

**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) QUARTERLY LOAD SHIFT
WORKING GROUP STATUS REPORT**

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Dated: October 15, 2018

Attorneys for
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Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE) and San Diego Gas & Electric Company (SDG&E) (collectively IOUs),^{1/} on behalf of the Load Shift Working Group (LSWG), serve the forth LSWG Status Report at Attachment 1, pursuant to the Commission's *Decision Adopting Steps for Implementing the Competitive Neutrality Cost Causation Principle, Requiring an Auction In 2018 for the Demand Response Auction Mechanism, and Establishing a Working Group for the Creation of New Models of Demand Response*, "D. 17-10-017, Ordering Paragraph 12.

Respectfully Submitted on Behalf of the IOUs,

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^{1/} Pursuant to 1.8(d) of the Commission's Rules of Practice and Procedure 1.8(d), SDG&E and SCE have authorized PG&E to make this service on their behalf.

ATTACHMENT 1

Quarterly Report of the Load Shift Working Group (LSWG)

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

October 15, 2018

Facilitator	Gridworks ²
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 Public Advocates Office), 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, OhmConnect, Olivine, OpenEE, Oracle, Pacific Gas & Electric, San Diego Gas & Electric, SCD Energy Solutions, SLAC National Accelerator Laboratory, Sonnen Batterie, Southern California Edison, Steffes, Stem, Strategen Consulting, 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 and the Decision Modifying D. 16-09-056

- 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; and
- Decision Modifying D. 16-09-056
 - Considering an appropriate energy storage emissions metric, as part of any proposals involving energy storage.

² All Load Shift Working Group materials can be found on Gridwork's website at: <https://gridworks.org/initiatives/load-shift-working-group/>

B. Summary of Meetings Held:

The Load Shift working group has met three times since the last compliance report was submitted in July.

- Meeting 7: July 18, 2018: At the July LSWG meeting, the group discussed the challenges of load bidding, engaged in a coordinated small-group exercise with Peter Alstone to brainstorm non-market integrated alternative pathways to demand side management (DSM) participation, and discussed the new requirement that the LSWG “consider” a GHG emissions metric for storage.
 - The group discussed the viability concerns with using load bidding (i.e., including price responsive load increments in LSE bids in the Day Ahead market, coordinating with aggregators who manage loads at customer sites). The challenges noted to this approach include: it may not be open to all parties, since it would require close coordination with an LSE, there would be significant transaction costs to both the LSE and aggregators, there are existing uses of the demand bidding framework that may preclude or be in conflict with this approach. The concept also would not address real time needs, it does not allow a customer to reflect their specific abilities or operational characteristics (i.e., constraints, ramp rates, and commitment costs), or allow for multi-hour planning/optimization. Another key constraint is related to the geographic characteristics of load bids at the DLAP level, which means that local curtailment may not be effectively managed through this approach.
 - The group brainstormed four possible concepts for pilots which do not strictly conform to the original decision guidance for a “market integrated” product, but do achieve the goal of the exercise to consider alternative pathways to DSM participation that could incentivize load shifting. The four pilots include:
 1. Real Time Signal: Load would respond to a continuous signal (either price or GHG).
 2. Pay for Load Shape: Pay a customer to conform their load to a target load shape that is beneficial for the power system (e.g., the “anti-duck shape”).
 3. Pay for Load Shape at the Distribution Feeder: The group took the concept of pay for load shape and applied it to the geographic area of a distribution feeder to minimize distribution issues and maximize the hosting capacity of the feeder, which could apply to future “distribution system operator” business models.
 4. Real Time Pilot: A customer reacts to real time prices passed through.
 - The group discussed the May issuance of D. 18-06-012, which ordered the Load Shift Working Group to, “consider an energy storage emission metric for any storage related proposal.” Key takeaways:
 - Energy storage is not inherently a clean or dirty technology, emissions are determined based on a.) the round-trip efficiency of the resource as it takes energy to keep the battery operating and b.) how the technology is operated. Consistency is needed between rules for storage and rules for DR.
 - Unique to California, GHG emissions are largely correlated with price. When prices are low or negative, it is because renewables are setting the marginal price, although there may be exceptions. If the “take” only occurs when the marginal emissions are zero, there is no problem. Otherwise, there may need to be an alternate calculation to measure the GHG impact of a product that occurs when the marginal emissions are not zero. It should be noted that if there are GHG emissions associated with the resource setting the low price, then that resource will have to comply with California’s cap and trade regulations. Therefore, storage does not allow an emitting resource to escape GHG regulations.
 - Some participants suggested the emissions impact of load shift needs to be a consideration of evaluating the product design.

