SOUTHERN CALIFORNIA EDISON COMPANY’S
(U 338-E) TESTIMONY IN SUPPORT OF ITS
APPLICATION FOR APPROVAL OF ITS 2018 –
2022 DEMAND RESPONSE PROGRAMS:
VOLUME 1 - POLICY

Before the
Public Utilities Commission of the State of California

Rosemead, California
January 17, 2017
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I.

EXECUTIVE SUMMARY

In this application, Southern California Edison (SCE) submits its proposed comprehensive portfolio of existing models of Demand Response (DR) programs and activities for the period of 2018 through 2022.

A. Overview of SCE’s Funding Request for its DR Portfolio

This application is consistent with the direction and guidance provided by the California Public Utilities Commission (Commission or CPUC) in Decision (D.) 16-09-056 to focus on existing models of DR programs and activities and incorporates the full cost for program administration, including incentive costs previously determined in other regulatory proceedings. SCE’s application when adopted by the Commission will provide approximately $183 million in funding for its DR programs. SCE’s funding request aligns with the Commission’s direction in D. 16-09-056 that annual DR funding for the 2018-2022 period should not exceed the currently authorized 2017 DR funding levels (excluding funding for the Demand Response Auction Mechanism (DRAM) program)). SCE’s proposed funding of $183 million for the period 2018-2022 (excluding the DRAM pilot costs for 2018-2019, which were already approved in D. 16-06-029) results in an average of approximately $37 million for each year. This annual amount is well below the 2017 funding level limitation of $53 million. As such, SCE is seeking an average annual funding decrease of approximately $16 million for its DR portfolio for each year from 2018 through 2022. While the requested funding is lower, SCE commits to meet or exceed all DR goals with this funding level. This approach provides customers all of the benefits of the program while yielding significant annual savings for customers.

1 Acronyms and abbreviations are defined only the first time they are used in SCE-01, and are not re-defined in each volume. For a complete list of all acronyms and abbreviations used throughout all volumes of SCE’s direct testimony, please see SCE-01, Vol. 4, Appendix B.
B. **SCE’s Proposed DR Portfolio Builds on the Success and Leadership of its Existing Models of DR Programs and Activities**

SCE’s current DR portfolio reflects SCE’s continued leadership to deliver cost-effective DR programs that meet the needs of SCE’s distribution grid and allow customers to meet their energy needs and lower their energy costs. For 2016, SCE has approximately 670,000 service accounts (SA) enrolled in 12 different programs which resulted in over 1,300 megawatts (MW) of potential load reduction. These results were achieved in 2016 through consistent customer support, marketing and outreach efforts and responsible administration of the programs. SCE’s proposed portfolio builds on the successful approaches used in 2016. In 2018, SCE will continue its practice of proactive program administration, customer outreach and advocacy relative to DR programs in the California Independent System Operator (CAISO) wholesale market and responsible fiscal administration of the DR budget.

C. **SCE’s Proposed DR Portfolio is Consistent with the Commission’s Overarching Goal for Demand Response**

In D. 16-09-056, the Commission adopted an overarching goal that investor-owned utility (IOU)² DR Programs shall assist the State in meeting its environmental objectives, meet the needs of the grid and enable customers to meet their energy needs at a reduced cost. SCE’s DR portfolio proposed in this application achieves this overarching goal by meeting system and local resource needs with preferred resources while enabling eligible customers to meet their energy needs at reduced cost through program incentives that lower participating customers’ overall energy costs. SCE’s DR portfolio is cost-effective with a Total Resource Cost (TRC) result of 1.3.

D. **SCE Will Continue Its Leadership in CAISO Market DR Integration**

SCE has been a leader at DR integration since June 2015 when SCE integrated over 1,100 MW of its DR portfolio (approximately 90 percent of its DR resources) into the CAISO market. In two full seasons of operational experience with CAISO market integration of DR, SCE has observed several

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² The IOUs are SCE, Pacific Gas and Electric Company (PG&E), and San Diego Gas and Electric Company (SDG&E).
opportunities to improve DR market integration by better aligning Commission and CAISO rules. The
rules regarding the loss of RA value for DR that cannot be integrated could be detrimental to the value
of SCE’s portfolio in the future. If left unresolved, these issues represent barriers to effective DR
integration. SCE looks forward to working with the Commission, the CAISO and DR program
providers to resolve these issues and continue to promote DR.

E. **SCE’s Proposed DR Portfolio Supports Both Third-Party and IOU -Provided DR**

SCE’s DR portfolio is comprised of both third-party delivered DR programs and IOU delivered
programs. SCE supports third-party performance-based contracts, such as DRAM, and direct DR
provider participation in the CAISO market. SCE also supports the Commission’s finding that the
experience of the IOUs in delivering DR programs is important and should be maintained along with
third-party resources. As the Commission notes, both IOU and third-party delivered DR programs
subject to fair competition will result in greater customer choice.

F. **SCE’s DR Portfolio Reflects Continued Improvements to Streamline and Consolidate Its
DR Portfolio**

SCE’s 2017 DR portfolio contains several DR portfolio program improvements that have
allowed SCE to meet or exceed all DR goals, while reducing funding by an average of over $33 million
from the 2015 and 2016 annual average authorized amounts. The improvements include updates to its
legacy DR programs that will continue to facilitate market integration, comply with tariffs and increase
customer satisfaction. For its 2018 through 2022 proposed DR portfolio, SCE recommends additional
improvements that will further streamline its DR portfolio resulting in an additional average annual
budget reduction of $16 million from the 2017 authorized amount. For example, SCE recommends
reexamining the reliability cap to address administrative issues that can arise when multiple DR
providers may be registering reliability DR resources in the market. SCE also recommends changes to
DR integration rules and elimination of underutilized performance reports. Finally, SCE recommends
consolidation of the DR and energy efficiency (EE) funding authorizations. SCE recommends that
Demand Side Management (DSM) goals should be determined in the Integrated Resource Planning
proceeding, and that resulting DSM program funding be requested in a combined proceeding. Such a
combination will allow for greater visibility in resource tradeoffs, consistency in resource planning, and flexibility in funding.
II.

