1) definitions and attributes of a load shift product; 2) threshold questions; and 3) prioritization and sequencing of topics. There were 35 discrete participants in these conversations, totaling 45 person-powered hours of progress.

Overarching themes emerged from each subgroup conversation. These notes emphasize where general agreement was reached by the working group using **bold typeset**.

* Attributes of the definition of “load shift”:
	+ Overall definition: **There is overall agreement and convergence at a high-level with the LBNL definition of “load shift” is aligning shiftable load with renewable generation.**
	+ Energy neutral: **There is overall agreement that this is not necessarily a defining characteristic, and that the “take” and “shed” portions may be asymmetric, more representative of grid needs, or market efficiency**. There was one minority position which stated that energy neutrality may be important, and that time horizons may be an important parameter (e.g., energy neutrality over a 24hour period).
	+ Technology neutral: **There is overall agreement that the end-product(s) should be technologically neutral**, while also acknowledging that some technologies may thrive while others don’t- similar to the existing DR model providing curtailment service today.
		- There is a relationship between energy neutrality and technology neutrality, whereby constraining one may impact the other (e.g. forcing energy neutrality may impose constraints on what technologies can participate because different technologies have different levels of return efficiency (operational losses).
	+ **There is overall agreement that the product should reflect grid needs from the integration of renewables**, while accounting for customer needs and capabilities. Specifying grid needs will be a key focus of the working group.
		- With regards to grid needs, there is not full agreement yet as to what the load shift product(s) is/are “solving” for. In addition, what we may be solving for may change in a few years. Considering 1) level of certainty and 2) time frames are important, as well as understanding what other products or tools already exist.
* Commission expectations:
	+ There was increasing clarity on what the Commission expects from this Working Group. Clarifications provided by Commission staff to date include:
		- Multiple products may be proposed.
		- Retail rates are out of scope, but the WG should be mindful of the interaction with retail rates, and complementary where possible
		- The product(s) should be “integrated” with the wholesale market. However, this can be translated into several market participation models (discussed below); the limits to pursuing these options are practical rather than regulatory driven
		- **For the Commission, energy neutrality is not a driver or principal focus**
* Options for Wholesale Market “Integration”:
	+ Participants discussed the definitions of what it would mean for the product(s) to be “market integrated” and “CAISO dispatchable”. Some participants suggested that a bi-directional dispatch may be feasible, but is not necessarily a product requirement.
		- The meaning of “CAISO Dispatchability” itself is still an open question. Some participants suggested that a non-dispatchable solution is akin to rate design, and may address a longer-term solution.
	+ WG members sought additional clarity on what a load bid product might look like, how a retail product may be “informed” by wholesale market prices, and how PDR may be enhanced (and to what effect).
	+ WG members brought up the need to consider the customer engagement perspective and customers’ willingness to participate when designing a product.
* Threshold questions:
	+ **Certain threshold questions remained, including:**
		- **What do we mean by “CAISO integrated”?**
		- **How will the product be dispatched?**
		- **What will the frequency of the product be?**
		- **Should the product receive RA value?**
* Prioritization and sequencing:
	+ There is not full agreement on how the WG should sequence its work going forward. The schedule depends on the degree of consensus around the product(s) definition. Some variations on Paths A[[1]](#footnote-1) and B[[2]](#footnote-2) were suggested by WG members. A variation was also suggested, whereby the WG addresses products by different levels of market integration, and decides whether each type of product, or a subset, may be recommended

