

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Enhance the
Role of Demand Response in Meeting the
State's Resource Planning Needs and
Operational Requirements.

Rulemaking 13-09-011
(Filed September 19, 2013)

**PACIFIC GAS AND ELECTRIC COMPANY'S (U 39-E), SOUTHERN
CALIFORNIA EDISON COMPANY'S (U 338-E), AND SAN DIEGO GAS &
ELECTRIC COMPANY'S (U 902-E) LOAD SHIFT WORKING GROUP
STATUS REPORT**

SHIRLEY A. WOO
DARREN P. ROACH

Pacific Gas and Electric Company
77 Beale Street, B30A
San Francisco, CA 94105
Telephone: 415.973.6345
Facsimile: 415.973.0516
Email: Darren.Roach@pge.com

Dated: April 16, 2018

Attorneys for
PACIFIC GAS AND ELECTRIC COMPANY

ATTACHMENT 1

Quarterly Report of the Load Shift Working Group (LSWG)

Pursuant to Decision (D.) 17-10-017

April 16, 2018

Load Shift Working Group Members	
Facilitator	Gridworks
Working Group Member Organizations	Advanced Microgrid Solutions, California Efficiency + Demand Management Council, California Energy Storage Association, California Independent System Operator, California Institute for Energy and Environment, California Large Energy Consumers Association, California Public Utilities Commission (Energy Division and the Office of Ratepayer Advocates), California Solar & Storage Association, Center for Sustainable Energy, Clean Coalition, CPower, Douglas & Liddell, Energy Center, EnerNoc, Humboldt State University, Lawrence Berkeley National Laboratory, Natural Resources Defense Council, Nest, NRG Curtailment Solutions, Ohm Connect, Olivine, OpenEE, Pacific Gas & Electric, San Diego Gas & Electric, SCD Energy Solutions, Sonnen Batterie, Southern California Edison, Steffes, Stem, Strategy Integration, and the Union of Concerned Scientists.

Overview of the Report

This Quarterly Report of the Load Shift Working Group reports on the following:

- A. The tasks for the working group per (D.) 17-10-017;
- B. Summary of the LSWG meetings held to date;
- C. Status of the issues/topics discussed in the working group; and
- D. Next Steps for the working group.

A. Tasks for the working group per D.17-10-017

- Defining and developing new products including load consumption and bi-directional products;
- Developing a proposal of whether and how to pay a capacity value for load consuming and bi-directional products to provide to the RA proceeding;
- Developing a list of data access issues relevant to new models that should be addressed prior to launching new models;
- Developing a proposal on how to better coordinate the efforts of the California Independent System Operator (CAISO) and the Commission;
- Identifying the value of new products to provide to the RA proceeding.

B. Summary of Meetings Held:

The Load Shift working group has met three times and developed a schedule for future meetings.

1. Meeting 1: January 26, 2018

Discussion. The first meeting was a telephonic meeting and provided an overview of the objectives and tasks assigned to the load shift working group. The CPUC clarified what was in and out of scope of the working group. PG&E provided an update that a facilitator was in the process of being hired.

2. Meeting 2: February 28, 2018

Discussion: The second meeting was an in-person meeting facilitated by Gridworks.² The meeting included presentations to orient the group on existing load shift work such as Lawrence Berkeley National Laboratory's (LBNL) Demand Response Potential Study³ and PG&E's Excess Supply Pilot (XSP).⁴ The group also had a preliminary discussion on how the work of the group could be scoped and prioritized. The purpose of presenting the "shift" DR option from LBNL's Demand Response Potentials study was to 1) clarify how LBNL identifies "shift" demand response as different from shed, shimmy, and shape (by use of TOU periods), and 2) answer clarifying questions with regards to the results of the Potential Study. The purpose of presenting operational lessons learned from PG&E's XSP was to provide an example of a new DR model.

The following key themes emerged from the workshop:

- Stakeholders have a range of perspectives on how load shift may be defined. Pursuing a shared definition will be a challenge for the working group.
- A clear relationship exists between "shape" which is a rate and "shift." Understanding that relationship and creating complementary products is important to this effort, but per CPUC guidance the intended outcome of the effort is a shift product (only).
- CPUC guidance for this working group envisions a shift product integrated into CAISO wholesale energy markets. The definition of what "integrated" in this context will be a central issue addressed by the working group.