- Meeting 8: August 22, 2018. At the August LSWG meeting, the group refined the LSWG Evaluation Framework to compare the different LSWG products, CLECA presented their Critical Consumption Period Pilot/Product using the Evaluation Framework, and the IOUs presented the possible impacts of a load shift product on the distribution system. A summary of findings from the day include:
 - CLECA's Critical Consumption Period (CPP) Pilot: is "informed" by the day ahead market pricing, when the nodal prices are negative, it would be dispatched over 1-6 hours, with a planned-for range of events to be set by the LSE, compatible with BIP, applicable to CPUC jurisdictional bundled, DA and CCA customers, an energy only product, settlement is based on a 10-in-10 baseline, and the CCP is intended to replace DBP.
 - In discussing the effectiveness of the evaluation framework as applied to the CCP product, the group discussed the challenges and opportunities the evaluation framework.
 - In discussing potential impacts a load shift product could have on the distribution system, the group discussed when a load shift product could help and harm the distribution system. The location, size, concentration, timing, duration and response speed will all factor in when considering the impact a load shift product will have on the distribution system.

- Meeting 9: September 17, 2018. At the September LSWG, the group heard two proposals on PDR enhanced: one was from CAISO on their Proxy Demand Response – Load Shift Resource (PDR-LSR) which was approved by the CAISO board on September 5th and one presentation was from CPower on enhancements they would recommend to CAISO's PDR-LSR resource. The LSWG also heard from RA experts from the CPUC and CAISO.
 - Jill Powers (CAISO) presented CAISO's PDR-LSR product which allows load consumption (charging, negative generation) and load curtailment (discharging, generation) only from directly-metered behind the meter (BTM) energy storage. The resource must register the product for load curtailment and load consumption capabilities through the use of two separate resource IDs. Load consumption is not eligible for RA and must bid a negative price. The resource must register an ID for load curtailment, but it is not required to bid curtailment, like PDR today curtailment is eligible for RA, and the bid price must be at or above the net benefits test price. Requires symmetry of bidding (i.e., if load increase is bid in 15-min intervals, load curtailment must also bid in 15-min intervals).
 - Jennifer Chamberlin presented a technology neutral (TN or TN-PDR-LSR) version of CAISO's PDR-LSR to the WG. Key differences from CAISO's approved PDR-LSR were that the product was:
 - Technology neutral;
 - Premise level;
 - Could use baselines approved in ESDER 2; and
 - Could use the hourly block intertie bidding option.
 - Michele Kito (CPUC) and Karl Meeusen (CAISO) presented a general level-setting on the original purpose of RA (including how it has evolved overtime).

C. Summary of Status of Working Group:

The status of the working group is arranged by issue topics and when it was introduced into the compliance report below:

April 2018	July, 2018	October, 2018
1. Technology Neutral	7. Safety and Reliability of the Distribution System	11. DR Goals and Principles Guiding the Development of a Load Shift Product
2. Energy Neutrality	8. Performance Evaluation Methodologies	12. Resource Adequacy
3. Market Integrated	9. Storage GHG Metric	13. Other Value of a Load Shift Product
4. Dispatch Granularity	10. Evaluation Criteria	
5. Issues Out of Scope		
6. Threshold Questions		

Compliance Report Date of Introduction: April, 2018

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 take. In contrast, CAISO's ESDER 3 initiative developed a load shift product for BTM storage.³

Majority/Minority Positions and Consensus/Non-Consensus Views: Majority: Technology neutrality is a priority. Non-consensus view is that some technologies' or resources' operating characteristics may be better suited than others to provide load shift, similar to today's load reduction demand response (DR).

Recommended Policy Changes from Parties: The load take product should be technology neutral.

Status of Issue: Open or Closed: Closed, April 2018.

Issue 2: Energy Neutrality

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

Background: An energy neutral product would mean that on a given interval (for market integration purposes, daily), total energy consumption ("take") would have an equivalent curtailment ("shed").