INTRODUCTION AND SUMMARY OF TESTIMONY

Exhibit SCE-01 (Volumes 1, 2, 3, and 4) supports SCE’s proposals for its DR activities and required funding for the period 2018 through 2022 consistent with the DR goal and principles in D. 16-09-056 (Guidance Decision). Volume 1 of this Exhibit describes how SCE has incorporated the Commission’s overarching DR goal into the proposed DR portfolio. Volume 2 of this Exhibit describes each of SCE’s existing DR programs including proposed program changes, incentive structures and funding, and the proposed program budget. Volume 3 sets forth the DR incentive determination process; DR program enrollment and load impact forecasts and DR portfolio cost-effectiveness analysis. Finally, Volume 4 presents appendices to SCE-01, including a table showing SCE’s full budget request for its 2018 – 2022 DR portfolio, a list of acronyms and abbreviations, and the qualifications of the Witnesses to SCE-01.

As shown in Table I-1, SCE is requesting $182.95 million in 2018 – 2022 for its portfolio of existing models of DR programs and activities, excluding DRAM funding and incentives. SCE’s annual average funding request is $36.6 million, or approximately 31 percent less than the budgets approved for 2017. In Ordering Paragraph (OP) 12 of D. 16-09-056, the Commission capped SCE’s annual DR portfolio expenditures for 2018 – 2022 at its 2017 authorized amount of $53.1 million (excludes authorized DRAM funding).

Appendix A contains the budget for the entire DR portfolio shown by each DR program.
This volume of SCE-01 consists of an Executive Summary of SCE’s application and supporting testimony (Chapter I), and three additional chapters. This Chapter (Chapter II) sets forth the organization of Exhibit SCE-01 and summarizes SCE’s funding request for 2018 through 2022 for its DR portfolio of existing models of DR programs and activities. Chapter III describes SCE’s implementation of the Commission’s DR goals and principles as enunciated in the Guidance Decision into SCE’s 2018 – 2022 proposed portfolio of existing programs. Specifically, Chapter III describes how SCE is incorporating the Commission’s guidance on the role of market participants into the DR portfolio and also describes SCE’s efforts to continually improve, streamline and consolidate the DR portfolio. Chapter IV provides SCE’s experience with integrating DR into the CAISO market and identifies certain barriers to CAISO market integration. Chapter IV also identifies SCE’s recommendations to improve DR integration into the CAISO market.

### Table II-1

**SCE: 2018-2022 Proposed Demand Response Program & Forecast Budgets**

<table>
<thead>
<tr>
<th>Category</th>
<th>2018 Budget</th>
<th>2019 Budget</th>
<th>2020 Budget</th>
<th>2021 Budget</th>
<th>2022 Budget</th>
<th>Total Budget Request</th>
<th>2017 Total Authorized Budget</th>
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<td>$783,074</td>
<td>$822,841</td>
<td>$838,390</td>
<td>$858,829</td>
<td>$5,468,239</td>
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<tr>
<td>Category 2 - Price Responsive Programs</td>
<td>$9,036,951</td>
<td>$9,198,192</td>
<td>$9,391,919</td>
<td>$9,485,857</td>
<td>$9,668,939</td>
<td>$46,781,858</td>
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<td>Category 3 - DR Aggregator Managed Programs</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$17,325,000</td>
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<tr>
<td>Category 4 - Emerging &amp; Enabling Technologies</td>
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<td>$15,065,136</td>
<td>$15,196,183</td>
<td>$15,262,059</td>
<td>$15,360,866</td>
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<tr>
<td>Category 5 - Pilots</td>
<td>$170,670</td>
<td>$259,284</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$429,953</td>
<td>$1,000,000</td>
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<tr>
<td>Category 6 - Evaluation, Measurement &amp; Verification</td>
<td>$1,323,064</td>
<td>$1,313,316</td>
<td>$1,352,715</td>
<td>$1,393,297</td>
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<td>Category 7 - Other Local Marketing</td>
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<td>$2,849,922</td>
<td>$2,865,941</td>
<td>$2,882,440</td>
<td>$14,336,950</td>
<td>$2,966,000</td>
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<td>Category 8 - System Support Activities</td>
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<td>$9,920,698</td>
<td>$4,328,150</td>
<td>$5,696,258</td>
<td>$4,437,376</td>
<td>$29,210,482</td>
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<tr>
<td>Category 9 - Integrated Programs and Activities</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
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<td>Category 10 - Special Projects</td>
<td>$-</td>
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<td>$-</td>
<td>$-</td>
<td>$-</td>
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<td>Category 11 - Dynamic Pricing</td>
<td>$-</td>
<td>$-</td>
<td>$-</td>
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<td>Total Requested in 2018-2022 Application</td>
<td>$39,438,429</td>
<td>$39,389,071</td>
<td>$33,941,731</td>
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<td>$34,643,546</td>
<td>$182,954,578</td>
<td>$182,954,578</td>
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III.

INCORPORATION OF COMMISSION GUIDANCE FOR THE 2018 – 2022 DR PORTFOLIO

The Guidance Decision outlined a set of expectations for the 2018 – 2022 DR Application. The purpose of this Chapter is to describe SCE’s incorporation of the Commission’s overarching DR goal and guidance into SCE’s DR portfolio. This Chapter also describes SCE’s efforts to continually improve, streamline and consolidate the DR portfolio.

