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BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Continue Implementation and Administration, and Consider Further Development, of California Renewables Portfolio Standard Program.	Rulemaking 15-02-020 (Filed February 26, 2015)

SOUTHERN CALIFORNIA EDISON COMPANY'S (U 338-E) 2016 RENEWABLES PORTFOLIO STANDARD PROCUREMENT PLAN

VOLUME 1

PUBLIC VERSION

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Dated: August 8, 2016

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Pursuant to Assigned Commissioner and Assigned Administrative Law Judge's Ruling Identifying Issues and Schedule of Review for 2016 Renewables Portfolio Standard ("RPS") Procurement Plans, dated May 17, 2016 ("ACR"), and the E-Mail Ruling Granting, in Part, IOUs[1] Request for an Extension of Time to Produce the 2016 RPS Procurement Plans, dated June 8, 2016, Southern California Edison Company ("SCE") respectfully submits its 2016 Renewables Portfolio Standard ("RPS") Procurement Plan ("2016 RPS Plan") to the California Public Utilities Commission ("Commission" or "CPUC").[2]

SCE's 2016 RPS Plan consists of a 2016 Written Plan and Appendices thereto.[3] The Appendices include:

- Confidential/Public Appendix A - Redline of 2016 Written Plan
- Confidential/Public Appendix B - Project Development Status Update

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1 The IOUs are the Investor Owned Utilities, which include Pacific Gas and Electric Company ("PG&E"), Southern California Edison Company ("SCE"), and San Diego Gas & Electric Company ("SDG&E").

2 SCE is concurrently filing a Motion for Leave to File its Confidential 2016 Renewables Portfolio Standard Procurement Plan Under Seal.

3 SCE worked with Pacific Gas and Electric Company and San Diego Gas & Electric Company to make the format of the utilities' plans as uniform as possible.

- Confidential/Public Appendix C.1 - Physical Renewable Net Short Calculations Based on CPUC Assumptions
- Confidential/Public Appendix C.2 - Physical Renewable Net Short Calculations Based on SCE Assumptions
- Confidential Appendix C.3 - Optimized Renewable Net Short Calculations Based on CPUC Assumptions
- Confidential Appendix C.4 - Optimized Renewable Net Short Calculations Based on SCE Assumptions
- Confidential/Public Appendix D - Cost Quantification Table
- Public Appendix E - RECs From Expiring Contracts
- Public Appendix F.1 - 2016 Procurement Protocol
- Public Appendix F.2 - Redline of 2016 Procurement Protocol
- Public Appendix G.1 - 2016 *Pro Forma* Renewable Power Purchase Agreement
- Public Appendix G.2 - Redline of 2016 *Pro Forma* Renewable Power Purchase Agreement
- Public Appendix H.1 - SCE's Least-Cost Best-Fit Methodology
- Public Appendix H.2 - Redline of SCE's Least-Cost Best-Fit Methodology

Respectfully submitted,

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Dated: August 8, 2016

VERIFICATION

I am a Director in the Energy Policy Organization of Southern California Edison Company and am authorized to make this verification on its behalf. I have read the foregoing SOUTHERN CALIFORNIA EDISON COMPANY'S (U 338-E) 2016 RENEWABLES PORTFOLIO STANDARD PROCUREMENT PLAN. I am informed and believe that the matters stated in the foregoing pleading are true.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this **5th day of August, 2016**, at Rosemead, California.

/s/ Gary Stern

By: Gary Stern

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(U 338-E)

2016 Written Plan

August 8, 2016

PUBLIC VERSION

2016 Written Plan

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I.