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

- Majority: Energy neutrality is not an important feature of the load take product as:
 - There may not be symmetry in what the grid needs in the belly (take) vs. the neck of the duck (shed). As the grid needs are 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, the LSWG will be limited in its ability to develop a product that is a viable CAISO alternative to the energy imbalance market (for real time export/energy transfers) or renewable curtailment. LBNL acknowledges that an exact match between load increase and load

³ CAISO Initiative Homepage: Energy Storage and Distributed Energy Resources:
https://www.caiso.com/informed/Pages/StakeholderProcesses/EnergyStorage_DistributedEnergyResources.aspx

decrease is unlikely in real world conditions, and that the choice of modeling shift as energy neutral in the *2025 California DR Potential Study*⁴ was a simplifying assumption.

- 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 fact that the load take product would still be subject to paying retail rates is a barrier to increasing consumption for the sole sake of compensation.
- **Minority: CESA:** Energy neutrality may be important as a means of ensuring “useful consumption” as consumed load is used to reduce load later (not necessarily symmetrical), which provides capacity and GHG benefits, whereas those benefits are not necessarily delivered through consumption decoupled from load shed.

Recommended Policy Changes from Parties: The DR new model product does not have to be energy neutral. Accordingly, it may be more aligned with the attributes of the product we are designing to refer to it as either “load take” or “load consumption”. This will both avoid confusion and reflect the fact that the design of the product will not require that total energy consumption would be followed by an equivalent amount of curtailment. All three products under consideration, are currently designed around the concept of load increase.

Status of Issue: Open or Closed: Closed, April 2018.

Issue 3: Market Integration

Issue Statement: What does it mean for the load take product to be a market integrated product and why does it matter?

Background: A key design objective of the Load Shift working group is to reduce renewable curtailment. As context, for 2018, approximately half of all curtailment has been attributable to system curtailment and half has been attributable to local curtailment of renewables.⁵

- A load increase product may reduce curtailment if it occurs when the marginal emissions are zero; in California, GHG emissions are largely correlated to price, and negative real-time pricing is indicative of zero marginal emissions as low or negative prices usually occur when renewable resources set the marginal price. Depending on the design and granularity of dispatch, a market integrated load increase product that may be able to mitigate both local and system curtailment.
- If integrated into the market when renewable curtailment is occurring, then any increase in load should result in reduced curtailment in the market model. Without integration into the market, the impact is less measurable and would be influenced by how the CAISO incorporates the load shift into their real-time load forecast; for example, as the real-time market constantly forecasts and adjusts for real-time schedule deviations, then the increased load should lead to reduced curtailment (albeit not necessarily in the first or second interval).
- The working group is exploring three paths to market integration including:
 - 1.) An enhanced version of CAISO’s PDR-LSR product (fully “market integrated” DR);
 - 2.) A product not CAISO integrated but influenced by wholesale market triggers (e.g., CLECA’s Critical Consumption Period Pilot, and Real Time Pricing); and
 - 3.) Market informed products that could influence load based on expected market outcomes (e.g., Pay for Load Shape, and Passive Load Shift)

⁴ CPUC DR Potential Study Materials, including the LBNL Study: <http://www.cpuc.ca.gov/General.aspx?id=10622>

⁵ http://www.caiso.com/Documents/Wind_SolarReal-TimeDispatchCurtailmentReportOct03_2018.pdf

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

- There is no majority position, or consensus to date, on preference for market integration (*e.g.*, whether it must be dispatchable in CAISO market or whether it is sufficient to be “informed” by CAISO market prices).
- Guidance from Energy Division is to think more broadly about DSM strategies for load shift that may be “market informed” rather than “market integrated” such as CLECA’s Critical Consumption Period Pilot, Real Time Pricing, Pay for Load Shape, and Passive Load Shift.

Recommended Policy Changes from Parties: None to date.

Status of Issue: Open or Closed Open. An ongoing discussion in the working group influenced by guidance from the CPUC and evolution of the three products described above.

Issue 4: Dispatch Granularity

Issue Statement: When considering the market integration of a load take product, what granularity of DR dispatch best meets grid needs?

Background: The granularity of DR dispatch impacts what market issues the dispatch can resolve.