Homework: The load shift working group was divided into four sub-groups for a homework assignment to answer questions including:

- A.** How should the group define load shift in support of completing Task 1 from D.17-07-017, "Defining and developing new products including consumption and bi-directional products"? Participants were asked to propose definitions as it related to:
- Descriptions of these products in D.17-07-017
 - LBNL's potential study for demand response
 - PG&E's XSP pilot
 - ESDER Phase 3's "charge shift" product

² Load Shift Working Group meeting materials are available on Gridwork's website:

<https://gridworks.org/initiatives/load-shift-working-group/>

³ 2025 California Demand Response Potential Study – Charting California's Demand Response Future: Final Report On Phase 3 Results". (2017) <https://drrc.lbl.gov/publications/2025-california-demand-response>

⁴ XSP tested capabilities of demand side resources to increase load during times of over-generation on transmission and/or distribution lines, as well as times of low or negative prices. For more information, refer to the, "Excess Supply DR Pilot 2015-2016 Summary and Findings (Public Version)" report:https://www.pge.com/pge_global/common/pdfs/save-energy-money/energy-management-programs/demand-response-programs/case-studies/Excess-Supply-Report.pdf

- B. How should the group Prioritize and Sequence its work based on option A and B? Does Options A or B meet the needs of the group, or would you suggest an Option C?

Option A: The workgroup would choose definitions of products first and then assess the value of uncover the efforts associated with implementing each product.

Option B: The workgroup would examine the value and efforts associated with load shift in order to define product(s).

- C. Are there threshold issues or questions that the group needs to consider before effectively prioritizing? If so, what are those issues and questions and how should they be addressed?

3. Meeting 3: March 21, 2018

Discussion: The third meeting was an in-person meeting facilitated by Gridworks. The meeting was split between discussing the outcomes of the homework assignments and providing a deep dive on three options for load shift “market integrated” products including 1.) an enhanced CAISO Proxy Demand Response (PDR) product (i.e., load turned into a supply bid), 2.) a load bidding product, and 3.) a retail product that is not integrated into the market but is informed by wholesale market signals.

Themes emerged regarding a load shift product definition including:

- Overall definition: There was overall agreement and convergence at a high-level with the LBNL definition of “load shift” as aligning shiftable load with renewable generation.
- Energy neutral: There was overall agreement that “energy neutral” (i.e. same amount of “take” and “shed”) is not a defining characteristic, and that the “take” and “shed” portions may be asymmetric, more representative of grid needs, or provide market efficiency. There was one minority position which stated that energy neutrality may be important with a time horizon parameter (e.g., energy neutrality over a 24hour period).
- Technology neutral: There was overall agreement that the end-product(s) should be technologically neutral, while also acknowledging that some technologies may thrive more than others- 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)).
- Grid Needs: There was overall agreement that the product should reflect grid needs for 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. It is important to consider 1) level of certainty expected from the response 2) time frames, and 3.) understanding what other products or tools already exist that can be used for load shift.

The following high-level draft Work Plan was discussed:

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

C. Summary of Status of Working Group:

Issue 1: Technology Neutral

Issue Statement: Is being technology neutral a principle for the working group?

Background: A technology neutral product would allow any technology to participate as an eligible resource providing load shift.

Majority/Minority Positions and Consensus/Non-Consensus Views:

- The majority position is that technology neutrality is a key priority while recognizing that some technologies' or resources' operating characteristics may be better suited than others to provide load shift, similar to today's load reduction DR.

Recommended Policy Changes from Parties:

- No policy change. The conclusion is that the DR new model product should be technology neutral.

Status of Issue: Open or Closed

- Closed.

Issue 2: Energy Neutrality

Issue Statement: Is being energy neutral a principle for the working group?

Background: Energy neutral would mean that on a given interval (for market integration purposes this would likely be daily), total energy consumption ("take") would be followed by an equivalent curtailment ("shed").

Majority/Minority Positions and Consensus/Non-Consensus Views:

The majority position is that energy neutrality is not an important feature of the New DR Product, as:

- There may not be symmetry in what you need in the belly (take) vs. the neck of the duck (shed); with the grid needs not symmetrical, the LSWG should not design a product around symmetry.
- There is a risk that if we are too stringent in developing a product that is energy neutral, we will limit our ability to develop a product that is a viable CAISO alternative to the EIM or renewable curtailment. LBNL acknowledges that an exact match between load increase and load decrease is unlikely in real world conditions.
- Some technologies are not inherently energy neutral (e.g., storage with efficiency losses, HVAC pre-cooling or thermal shifting that will lose heat or have operational adjustments, and energy efficiency) – which leaves valuable DR on the table if energy neutrality is required.

The minority position (CESA) is that energy neutrality may be important.