EXECUTIVE SUMMARY OF 2016 RPS PLAN

In accordance with the Assigned Commissioner and Assigned Administrative Law Judge's Ruling Identifying Issues and Schedule of Review for 2016 Renewables Portfolio Standard ("RPS") Procurement Plans, dated May 17, 2016 ("ACR"), and the E-Mail Ruling Granting, in Part, IOUs[1] Request for an Extension of Time to Produce the 2016 RPS Procurement Plans, dated June 8, 2016, Southern California Edison Company's ("SCE's") 2016 RPS Procurement Plan ("2016 RPS Plan") details SCE's plan for satisfying the State's RPS goals in a manner that minimizes costs and maximizes value for SCE's customers.

This 2016 RPS Plan discusses SCE's renewables portfolio, the process SCE uses for forecasting its renewable procurement need, SCE's forecasted renewable procurement position through 2030, SCE's portfolio optimization strategy and management of its renewables portfolio, lessons learned from SCE's experience with renewable procurement, past and future trends, and additional policy and procurement issues. Additionally, SCE explains its plans for achieving California's RPS targets, and discusses SCE possibly conducting a 2016 RPS solicitation. SCE's 2016 RPS Plan includes its 2016 Procurement Protocol and 2016 *Pro Forma* Renewable Power Purchase Agreement, a description of SCE's least-cost best-fit ("LCBF") evaluation methodology, including consideration of workforce development and disadvantaged communities, and a summary of the important changes from SCE's 2015 RPS solicitation documents.

Further, this 2016 RPS Plan addresses other issues set forth in the ACR, statute, and other California Public Utilities Commission ("Commission" or "CPUC") decisions. Specifically, SCE's 2016 RPS Plan includes discussion of the following additional topics:

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[1] The IOUs are the Investor Owned Utilities, which include Pacific Gas and Electric Company ("PG&E"), Southern California Edison Company ("SCE"), and San Diego Gas & Electric Company ("SDG&E").

- Project development status update;
- Potential compliance delays and risks;
- Quantitative information discussing SCE's renewable compliance;
- Minimum margin of procurement;
- Consideration of price adjustment mechanisms;
- Economic curtailment;
- California Tree Mortality Emergency Proclamation;
- Expiring contracts;
- Cost quantification tables;
- Imperial Valley issues;
- Safety considerations;
- Standard Contract Option using the streamlined Renewable Auction Mechanism ("RAM") procurement tool;
- Green Tariff Shared Renewables ("GTSR") program, in particular the Community Renewables program; and
- Other RPS planning considerations and issues.

SCE takes the RPS program's regulatory framework into account in planning for possible renewable procurement in 2016 and beyond. Senate Bill ("SB") 2 (1x), which took effect on December 10, 2011, increased the overall target percentage of procurement from renewable resources from 20% to 33%, and departed from the prior structure of annual RPS goals and moved to multi-year compliance periods, with interim procurement targets established for each multi-year compliance period. The Commission has issued several decisions implementing SB 2

(1x), including Decision ("D.") 11-12-020 setting RPS procurement quantity requirements,[2] D.11-12-052 implementing the three portfolio content categories of renewable energy products that may be used to satisfy RPS targets,[3] D.12-06-038 establishing new compliance rules for the RPS program, and D.14-12-023 setting enforcement rules for the RPS program. The Commission has not yet established a cost limitation for RPS-related procurement expenditures for each electrical corporation.

On October 7, 2015, Governor Brown signed SB 350 which, among other significant changes to the RPS program, increases the State's RPS goals to 50% by 2030. The Commission has not yet issued a decision on the implementation of SB 350's higher RPS targets and other changes to the RPS program. However, SCE has included SB 350's higher RPS targets in this 2016 RPS Plan assuming that the Commission will use the same methodology adopted in D.11-12-020 to set interim RPS targets.

SCE's renewable procurement planning may change as a result of the Commission's implementation of SB 350's changes to the RPS program, adoption of a procurement expenditure limitation mechanism, or other changes to the RPS program.