- The location and level of dispatch granularity affects what level of curtailment and problem can be resolved. For example, if there is a local oversupply event happening in a load pocket in the north due to transmission constraints and a load shift resource that is dispatchable or targeted on a system basis is located in the south, it cannot relieve the oversupply condition. In addition, the increase in load in the south could have the negative effect of turning on generation in the south to serve the new increase in generation in that area. Ideally, you would need to have a resource that is able to increase load at the same node where the price is negative.
- Each of the products discussed to date have varying levels of dispatch granularity. Today, market integrated DR as PDR is dispatched based on the aggregated pricing node (APNODE) which can be defined as a single resource or an aggregation of resources (but can only be as large as a sub-LAPs boundaries). Other approaches could be targeted at a range of geographic levels, which is a key design consideration for future pilots and possible programs that would take these approaches.

Table 2: Granularity of Load Take Dispatch for Each Proposed Product

Product	Granularity of Load Take Dispatch		
	LSE DLAP (i.e., LSE service territory). Mitigates: a.) DLAP-wide curtailment b.) DLAP negative pricing To the extent there is no congestions, would be system-wide benefit.	APNODE Mitigates: a.) Local area/sub-lap curtailment b.) Local area negative pricing	Resource Level Mitigates: a.) Local area/sub-lap curtailment b.) Local area negative pricing
PDR		X	X
Informed by Wholesale Prices (CCP)	X	X	X
Load Bidding	X		
Pay for Load Shape	The granularity of these products would depend on the specifics of design. If the signals for these products (prices, target shapes, etc.) are defined in coarse terms, at the system level, then the main effects would be on reducing system-level curtailment with only coincidental effects at the local level (which may be offset by spurious load shifts in areas without local		
Real Time Pricing			

Passive Load Shift	constraints). If the signals are more granular and targeted for specific areas, it may be possible to alleviate both system and local constraints that lead to curtailment.
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Majority/Minority Positions and Consensus/Non-Consensus Views: N/A

Recommended Policy Changes from Parties: N/A

Status of Issue: Open. This is an operational attribute being discussed as a part of the criteria for the LSWG and tied to the value a load take product provides. It is an ongoing discussion item.

Issue 5: 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 to 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, April 2018.

Issue 6: Threshold Questions

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

Background: Initial meetings indicated there may be some issues that need to be addressed prior to moving forward with defining a load take product.

Majority/Minority Positions and Consensus/Non-Consensus Views: The majority position of the group is that there were threshold questions that warrant future sessions before creating the product definition of load take product(s).

- What do we mean by “CAISO integrated” when it comes to a requirement for this product?
 - Ongoing discussion
- What do we mean by dispatchability as it relates to this product?
 - Update: Addressed in Issue 4 “Dispatch Granularity”
- What is the value of this product to the grid?
 - Update: This Issue will now be updated to “Value of Load Take to the Grid”

Recommended Policy Changes from Parties: N/A

Status of Issue: Open or Closed: Open.

Compliance Report Date of Introduction: July, 2018

Issue 7: Safety and Reliability of the Distribution System

Issue Statement: How will we ensure that a load take DR product does not negatively impact the safety and reliability of the distribution system?

Background:

- The need for additional load consumption is typically during the spring months which is not a time of system stress, so in general there should not be a wide-spread problem with additional load on the distribution system.
- Due to the diverse and dynamic nature of the distribution system (compared to the transmission system) various levels of review and planning are required. DER participating in wholesale market (i.e., a market integrated product) are just one of the many 'asks' the distribution system must accommodate.
- If resources operate in a manner that is not consistent with how they have been studied by the Utility Distribution Company during the interconnection and distribution planning processes, there could be distribution level safety and reliability impacts.
- Any DER operating on the distribution system must have the following attributes considered when considering their impact to the distribution system: location, size, concentration, timing, duration and response speed.
- Additional safety and reliability problems could result if DER operators are unaware of circuit reconfigurations that affect their DERs (i.e., abnormal configurations).
- Distribution systems were designed to accommodate diverse loads while a load shift product is requiring participants to react in the same manner at same time and that could cause issues for distribution planners.
- While it is noted above that meeting distribution system needs is outside the scope for this group, a degree of controllability and/or visibility into the operations of load shift is required for distribution system operators. This is not the same as with load curtailment, since curtailment would tend to reduce loading on local circuits, while load take could lead to inadvertent overloading or unplanned upward step changes in loading.
- We also note that load taking could be a valuable resource for distribution system operations on circuits with high levels of distributed generation and constraints on back-feeding.