Recommended Policy Changes from Parties:

- No policy change. The conclusion is that the DR new model product does not have to be energy neutral.

Status of Issue: Open or Closed

- Closed.

Issue 3: Market Integration

Issue Statement: What does it mean for the load shift product to be a market integrated product?

Background: The working group is exploring three paths to market integration including:

- 1.) An enhanced version of CAISO's PDR resource model (e.g., CAISO's ESDER 3's charge shift product)
- 2.) A program not integrated but influenced by wholesale prices (e.g., PG&E's XSP)
- 3.) Load Bidding (currently theoretical)

Table 1: Comparison of Attributes of a Load Shift Market Integrated Product

Attributes	PDR Enhanced: <i>Ex: ESDER 3's "Charge Shift" Product</i>	Program Influenced by Wholesale Prices: <i>Ex: PG&E XSP Pilot Applied to Wholesale Markets</i>	Load Bid <i>Ex: Theoretical</i>
Description	A proposal to create a load increasing product for DR in the CAISO market. Distinct from PDR or RDRR.	A non-CAISO integrated market pilot which calls on participants to increase load based on a variety of factors, including wholesale market prices.	A proposal to incorporate all DR into an LSE's load bid.
Dispatchable or Non-Dispatchable	- TAKE is dispatchable by grid operator -SHED is independent (could be bid in as PDR)		- TAKE is non-dispatchable by CAISO at a granular level as the load increase would be integrated into LSE load bids - SHED could be independently bid
Status Today in the Market: Pathway to CAISO Dispatchability	- Not integrated today as it requires a new or enhanced CAISO participation model. - Could be integrated as a TAKE product with an independent SHED (i.e., PDR or used by customer)		- Load bidding available today - Does not allow for granular dispatchability by CAISO
Technology neutral	Limited to BTM energy storage	Yes	
Dispatched Energy Neutral	-Not by design as SHED is independent (could be bid in as PDR)	-Energy neutral take is not defined as a specific pilot's rule, with participants largely influenced by retail rate to prevent frivolous use). Solving for grid needs first. -SHED is independent (could be bid in as PDR)	-N/A
Capacity Payment	-Possible for the SHED portion, if it participates as PDR -Possible for product if it meets flex RA attributes -TAKE solves an economic issue today; no RA value		Unknown
Available to LSEs & Third Party DRPs	Yes		- Available to LSEs; third parties would not be able to bid independently from an LSE - Limited opportunity for differentiated load increase prices as LSEs only have 10 demand bid segments today.

Majority/Minority Positions and Consensus/Non-Consensus Views:

- There is no majority position or consensus to date on what it means to be market integrated.

Recommended Policy Changes from Parties:

- No policy change recommended to date.

Status of Issue: Open or Closed

- Open; an ongoing discussion in the working group.

Issue 4: Issues out of scope

Issue Statement: What are issues that are related, but out of scope of the LSWG?

Background: There may be some issues that are related to the working group but are out of scope.

Majority/Minority Positions and Consensus/Non-Consensus Views:

- The consensus, based on direction from the Commission is that both rates and DR serving a distribution need are out of scope, as:
 - Rates are being addressed in the GRC Phase 2 and Rate Design Windows. While a future product should not be a retail rate, it should be complementary and mindful of what is occurring related to rates.
 - DR as it relates to serving a distribution need is being addressed in both the Distribution Resources Plan (DRP) and Integration of Distributed Energy Resources (IDER) proceedings.

Recommended Policy Changes from Parties:

- N/A. No policy change recommended

Status of Issue: Open or Closed

- Closed.

Issue 5: Threshold Questions

Issue Statement: What are threshold questions that need to be answered for the working group to proceed?

Background: There may be some issues that need to be addressed prior to moving forward with defining a load shift product.

Majority/Minority Positions and Consensus/Non-Consensus Views:

The majority position of the group is that there are threshold questions that warrant future sessions before creating the product definition of load shift product(s).

- What do we mean by “CAISO integrated” when it comes to a requirement for this product?
- What do we mean by dispatchability as it relates to this product?
- What is the value of this product to the grid?

Recommended Policy Changes from Parties:

- N/A. No policy change recommended

Status of Issue: Open or Closed

- Open

D. Next Steps:

The working group currently has scheduled meetings for: April 18, May 23, June 20, and July 18. The working group has decided to further investigate the following products: PDR enhanced, programs influenced by wholesale market prices, and load bidding.

Future compliance reports are due July 15, October 15, and January 15, until the final report is served on January 31, 2019.