A. Commission’s Goals and Guiding Principles for Demand Response

In the Guidance Decision, the Commission adopted an overarching goal for DR programs regulated by the Commission. Specifically, the Commission’s adopted DR goal states that “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.” SCE’s proposed 2018 – 2022 DR portfolio is aligned with each of the aspects of the adopted overarching goal. First, the design of SCE’s 2018 DR portfolio will support the State in attaining its environmental objectives by helping to meet system and local resource needs with preferred resources. Second, as shown in Volume 3 of this Exhibit, SCE’s 2018 – 2022 DR portfolio has a TRC value of 1.3, which is considered a cost-effective DR portfolio. Finally, as demonstrated in Volume 2 of this Exhibit, SCE’s DR programs enable eligible customers to meet their energy needs at reduced cost through the use of program incentives which lower the participating customers’ overall energy costs.

The Guidance Decision also provided the following set of principles for all Commission-regulated DR programs: (1) DR shall be flexible and reliable to support renewable integration and emission reductions; (2) DR shall evolve to complement the continuous changing needs of the grid; (3) DR customers shall have the right to receive DR products through a service provider of their choice and the Utilities shall support their choice by eliminating barriers to data access; (4) DR shall be implemented in coordination with rate design; (5) DR processes shall be transparent; and (6) DR shall be

D.16-09-056, OP 7 at p. 97.
market-driven leading to a competitive, technology-neutral, open market in California. SCE has incorporated these principles to develop a robust portfolio of DR programs that achieve the Commission’s overarching DR goal at a cost that is below SCE’s authorized 2017 DR funding.

The Guidance Decision directed that for this application the Utilities should only address current models of DR programs for the years 2018 through 2022. The Guidance Decision also directed the IOUs to continue implementing program improvements and the requirements from previous decisions in the DR Rulemaking (R.) 13-09-011. Specifically, the Commission required that the IOUs continue efforts to (1) address technical or policy barriers to direct participation of DR in the CAISO market and (2) consolidate DR programs and tariffs with the DR program incentives so as to implement DR programs in coordination with rate design. Additionally, the Guidance Decision required that the IOUs’ 2018 – 2022 Applications must not exceed the 2017 authorized DR funding amounts. SCE’s proposed funding request for 2018 – 2022 is consistent with this proposal. Finally, the Commission directed the Utilities to calculate the cost-effectiveness of each program using the Commission-adopted 2015 DR Cost-effectiveness Protocols (Protocols) and the Renewable Electricity Capacity Planning (RECAP) methodology as the interim Availability or “A” Factor. SCE’s Application complies with each of these requirements as demonstrated in Volume 3 of this Exhibit.

B. Roles of Market Participants

1. Utility-Delivered Programs

In the Guidance Decision, the Commission discussed the important role of the IOUs in the development of DR programs over the past three decades. The Commission supported a continued IOU presence in this area through IOU-tariffed programs, in addition to DR opportunities for customers via third-party contracts with the IOUs. SCE appreciates the recognition of the important IOU experience

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5 D.16-09-056, OP 8 at pp. 97-98.
6 D.16-09-056, pp. 70-71.
7 D.16-09-056, OP 14 at p. 100.
8 D.16-09-056, pp. 55-56.
in providing DR. SCE recognizes the importance that its DR programs have, both in the CAISO energy markets and for local reliability purposes for SCE as a distribution grid operator. Consistent with the Commission’s findings in D. 16-09-056, having Utility delivered programs results in greater opportunities for customer choice in meeting their energy needs.

Recently, Lawrence Berkeley National Laboratory (LBNL) released the results of its Phase II DR Potential Study identifying four types of DR: *shed, shape, shift and shimmy*. Each type of DR represents a different value proposition, and no single type should be put above the others, or discredited for lack of flexibility. Customers are the “fuel” for DR resources and their capabilities vary greatly depending on their segment (e.g., business vs. residential), their investment capabilities and access to capital infrastructure (e.g., battery-backed DR vs. manual load control), and the underlying process onsite (e.g., industrial processing vs. retail sales vs. general office space). All of these factors combined, with attention to customer needs, will narrow the DR product type and program fit on a customer-by-customer basis. There may be many customers who fit into a shimmy or shift-type product category, but the underlying MW totals may not be large. Likewise, there is a much smaller number of large industrial customers who represent large MW loads who are only capable of the traditional shed type activities.

Some market participants find that the future of DR in the California energy grid lies with shift and shimmy-type DR resources as being fast-responding, two-way, dynamic and capable of offering

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2 LBNL, “Final Report on Phase 2 Results, 2015 California Demand Response Potential Study: Charting California’s Demand Response Future,” November 14, 2016, available at http://www.cpuc.ca.gov/General.aspx?id=10622 [as of January 17, 2017], excerpt from pages 1-1, 1-2. “*Shape* captures DR that reshapes customer load profiles through price response or on behavioral campaigns—“load-modifying DR”—with advance notice of months to days. *Shift* represents DR that encourages the movement of energy consumption from times of high demand to times of day when there is surplus of renewable generation. Shift could smooth net load ramps associated with daily patterns of solar energy generation. *Shed* describes loads that can be curtailed to provide peak capacity and support the system in emergency or contingency events—at the statewide level, in local areas of high load, and on the distribution system, with a range in dispatch advance notice times. *Shimmy* involves using loads to dynamically adjust demand on the system to alleviate short-run ramps and disturbances at timescales ranging from seconds up to an hour.”
ancillary services.\textsuperscript{10} However, the shed resources offered via IOU tariffs are also an important tool in the DR toolkit. These programs allow large customers to participate in DR programs, and when called upon, they are able to drop hundreds of MW of load in less than 30 minutes.\textsuperscript{11} The legacy DR shed programs also allow large customers to manage their energy bills and provide an important incentive for these businesses to remain in California. SCE is committed to serving its customers and offering products that provide grid support. Legacy DR Programs that are classified as shed accomplish both of these goals.