Majority/Minority Positions and Consensus/Non-Consensus Views: The Utility Distribution Company perspective is that processes to ensure resources are properly interconnected, studied, and later operated will be needed as it relates to a load take resource. Once a product is defined, the UDC will assess how this can be best studied for operation.

Recommended Policy Changes from Parties: The issue does not require further discussion in the working group, but distribution planners will be assessing the load shift product(s) impact on the grid once product(s) are developed and begin to be integrated.

Status of Issue: Closed.

Issue 8: Performance Evaluation Methodologies

Issue Statement: What baselines are most appropriate for a load take product?

Background: Baselines are used to determine typical use to assess what service was incremental for compensation. Baselines are a means of estimating what would have been used by a facility or device participating in a DR program if a DR event had not been called. Because it calculates normal energy usage, the baseline is the most important tool to measure participant's change in load during an event. FERC has summarized the need for accurate measurement and verification of DR baseline performance as⁶:

1. Providing accurate payments to DR resources leads to improved market efficiency at both the wholesale and retail level.
2. The ability to predict DR response at the individual and aggregate level improves operational efficiency for both wholesale and retail markets.
3. Measured DR performance is a key input to planning and designing retail programs (i.e., accurate cost-effectiveness assessments).
4. Meaningful measurement provides the basis for fair and transparent financial flows to and from market participants.

To date baselines have been researched and viewed from the perspective of load curtailment. The working group still has questions related to how baselines developed to date can be applied to a load take product.

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

- The working group has members with the perspective that the proposed ESDER 2 baselines can be applied to a load take product. (Olivine)
- The working group also has members with the perspective that there is not any evidence to prove that all baselines, including those developed in CAISO's ESDER 2 initiative, can be applied to a load take product and therefore research may be needed. (CAISO, PG&E)

Recommended Policy Changes from Parties: While there is no recommend policy position, there is general recognition that the themes discussed throughout baseline discussions warrant additional consideration. Many of these issues do not just affect baselines for load consumption but also load curtailment due to the changing nature of what resources are participating in demand response.

1. Frequent vs. Infrequent Dispatch

- **Background:** With new technologies such as batteries providing load response and the changes in needs on the grid from additional renewables, DR is moving from a product that is infrequently dispatched to resolve shortage of generation to additional DR products that can be dispatched more frequently to resolve excess generation or even meet flexibility need.
- **Questions:**
 - What constitutes frequent use?
 - Can baselines still capture incrementality with frequent use?
 - How robust are persistence (e.g., "10-in-10") and statistical baselines to frequent dispatch?

⁶ FERC. Measurement and Verification for Demand Response. Vii. <https://www.ferc.gov/industries/electric/indus-act/demand-response/dr-potential/napdr-mv.pdf>

2. Device vs. Premise Participation

- **Background:** For some load it may be beneficial to only have a device participate, for other load it may be beneficial to have the premise participate.
- **Question:**
 - How do we ensure the net grid impact is in a desired direction to support grid needs?
 - How do we design baselines so that either the device's participation in a DR event does not impact the settlement associated with the premise participating in DR or vice versa?

3. Retail and Wholesale Participation

- **Background:** There are both retail and wholesale DR settlement methods which may not be aligned.
 - i. **WHOLESALE:** The baseline is settled in aggregate for the performance of energy.
 - ii. **RETAIL:** Baseline is typically settled at the individual resource level for the performance of energy. In some cases such as PG&E's Capacity Bidding Program, the retail capacity is tied to an energy baseline.
- **Questions:**
 - How do we design programs that do not provide payment for the same capacity between retail and wholesale, or allow inappropriate arbitrage between wholesale and retail?
 - How do we design programs so that consumption in the wholesale side in response to an event on the retail side does not affect the baseline?

4. Participation in both TAKE and SHED services

- **Background:** With new models of DR you could have a resource that provides both TAKE and SHED services. For example, in ESDER 3, CAISO's PDR-LSR product allows a DR resource to provide take and shed services in different intervals.
- **Questions:**
 - How do we develop a baseline that does not introduce more bias in estimating the typical use when the resource provides TAKE and SHED services?
 - How can CAISO integrate a DR resource that provides TAKE and SHED that does not result in conflicting dispatch signals?
 - How should baselines account for incrementality of TAKE or SHED on days when both are provided?