*Discussion:*

* **Participation Agreements vs. CAISO Models:** Jill Powers (CAISO) clarified some of the different resource participation models and existing agreements. Existing agreements include DR agreements (DRP-A), DER aggregation agreements (DERP-A), and other participating generating agreements, each with different governing rules. Various resource participation models falling under these agreements help define whether aggregators may participate, whether resources may export, and whether they qualify for RA. One example given: The NGR model allows for both consumption and curtailment. The NGR model allows for both bidding and dispatchability of load increase and load decrease, and attributes could also be a part of the DRP agreement. Aggregated DER resources participating in the DERP agreement, do not currently qualify for RA. Currently, there is a challenge in determining qualifying capacity (QC) of aggregated resources for the DERP-A, which is dependent on the adoption of additional CPUC rules. The WG discussed the relationship between these CAISO policies and their relationship to the Load Shift WG. CAISO suggested that this WG may focus on models and product(s) that fall more in the DR space (PDR, not NGR). WG participants discussed whether characterizing a product as a DR product versus a DER product fundamentally shifts how we think about the product with regards to implementation and policy considerations.
* **Value to the Grid:** There was a discussion related to the value to the grid that the load shift provides. Ted Ko (Stem) noted that a product should be designed considering grid value in mind, and it should be left up to the providers to determine whether they can meet that value economically. Jean Lamming (CPUC) asked the group how it should define grid needs.
* **RA value:** Participants discussed at length whether a potential load shift product should receive RA value, or meet the same obligation as RA resources. Participants identified that daily or frequent must-offer obligations for RA products become challenging as both an engineering problem as well as a potential market manipulation issue. Eric Gimon (Energy Innovation) noted that, without an RA component, it may be a long time before business models are developed. Anja Gilbert (PG&E) identified that under existing policy, DR products must have direct participation integration into the market to receive RA value. While the WG is required to make a recommendation to the RA proceeding, this is still an open question.
* **Focus on “shed” versus “take”:** Fabienne Arnoud (PG&E) pointed out that the focus on “shed” in the WG discussion reflects the idea that “take” and “shed” may be thought of separately, and that RA may be an additional value that “shed” provides. Anja Gilbert (PG&E) pointed out that “take” and “shed” are not addressing the same issues and that “take” addresses an economic issue today while “shed” addresses a reliably issue. Many participants seemed to agree that “take” products should not receive RA value as load increase is not addressing a reliability concern, but rather an issue of over supply which CAISO has other tools to address such as curtailment or export (via the Energy Imbalance Market). Peter Alstone (LBNL) encouraged the WG to think about secondary effects that may create value for the system (e.g., taking load in the middle of the day likely reduces load at later peaks, which may reduce RA procurement obligations). Estimating this value may be important. Mona Tierney-Lloyd (Enernoc) expressed a minority opinion, that both load increase and decrease can create reliability problems, and shed and take should be looked at together as a solution.
* **Value Stream: Incremental or New?** There was discussion whether a load shift product may be a new value stream or product or an add on to an existing value stream. WG participants asked whether load shift is only an energy product, or if it provides capacity value, or both? Developing an energy product doesn’t necessarily preclude it from providing RA services if it is flexible/dispatchable (i.e., eligible for flex RA if it can meet the requirements and eligible for RA for curtailment as today). There was discussion and disagreement as to the level of value for load shift products. Ted Ko (Stem) stated that they are not expecting this particular value stream to be sufficient by itself, rather that it may be an addition to the existing value stack. Gigio Sakota (SCE) noted that SCE sees load shift as helping resources at the edge of being economically efficient by providing additional value, and is not likely to bring in resources that are far out of the market. Eric Gimon (Energy Innovation) disagreed and stated that the WG should aim for greater ambition, though if the group does decide to first focus on near-term products, it is still encouraged that the group leave space to think about shift as a principal reliability product.
* **Request for ESDER 3 Updates:** WG members recommended that CAISO provide a monthly update on the ESDER Phase 3 process to the LSWG, as timing of that process is complementary (CAISO reports to its board in the fall).
1. **Options for Wholesale Market “Integration”**

Each of the following presentation decks may be found on <http://www.gridworks.org/intiatives/load-shift-working-group/>