As new models of DR (e.g. shift and shimmy) are developed over time, SCE believes these products will become more viable as market rules develop with sufficient revenue streams to support such resources. Over the next two years, SCE anticipates developing new DR products/programs intended specifically for the CAISO wholesale market with an emphasis on fast, flexible, technology-enabled and customer-friendly characteristics.

2. Third-Party Delivered Programs

SCE supports the Commission’s principle of market-driven DR characterized by competition between the IOUs and third parties according to customer choice and preference. Third-party providers have enabled technology for DR programs and can often respond quickly (in some cases almost instantaneously) to DR dispatch instructions. Because of this important characteristic, third-party


\textit{“The Shimmy service type represents “Fast” DR and includes what is often referred to as ancillary services (AS), which support the continuous flow of energy through the grid to meet demand. In other words, this service corrects the real-time, continual gap between predicted (and therefore dispatched) demand and actual demand. This gap can be from either too much or too little predicted demand, and therefore Shimmy resources must be able to both take and shed load on a short timescale. We estimate DR potential for two types of Shimmy service: (1) load following, where the resource follows a five-minute dispatch signal, and (2) regulation, where the resource follows a four-second dispatch signal. Shimmy DR supports the grid by reducing the need for generation units to provide this service.”}

providers are important and uniquely positioned to participate in the CAISO energy market in both the real-time and day-ahead markets.

Further, SCE supports the DRAM Pilot and recognizes that third-party aggregators have made strides in adapting to the DRAM procurement paradigm and better understanding the different facets of the CAISO market in order to integrate their resources. Should DRAM successfully transition from a pilot to an on-going program, SCE anticipates that third parties will focus on the DRAM to meet the 1,000 MW procurement goal set by the Commission. If the DRAM Pilot does not result in an on-going program, then SCE expects third parties to pursue participation in existing aggregator DR programs such as the Capacity Bidding Program (CBP). SCE has been working diligently on improvements to its CBP program in order to attract more third-party participation to this energy-based DR program that is integrated into the CAISO market.

C. **Continuous Improvement, Streamlining and Consolidation in the DR Portfolio**

The Commission has instructed SCE to improve, streamline, and consolidate its DR portfolio, continuing the progress made in its 2017 DR filing.\(^{12}\) SCE has taken the following actions and makes the following proposals.

1. **Consolidation of DR Incentives**

As directed by the Commission,\(^ {13}\) SCE has incorporated DR program incentives in this proceeding. The DR incentives were previously determined and requested in Phase 2 of the General Rate Case (GRC) proceeding. In this proceeding, SCE used the DR incentive calculation method that is consistent with the method SCE used to calculate the same incentives in the GRC Phase 2 proceeding. Specifically, SCE used an avoided capacity, or “A times B” method. The cost-effectiveness method approved by the Commission and used in this Exhibit also uses the “A times B” method. However, because each calculation is meant to serve a different purpose, the application of the method differs

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\(^ {12}\) See D.16-09-056, pp. 63, 67.

\(^ {13}\) D.16-06-029, OP 22, p. 92.
between the incentive determination and the cost-effectiveness determination. These calculations and
the results are described in more detail in Volume 3 of this Exhibit.

2. **Consolidation of DSM Funding Authorizations**

The Commission’s guidance for this application advances its goal of consolidating DR issues
into one regulatory vehicle to aid in greater oversight and consistency. Similarly, SCE recommends that
the Commission consider consolidating DSM planning and funding. SCE recommends that DSM
goals should be determined in the Integrated Resource Planning proceeding, and that resulting DSM
program funding be requested in a combined proceeding. Such a consolidation allows for resource
tradeoffs, consistency in resource planning, and flexibility in funding. SCE recommends that the
Commission develop a record on the topic and consider making this change so that it can be in effect at
the beginning of 2018, which coincides with the start of the new EE Business Plan period and the 2018-
2022 DR funding period. SCE recommends that a workshop be held as part of this proceeding with all
interested stakeholders to develop a consolidated DSM planning and funding proposal for Commission
consideration and adoption.

3. **Requests for Changes to DR Integration Rules**

As shown in Chapter IV below, as of August 2016 SCE had approximately 145 MW of DR
resources that have not been integrated into the CAISO market due to CAISO resource size restrictions
or SCE internal operational processes and system limitations. As additional market rules and
restrictions come into play, SCE is concerned that any DR program MW that cannot be cost-efficiently
integrated into the market will no longer count either toward SCE’s RA obligation (Supply Side
counting) or toward lowering peak demand (Load Modifying counting). As SCE cannot remove
customers from a program because their DR load happens to fall into a load group/resource that cannot
be integrated (because it is too small), SCE seeks to make sure that all DR resources provide sufficient

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14 DSM consists of DR, EE, and Distributed Generation (DG).
value to all customers by allowing these resources to be counted as either Supply Side (integrated) or Load Modifying (peak reduction).