5. Technology Impacts on a Baseline

- **Background:** Different technologies may have different abilities or characteristics that influence the development of a baseline.
- **Questions:**
 - How can we develop a baseline for storage so that its actions taken in previous intervals do not introduce bias into the baseline?
 - How can we develop a baseline for a device that can move (i.e. EVs can move from the EVSE charging station to the premise)? Should each device have its own baseline?

- How do we develop a baseline that assesses what happens in intervals before and after the event to understand if the resource is providing a response that benefits the grid?
- How should baselines adapt in the face of potential real-time prices in the future, which could lead to non-stationary load patterns for buildings with “smart” loads or controls?

Status of Issue: Open. There is agreement that baselines are necessary to determine what value the DR resource is providing. However, many of the baseline issues described above are not just applicable to a load take product but also applicable to DR for load curtailment. The topic of baselines is being discussed in CAISO’s ESDER 2 tariff implementation as a part of implementing new baselines and in CAISO’s ESDER 3 policy development for a load take product, and may warrant additional discussion in future DR meetings. SLAC is also conducting research on performance evaluation methodologies as it relates to the ESDER 2 baselines and DR that is frequently dispatched and increases load.

Issue 9: Storage GHG Emissions Metric

Issue Statement: How will the working group consider incorporating a GHG emissions metric for storage into the load take product?

Background: On May 15, 2018 the CPUC issued their Decision Modifying D. 16-09-056 which states in Ordering Paragraph 3 that, “The Load Shift Working Group established in Decision 17-10-017 should consider an energy storage emission metric for any storage related proposal.”

Majority/Minority Positions and Consensus/Non-Consensus Views: The majority position is:

- The working group is attempting to balance the objectives of designing a product that addresses changing grid needs, assists with renewable integration and does not increase GHG emissions.
- Energy storage is not inherently a clean or dirty technology, emissions are determined based on a.) the round-trip efficiency of the resource as it takes energy to keep the battery operating and b.) how the technology is operated and what the marginal generation unit is when it is participating in the wholesale market. The temporal aspect of GHG emissions applies to all load that participates in the load shift product, not just batteries.
- As GHG emissions in California are largely correlated to price, in general when prices are low or negative, it is because renewables are setting the marginal price. Accordingly, if the “take” only occurs when the marginal emissions are zero, there is no problem. The group acknowledges there are instances (perhaps fringe cases) in which a negative price could be during instances when the marginal emissions are above zero, as a result of: a gas fired resource bidding a negative price to remain online at its minimum power level (“Pmin”), the result of congestion pricing, the result of a virtual bid, instances of system oversupply due to a lack of downward ramp, a local oversupply in congestion due to a lack of downward ramp in a constrained area, among other possible scenarios. Similarly, “shed” is likely at high price times, when the high marginal prices are set by high cost thermal resources.
- The edge cases described above may lead to instances where an individual load shift event increases emissions, but the key driver for climate is aggregate emissions over time. Thus, the focus of the group effort is understanding the overall impact on emissions based on expected dispatch and operational patterns from load shift products, accounting for both the common and the edge cases.
- Per CLECA, if there is any increase in GHG emissions during a low or negative price event, then due to CA cap and trade program those emitting resources will have to purchase GHG

allowances from some other emission source. Therefore, the net impact on GHG emissions is zero.

Recommended Policy Changes from Parties:

- The working group is recommending that each product indicate how it could impact GHG emissions, specifically each proposal should answer:
 - Is the product CAISO market integrated?
 - For market integrated products, what is the likely timing and impact of non-dispatched “snap back” (the SHED that is the complement of the dispatched TAKE, and vice versa)? How will these overall GHG impacts be estimated or tracked?
 - Is the product only dispatched during negative pricing intervals?
 - If it is dispatched during non-negative pricing intervals, how will net GHG emissions impacts from the product be tracked and/or estimated?

Status of Issue: Open.

Issue 10: Evaluation Criteria

Issue Statement: How will the LSWG evaluate each product?

Background: October Compliance Report Update: The Load Shift Working Group developed an Evaluation Framework document for each product proposed to use to describe their product and its attributes. The document was presented at the August LSWG meeting and is currently “frozen” for updates. The Framework includes three sections:

1. A background section to describe the product
2. A product description to describe the attributes and details of the product
3. A product evaluation section to evaluation how the product could benefit the grid and be implemented

Majority/Minority Positions and Consensus/Non-Consensus Views: The working group has “frozen” the evaluation criteria so that participants developing the product are able to update their proposals.