1. Load Bidding *(Gigio Sakota, SCE and Peter Alstone, LBNL)*

The load bid concept is based on the idea of developing more elastic loads that can respond to ISO prices, in addition to pricing effects developed through TOU rate implementation. In this model, LSEs’ demand bids for day ahead prices reflect this additional elasticity through one or multiple (up to 10) bid segments that it can submit for all of its load. Once prices clear, the aggregator then operates the site according to a cost minimizing strategy. This may theoretically reduce the cost of serving load and reduces peak capacity. The presentation additionally discussed the difference between a demand bid and a Proxy Demand Resource (PDR), and discussed the benefits and challenges of this approach such as new baselines between the aggregator and LSE, lack of price difference that can be captured (as there is a limited number of load bid segments), and the inability for aggregators to participate directly without communication with and agreement from the LSE. Full details of the approach may be found in the slide deck.

WG members discussed how cost savings could be calculated and allocated to customers, including challenges of developing a baseline, concerns with how this could impact convergence bidding, and developing a strong value proposition for customers.

1. PDR Enhanced *(Eric Kim, CAISO)*

Eric Kim (CAISO) presented on the load shift product designed under CAISO’s ESDER Phase 3 process. This product is designed for behind-the-meter (BTM) storage as an enhancement to the PDR participation model (fitting under a DR provider agreement). Eric presented on the product’s current key features and remaining implementation questions (including full model, bid, and settlement design questions), which will be discussed at the next CAISO stakeholder workshop on March 29, 2018). Full details of the approach may be found in the slide deck and on CAISO’s ESDER website.[[3]](#footnote-3)

1. Retail Program Informed by LMPs *(Nora Sheriff and Paul Nelson, CLECA)*

Nora Sheriff (CLECA) presented on a proposed pilot retail program for market participation that is informed by wholesale market prices. This product is modeled similar to SDG&E’s vehicle-grid integration (VGI) product, in that it is a retail product that is informed by CAISO’s day ahead price. CLECA envisions the pilot to be focused on large power customers connected at the transmission level, allows dual participation with BIP, and is designed as an energy-only product. CLECA sees the values of this product as reducing renewables curtailment and providing value to in-state resources.

PG&E questioned if this pilot was touching on the gen component of rates and would therefore go against the clarification from the CPUC that this was out of scope. PG&E and CLECA discussed the Excess Supply Pilot (XSP) as a vehicle which also uses wholesale prices to inform dispatch, and as a pilot which may be beneficial to CLECA’s customers as the XSP pilot would allow continued participation in BIP.

**Stakeholders agreed that each of these potential paths to market integration have merit and should be explored. There was general agreement that the group should begin with the “PDR Enhanced” pathway.** CLECA expressed a minority opinion that the Retail Program should be addressed first.

1. Discussion and Next steps

In discussion, there was general agreement that all market options discussed are still on the table. Jean Lamming (CPUC) clarified that the scope language with regards to market integration is high level and encouraged this group to work creatively.

**In addition to spending more time on each of the market “integration” options, it was expressed that it would be beneficial to spend more time on understanding value and grid needs, as well as understanding the customer perspective.**

The following high-level draft Work Plan was discussed:

* Meeting 3 (April 18): Specifying the grid needs served by load shift and beginning to explore value from a grid and customer perspective.
* Meeting 4-5: Enhanced PDR
* Meeting 5-7: Load Bidding
* Meeting 8: Retail Program

The Working Group management team will reach out to participants to support Meeting 3 on April 18, 2018.

1. Path A refers to a WG work plan of choosing definitions of products first and then assessing the value and uncovering the efforts associated with implementing each product. [↑](#footnote-ref-1)
2. Path B refers to a WG work plan of examining the value and efforts associated with load shift in order to define product(s). [↑](#footnote-ref-2)
3. https://www.caiso.com/informed/Pages/StakeholderProcesses/EnergyStorage\_DistributedEnergyResources.aspx [↑](#footnote-ref-3)