In addition to the known challenges, there are pending discussions and proceedings at the CAISO which, if finalized in their current forms, would pose challenges to the continued integration of some existing DR programs. For example, as discussed below, resources that cannot respond within 20 minutes of being dispatched (“slow-start DR”) are in jeopardy of not receiving Local RA credit. The CAISO is hosting discussions on how best to treat these resources and use them in their markets. The current discussion is focused on ‘pre-dispatch’ of the resources, which is akin to a ‘trigger.’ Imposing any artificial trigger on the resource would dispatch the resource more often than it was designed or intended to be called; SCE is concerned that if these resources are called more frequently, it would adversely affect customer participation and customer satisfaction.

Similarly, in the CAISO’s Regional Resource Adequacy (RA) proposal, the CAISO is suggesting reliability resources be subject to testing twice per year to ensure they can demonstrate their capacity, because absent any testing, a reliability resource would not be able to demonstrate their capacity in the form of energy if they are not dispatched. While testing is necessary, SCE already tests a resource a minimum of once a year if the resource was not called for a reliability event. SCE has received feedback from its large industrial processing and manufacturing customers and understands that when an event is called (either for reliability or for testing purposes), these customers are faced with substantial economic loss that can greatly reduce the benefits of being in the DR program. Specifically, a customer may be in the middle of processing a product and if it is required to shut down, the product run may need to be discarded because the shutdown has interrupted an assembly line (of coating, sealing, etc.). In addition, these customers have informed SCE that it may take anywhere from three hours to a full business day to get their assembly lines and processing operations restarted. CAISO’s proposal to increase testing could unnecessarily double the amount of dispatches for the Base Interruptible Program (BIP). SCE is concerned that if these customers are called more frequently, they will drop out of the program because the costs to their businesses would begin to outweigh the compensation received.
In order to preserve the value of DR resources and the continued participation by customers, SCE may determine that it is necessary to seek Commission input and guidance before the mid-cycle review in 2020 if the CAISO proceedings continue to propose insurmountable challenges to the continued integration of some existing DR programs. Ultimately, it may make sense to move some resources from Supply Side to Load Modifying in cases where the CAISO integration is not feasible or economically efficient.

4. Cap on Reliability DR

Under the settlement agreement approved in D.10-06-034, reliability DR is capped at 2 percent of the CAISO all-time peak demand. This cap is apportioned to the three IOUs, and provides a limit on how much reliability-based DR can be counted toward meeting the RA obligation. SCE’s present portion of the reliability cap is 659 MW, and any MW above that cap would not be eligible for RA counting if the overall statewide cap of 2 percent is exceeded. SCE’s current reliability DR is approximately 625 MW; based on expressed interest in the aggregated BIP option, SCE expects to reach or exceed the cap shortly.

a) Managing the Reliability Cap across Third Parties and Multiple LSEs Poses a Challenge

As part of the 2017 DRAM, Sellers can use reliability DR (registered as a Reliability Demand Response Resource (RDRR)) to deliver contracted capacity – and in some cases may not specify which type of DR is used to deliver contracted capacity. Recognizing this as an issue, the proposed 2018 DRAM protocols and pro-forma provide clarity on which type of product (Proxy Demand Resource (PDR) or RDRR) the Seller will use to deliver capacity, and clarify that the IOUs may assign zero capacity value to bids that would result in going above the reliability cap. While a “first-come, first-served” approach to receiving capacity value is reasonable, it would create several administrative questions. For example, if a certain bid is deemed above the reliability cap, would it be placed on a wait list?

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\footnote{The Seller can bid a PDR or an RDRR product into the 2018 DRAM auction. If the PDR bid is accepted, the Seller is obligated to provide an economic resource, and cannot substitute it with an RDRR.}
list for capacity counting? What happens to DRAM contracts if subsequent years’ Load Impact studies suddenly put the portfolio over the cap?\textsuperscript{16}

b) The Commission Should Re-Examine the Reliability Cap

Consistent with the settlement agreement adopted in D. 10-06-034, the Commission may reconsider the two percent cap in a formal proceeding, such as the DR or RA OIR. While SCE does not have a specific proposal for an updated percentage level at this time, SCE recommends reconsidering whether an increase in the reliability DR cap is warranted.

5. Reevaluation of DR Budget Categories

In 2009 the Commission established the DR budget categories used to organize the IOUs’ DR budgets and to refine rules for shifting funds between DR categories.\textsuperscript{17} The Commission subsequently directed the IOUs to organize their 2012-2014 DR funding applications by these categories.\textsuperscript{18} In the past seven years, DR has changed significantly, but the DR budget categories have not changed and should now be modified to reflect these changes. Using outdated budget categories that no longer fit current DR portfolios leads to budgetary confusion and loss of flexibility in shifting funds. For instance, several DR funding categories no longer exist in the DR application. These include DR Category 3: Aggregator Programs, as the Aggregator Managed Portfolio (AMP) will be discontinued after 2017, Budget Category 9: IDSM, includes funding that is requested and approved in the EE proceeding, and Budget Category 10: Dynamic Pricing, is requested and approved in SCE’s General Rate Case proceeding. SCE proposes to remove these budget categories for the 2018 – 2022 funding cycle.

SCE also recommends categorizing programs and budgets consistent with the respective bifurcated resource. SCE proposes to categorize programs and budgets as follows:

- Budget Category 1 – Supply-Side Demand Response Program

\textsuperscript{16} E.g., if a current IOU program is deemed to count for 10 MW more, resulting in total reliability DR being 10 MW above the cap, which program would then lose 10 MW worth of counting?

\textsuperscript{17} D.09-08-027, Table 24-1, pp. 198-200.