Recommended Policy Changes from Parties: N/A.

Status of Issue: Closed, October 2018.

Compliance Report Date of Introduction: October, 2018

Issue 11: DR Goals and Principles Guiding the Development of a Load Shift Product

Issue Statement: What is the load shift resource optimizing for?

Background: D. 17-10-017 tasked the Load Shift Working Group with, “Defining and developing new products including load consumption and bi-directional products”. Throughout the working group, stakeholders have asked what the working group’s north star is (i.e., reducing local or system renewable curtailment, reducing greenhouse gas (GHG) emissions, market transformation, etc.). R. 13-09-011 stated the following goals and principles for all demand response programs:

Goals: *Commission-regulated demand response programs shall assist the State in meeting its environmental objectives, cost-effectively meet the needs of the grid, and enable customers to meet their energy needs at a reduced cost.*

Principles:

- *Demand response shall be flexible and reliable to support renewable integration and emission reductions;*
- *Demand response shall evolve to complement the continuous changing needs of the grid;*
- *Demand response customers shall have the right to provide demand response through a service provider of their choice and Utilities shall support their choice by eliminating barriers to data access;*
- *Demand response shall be implemented in coordination with rate design;*
- *Demand response processes shall be transparent; and*
- *Demand response shall be market-driven leading to a competitive, technology-neutral, open-market in California with a preference for services provided by third-parties through performance-based contracts at competitively determined prices, and dispatched pursuant to wholesale or distribution market instructions, superseded only for emergency grid conditions.*

Majority/Minority Positions and Consensus/Non-Consensus Views: Any Load Shift products should balance the goals and principals outlined in R.13-09-011 and the written report should highlight tradeoffs between these various goals and principles.

Recommended Policy Changes from Parties: N/A

Status of Issue: Open or Closed: Closed, October 2018.

Issue 12: Resource Adequacy Value

Issue Statement: What proposals will the LSWG make to the RA proceeding and why?

Background: The CPUC has tasked the working group to, “identify the value of new products to provide to the RA proceeding”

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

- The group agrees that as a load increase product alone does not help the grid have sufficient useable generation to meet peak demand when considering local RA or system RA. Today, load increase solves an economic problem (i.e., over supply of renewables) and does not address a reliability problem related to peak generation capacity, as a result any load take product would not qualify for system or local RA.
- As it relates to the duck curve, the group agrees that if a load take resource increases the belly of the duck without increasing the neck of the duck that it should be compensated for its ability to provide flex RA or reduce the need for other resources to provide flex RA.

Recommended Policy Changes from Parties: Under development, draft recommendations include:

- 1.) The Commission should consider unbundling flex RA from local and system RA requirements so that a load shift resource can provide flex RA.
- 2.) The Commission should consider the value when load shift reduces the flex need and should be compensated for it to account for this uncaptured value. In the case that the product is load modifying rather than market integrated, a process needs to be developed to integrate this into the CEC's load forecast.
- 3.) The Commission should consider what changes are needed more broadly to the RA program in light of generation moving to being predominantly provided by a combination of renewables and storage.

Status of Issue: Ongoing. The working group continues to discuss the possible RA value that a load shift product could provide.

Issue 13: Other Value of a Load Shift Product

Issue Statement: What non-RA benefits are there to the load shift product?

Background:

- There is consensus from the group that there is an energy value to the grid and available to the product, if it is market integrated or deemed integrated due to the direct link to market prices.
- The group has also questioned if current energy payments are enough to incent customers to participate in load shift behavior.

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

- Some stakeholders have discussed if there are externalities that are not covered by the full energy payment that should be incorporated into a payment such as:
 - Additional value for avoided curtailment;
 - Additional value for using power in state instead of exporting when it is economic through the CAISO's Energy Imbalance Market.

Recommended Policy Changes from Parties:

- The working group recommends the Commission provide guidance on what regulatory venue would be best to explore the value of the services identified.

Status of Issue: Ongoing.

D. Next Steps:

The working group currently has three remaining meetings scheduled: October 24, November 14, and December 12, 2018. The final quarterly compliance report will be due January 15, 2019 and the final report will be served on January 31, 2019.