• Budget Category 2 – Load Modifying Demand Response Programs
• Budget Category 3 – Demand Response Auction Mechanism (DRAM)
• Budget Category 4 – Emerging and Enabling Technology Programs
• Budget Category 5 – Pilots
• Budget Category 6 – Marketing, Education, and Outreach
• Budget Category 7 – Portfolio Support (includes EM&V and Systems & Notifications)

Therefore, SCE recommends the Commission undertake a review of the DR budget categories and provide guidance on how DR fund-shifting rules should apply in the future. SCE recommends this process inform the IOUs’ next DR applications for new models of DR for the years 2020 – 2022.

6. Request to Eliminate Reporting

In OP 13 of D.13-07-003 the Commission required SCE to submit a Weekly Demand Response report (Weekly Report). The Weekly Report contains expected load impacts for DR programs using an average hourly load reduction for each day. This report is sent each Monday before noon for every week throughout the year. In the time since this requirement was established, SCE has integrated the majority of its programs into the CAISO market. Once a program is integrated, it is removed from the Weekly Report because CAISO has visibility to the MW from SCE’s bids. In addition, the applicable MW associated with load modifying, or non-integrated, programs that have customers that dual participate in integrated DR programs are removed from the total in the Weekly Report. This has left the Weekly Report nearly empty, and only Peak Time Rebate (PTR) remains. SCE expects its PTR-Emerging Technologies-Direct Load Control (PTR-ET-DLC) program to be integrated into the wholesale market in 2018, at which point there will be nothing left for the required report.

OP 13 of D.13-07-003 also requires SCE to submit Daily Reports, which are sent every morning, including weekends, during the peak season (May 1st – October 31st). The Daily Report contains greater detail, compared to the Weekly Report, in which SCE provides hourly load impacts for each individual program in SCE’s DR portfolio. The Daily Report serves the same purpose as the Weekly Report, but with more detail.
In discussions with the CAISO and the CPUC, the Weekly Report is not utilized by either party. SCE has contacted the distribution list for the Weekly Report and has received no objection to eliminating the Weekly Report. SCE requests that the Weekly Report be eliminated upon approval of this application. In addition, SCE proposes that the Commission adopt the recommendation submitted in the Load Modifying Working Group Compliance Report which proposes changes to the Daily Reports.\[^{10}\]

IV.

INTEGRATION WITH THE CAISO MARKET

The purpose of this chapter is to describe SCE’s experience and current efforts at integrating its DR programs in the CAISO market. This chapter also identifies certain barriers to further integration and makes recommendations to overcome those barriers.

A. Resource Bifurcation

This section discusses SCE’s ongoing effort towards DR resource bifurcation and greater integration into the CAISO wholesale energy market, which the Commission has been considering since 2008, when it instructed California’s IOUs to file applications presenting plans for integrating DR programs into the CAISO market. In D.15-11-042, the Commission ordered that event-based DR resources not integrated into the CAISO market by January 1, 2018 would cease to have capacity value, providing an incentive for these resources to integrate more quickly.20

Despite the many challenges SCE has experienced with the integration of legacy DR resources into the marketplace, currently, SCE has successfully integrated more than 1,000 MW of DR resources into the market. SCE was the first utility to integrate its complete DR portfolio and began bidding its legacy DR programs into the CAISO wholesale market in June 2015 with the integration of the following five DR programs: (1) CBP; (2) AMP; (3) BIP; (4) Agricultural & Pumping Interruptible (AP-I) Program; and (5) Summer Discount Plan (SDP). The integration of these programs resulted in a total of 70 PDRs21 and RDRRs.22 As of August 2016, 75 PDRs and RDRRs were integrated representing approximately 1,033 MW, or about 88 percent, of the five programs totaling 1,178 MW that SCE has

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20 See D.15-11-042, p. 8. In lieu of being integrated into the CAISO market, a DR resource can also receive capacity value by being embedded in the California Energy Commission’s (CEC) unmanaged/base case load forecasts.

21 A PDR is a product created to allow DR participation in the CAISO markets by facilitating the integration of economic retail DR programs that can be dispatched based on economic signals.

22 An RDRR is a product created to further increase demand response participation in the CAISO markets by facilitating the integration of existing emergency-triggered retail DR programs and newly configured DR resources that have reliability triggers and desire to be dispatched only under certain system conditions. RDRRs cannot participate in ancillary services markets.
integrated. Table IV-2 below illustrates the registered and non-registered MW for integrated programs. The remaining 145 MW could not be registered for various reasons as described in this section. SCE considers these programs fully integrated into the CAISO market for the purposes of DR program dispatch because whenever the CAISO selects an SCE bid, the entire program is dispatched, not just the integrated portion. However, per D.15-11-042, these DR “crumbs” are not considered integrated, and may not receive RA credit for the 2018 RA compliance year and beyond.

As part of its integration efforts, SCE registered at least one resource from each Load Control Group (LCG) in all five programs. Thus, a CAISO award of any integrated resource always results in SCE’s dispatch of all customers in the corresponding LCG. The only exception is the CBP Day Ahead (DA) 2-6 product, which did not meet the CAISO’s 100 kW minimum bidding requirement for registration in the CAISO market. Because CBP DA 2-6 is not registered as a resource in the CAISO wholesale market, it is dispatched in conjunction with the corresponding CBP DA 1-4 LCGs based on the CAISO awards for the integrated CBP DA 1-4 PDRs.

All five DR programs continue to be partially integrated programs. At this time, 85 resources representing 4 MW have not been registered because they do not meet CAISO’s minimum PDR or RDRR size requirement. In addition, SCE has not registered another 88 resources (representing 141 MW) that are large enough to be integrated. SCE is currently unable to integrate these resources because of the operational complexity of bidding a large number of DR resources into the CAISO market. This large number of resources could be reduced if the CAISO relaxes its rules that require resources to be defined per Sub Load Aggregation Point (SLAP) and per LSE. SCE plans to work with

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23 An LCG is the lowest level of dispatch granularity for SCE DR programs and it typically consists of more than one DR resource (whether registered in the CAISO market or not) because there is no segregation of customers by Load-Serving Entity (LSE) as is the requirement by CAISO for PDRs and RDRRs.


25 Id.

26 Per CAISO Tariff, each registered PDR has to be at least 0.1 MW, and each RDRR has to be at least 0.5 MW (per LSE, per SLAP).
the CAISO and other stakeholders to explore solutions that would allow the integration of additional DR capacity. This objective will be the main focus of SCE’s 2017 and 2018 integration efforts.

The following table provides a breakdown of DR MW that are registered as PDRs and RDRRs and those that are not registered but dispatched alongside the registered resources:

Table IV-2

Registered vs. Non-Registered MW
(As of August 2016)

<table>
<thead>
<tr>
<th></th>
<th>Registered MW</th>
<th>Non-Registered MW</th>
<th>Total MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBP1-4</td>
<td>3.6</td>
<td>6.8</td>
<td>10.5</td>
</tr>
<tr>
<td>CBP2-6</td>
<td>0.0</td>
<td>6.1</td>
<td>6.1</td>
</tr>
<tr>
<td>AMP</td>
<td>64.0</td>
<td>54.1</td>
<td>118.1</td>
</tr>
<tr>
<td>BIP</td>
<td>623.9</td>
<td>74.4</td>
<td>698.3</td>
</tr>
<tr>
<td>API</td>
<td>56.1</td>
<td>0.4</td>
<td>56.5</td>
</tr>
<tr>
<td>SDP</td>
<td>285.3</td>
<td>3.0</td>
<td>288.3</td>
</tr>
<tr>
<td>Total</td>
<td>1,032.9</td>
<td>144.9</td>
<td>1,177.8</td>
</tr>
</tbody>
</table>

Since initial integration in the Summer of 2015, there have been several registration updates of SCE’s PDRs and RDRRs. These updates accounted for customers migrating in and out of SCE’s programs and the impact that the migrating customers had on the capacities of the resources. For example, two CBP resources needed to be unregistered from SCE’s portfolio to release some SAs to a third-party demand response provider (DRP) participating in the DRAM pilot. The remaining SAs were re-registered to resume bidding in the market.

In addition, one AMP resource in the Central SLAP was un-registered in early 2016 to allow SCE to divide the resource into smaller resources. Per CAISO rules, a resource that is greater than 10 MW must provide telemetry. SCE determined that the installation of telemetry devices at all of the SAs was not cost-effective. Because SCE’s telemetry waiver from the CAISO was set to expire, SCE decided to divide the resources into six new AMP resources and re-registered them so that the resources could continue to participate in the CAISO wholesale market.

B. Improved Participation in the CAISO Markets

SCE continues to work diligently with the CAISO and other stakeholders to improve DR participation in the CAISO markets. This includes several efforts such as: supporting the testing and
deployment of the CAISO’s new Demand Response Registration System (DRRS); working with the Baselines Analysis Working Group (BAWG) to develop and adopt new and improved baselines for DR resources; working with the Load Consumption Working Group (LCWG) to develop a proposal for a load consumption DR product; coordinating with the CAISO to redefine the SLAP boundaries; troubleshooting and working with the CAISO to resolve market awards settlement issues; participating in the Commitment Costs Enhancements Phase 3 (CCE3) initiative to clarify and improve bidding and participation rules for DR as a Use-Limited Resource (ULR); and working with the CAISO to clarify the local capacity counting rules for resources that cannot meet the 20-minute response time (i.e. “slow-DR” resources).

1. **Demand Response Registration System Development and Deployment**

On November 30, 2016, the CAISO deployed the new DRRS, which significantly improves the DR resource registration process and reduces the time lag of resources that are capable and available to participate in the market but were off-line during the registration approval processes. The new system provides several other improvements, including the ability to end-date resources automatically. Although the resource registration process is not immediate, DRRS streamlines the resource registration process and allows for the automation of many steps which were previously conducted manually. Subsequent to CAISO deployment of DRRS, SCE deployed upgrades to its internal systems in December 2016 that take advantage of the new capabilities of DRRS.

2. **Baselines Analysis Working Group (BAWG)**

As part of the CAISO Energy Storage and Distributed Energy Resources (ESDER) Phase 2 initiative, SCE has been working with stakeholders in two separate working groups: the BAWG described here, and the LCWG described in the next section. The BAWG, led by SCE and SDG&E, has focused on exploring additional baseline methods to assess the performance of a DR resource when application of the current 10-in-10 baseline method is insufficiently accurate. SCE’s settlements show

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27 The DRRS replaced the old Demand Response System (DRS) starting December 2016.
that the 10-in-10 baseline method significantly underestimates the resource performance of its SDP resources. This underestimation results from the baseline using the average of historical meter data of the most recent, non-event similar day. Since heat waves rarely span more than a few days, the baseline is underestimated because of the earlier, cooler days in the baseline calculation. The BAWG performed analyses testing the accuracy of a variety of baseline methods and has developed several recommendations. The BAWG is developing a control group methodology whereby a subset of customers is used to estimate the performance of the whole resource. Subject to the outcome of these efforts, SCE will incorporate some of these new baseline methodologies for settlement of its existing DR programs once they have been approved and implemented by the CAISO. SCE will include the costs of these enhancements in its 2020 mid-cycle review.

3. Load Consumption Working Group (LCWG)

The LCWG has developed an initial proposal exploring the ability for PDRs to increase load consumption based on a CAISO dispatch and recommending modifications to the PDR design to allow bidirectional modelling and bidding of economic DR resources. The current draft proposal accommodates load consumption, and assumes that such resources and bidding would fall under current Federal Energy Regulatory Commission (FERC)/CAISO jurisdiction. The draft proposal identifies issues that must be addressed and identifies a path to minimize operational and regulatory challenges; namely, it assumes that the resource would be “non-exporting” and would use an “inverse” baseline to measure additional consumption.

SCE will stay engaged in this process and work with the CAISO and the stakeholders to develop load-consumption products that enables new demand response resources to address grid needs and deliver value to customers.

4. SLAP Boundaries Alignment

The CAISO has published a new Full Network Model (FNM) that updates the definition of the SLAPs to better align them with the physical transmission and distribution assets and current Local RA area definitions. This update will allow SCE and other market participants to identify DR resource locations such that each PDR or RDRR will be fully contained inside or outside of a Local RA
Area. In SCE’s case, each registered PDR or RDRR would now be in LA Basin, Big Creek/Ventura, or outside of a Local RA area.

5. **CAISO Settlements**

Since it integrated its DR resources in 2015, SCE has observed that the wholesale settlement statements from the CAISO contained several errors and did not accurately reflect the processes that were outlined in their Business Process Manuals (BPM), user guides, and tariff. For example, SCE observed that the resource settlements did not capture the correct event hours in calculating the baseline, the statements did not accurately specify the performance and meter data billing determinants for some resources, and the DRS did not calculate settlements for some event days. These problems eventually led to some resources not being compensated. SCE engaged in monthly meetings with the CAISO settlements teams and most of the issues have been resolved in the new DRRS. Corrections are expected to be made on future settlements statements.

6. **CCE3 Initiative**

In its CCE3 Initiative, the CAISO put forth proposals regarding the treatment of, and qualification for, ULRs that directly affect DR. In discussing how the proposals affect DR qualification for ULRs, SCE identified several issues related to market rules for bidding PDR and RDRR in the wholesale market. SCE described the difficulties in properly including the DR opportunity costs in market energy bids, and the need to represent the DR use limitations. SCE also described the associated opportunity costs through a mix of energy bids, startup and minimum load costs, and other limitations. As a result of stakeholder workshop discussions and comments, the CAISO has issued an Action Plan\(^2^8\) that proposes to solve many of the issues, including continued exemption from bid insertion and mitigation, Resource Adequacy Availability Incentive Mechanism (RAAIM) exemption for a transition period, clarifications on ULR status application process, and calculation of PDR opportunity costs.

However, several issues still remain unaddressed, including the RAAIM treatment of weather-sensitive resources and the lack of opportunity cost bidding for RDRR in the Day-Ahead market. The RDRR opportunity cost bidding issue is significant as the bulk of SCE’s programs, such as SDP and BIP, are integrated as RDRRs.

7. **Local Capacity Counting**

In 2015, the CAISO proposed a BPM change to clarify that local RA energy-limited resources must be capable of 20-minute dispatch post-contingency to count toward meeting local capacity requirements. The proposal was further refined to allow resources with sufficient “pre-dispatch” energy to count toward meeting local capacity requirements. Therefore, per current CAISO rules, in order to count for meeting local capacity requirements, a DR resource must have: 1) ability to dispatch within 20 minutes, or 2) sufficient availability for pre-dispatch. The meaning of each qualification option is still somewhat uncertain. For example, it is unclear if the 20-minute response time is based on nominal program terms (e.g. BIP-15 fully qualifies, BIP-30 does not at all), or on actual program performance (i.e. MW expected to be delivered within 20 minutes). Additionally, the “sufficient” pre-dispatch quantity has not yet been clarified by the CAISO.

This BPM change was appealed by several parties, including the Commission. As a result, the CAISO executive appeals committee deferred implementation and directed the CAISO staff to conduct technical studies to define energy requirements of pre-contingency dispatch resources to meet local RA requirements. SCE, CAISO, and other stakeholders are currently working on this study as part of the CAISO’s Transmission Planning Process. The study results will provide guidance on how “slow-start” DR resources will count toward meeting local capacity requirements.

SCE recommends that the 20-minute response requirement be further clarified. While the CAISO has adopted this requirement, the Commission has not formally adopted a similar requirement in its RA proceeding. SCE looks forward to discussing this issue in the RA proceeding, and working with the Commission and the CAISO to develop reasonable and coordinated requirements that reflect the value of DR resources to grid reliability.
8. **5-minute and 15-minute Meter Reads**

While there is still uncertainty regarding each qualification option for the local capacity counting discussed above, SCE is preparing for the strictest enforcement of the requirements. The 15-minute metering does not allow SCE to measure, at a granular level, exactly how much load is delivered within 20 minutes from the time that SCE receives notification from the CAISO to initiate an event. Current system limitations mean that, depending on when a signal is received, there can be as much as a 14-minute delay in recording load drop, which complicates compliance tracking. Additionally, the CAISO has proposed stricter auditing, testing and verification requirements for DR resources in its Draft Proposal for Regional RA,\(^{29}\) which make the granular meter data critical to demonstrating compliance in the future. For these reasons, SCE is proposing to update its customer meter read capability to record 5-minute interval data for non-residential DR programs where the customer controls their load drop and/or which are subject to a Firm Service Level (FSL) (e.g. BIP and AP-I). The change will allow more granular load drop to be measured with respect to the 20-minute CAISO requirement. SCE’s residential programs currently use meter data read at hourly intervals under waivers from the CAISO. SCE is proposing to reprogram its CAISO integrated residential meters from 60-minute intervals to 15-minute intervals. More information on the system changes and costs required to effectuate these changes are explained in Volume 2 of this Exhibit.

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