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2 As implemented by the Commission in D.11-12-020, pp. 2-3, the RPS procurement quantity requirements applicable to all retail sellers are as follows: (1) 20% of overall retail sales for the first compliance period from 2011-2013; (2) 21.7% of 2014 retail sales, plus 23.3% of 2015 retail sales, plus 25% of 2016 retail sales for the second compliance period from 2014-2016; (3) 27% of 2017 retail sales, plus 29% of 2018 retail sales, plus 31% of 2019 retail sales, plus 33% of 2020 retail sales for the third compliance period from 2017-2020; and (4) 33% of retail sales in each year thereafter.

3 The first portfolio content category ("Category 1") includes products from renewable generators with a first point of interconnection to the Western Electricity Coordinating Council ("WECC") transmission system within the boundaries of a California Balancing Authority Area ("CBA"), or with a first point of interconnection with the electricity distribution system used to serve end users within the boundaries of a CBA, or where the renewable generation is dynamically transferred to a CBA, or scheduled into a CBA on an hourly basis without substituting electricity from another source. The second portfolio content category ("Category 2") includes firmed and shaped products. The third portfolio content category ("Category 3") includes all other renewable electricity products, including unbundled renewable energy credits ("RECs"). Retail sellers are subject to a minimum portfolio content category target (varying by compliance period) for Category 1 products and a maximum portfolio content category target (varying by compliance period) for Category 3 products. The remainder may be satisfied by Category 2 products.

SCE's analysis of its renewable procurement need is discussed herein. SCE does not have a need for renewable energy at this time to satisfy its RPS program targets. In this 2016 RPS Plan, SCE proposes to hold open the possibility of conducting a targeted 2016 RPS solicitation that would include both a Community Renewables solicitation and a limited solicitation to purchase renewable energy. The purpose of any RPS solicitation SCE may hold would be to reinforce SCE's commitment to clean resources, to consider compelling offers, to solicit resources that meet local reliability need in the Western Los Angeles Basin ("Western LA Basin") or the Goleta area of Santa Barbara County, and to demonstrate support for State environmental policy. Also, if SCE conducts a 2016 RPS solicitation, it may include a solicitation of offers for SCE to sell Renewable Energy Credits ("RECs") of 2016-2020 vintage to allow SCE to optimize its renewables portfolio. Finally, if SCE decides to hold a 2016 RPS solicitation, one of its two required Community Renewables solicitations will be part of the 2016 RPS solicitation.

To the extent SCE conducts a 2016 RPS solicitation, SCE will use a solicitation process that is intended to capitalize on the maturing renewables market and target the most viable proposals that fit SCE's reliability need and provide the most value to customers. In order to submit a proposal, SCE will require that projects have: (1) a Phase II Interconnection Study (or an equivalent or more advanced interconnection status or exemption), unless the resource is located in the Western LA Basin[4] or the Goleta area,[5] which have a compelling local reliability need; and (2) an "application deemed complete" (or equivalent) status within the applicable land use entitlement process. Because of uncertainty surrounding SCE's long-term load forecast due to potential changes in its load profile (i.e., the effects of electric transportation, local solar

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4 In D.16-05-053, the Commission found that SCE still needed to procure 169.4 megawatts ("MW") of preferred resources in the Western LA Basin as part of the local capacity resource need that SCE attempted to fill as part of its Local Capacity Requirements Request for Offers ("LCR RFO").

5 SCE has a significant need for new generation to fill local capacity need in the Goleta area which has insufficient transmission and generation to support continued electric service during a significant emergency event, like a wildfire or mud slide.

photovoltaic ("PV") generation, and departing load), if SCE conducts a 2016 solicitation, SCE will request that all bidders submit one offer for a term of 10 years or less for each project. SCE will also solicit Category 1 products only. Additionally, SCE will only consider proposals from projects with initial delivery dates to SCE of January 1, 2021 or later, unless the resource is located in the Western LA Basin or the Goleta area where there is a demonstrated local reliability need.

If SCE holds a 2016 RPS solicitation, SCE will also request offers from parties interested in purchasing Category 1 or 3 products from SCE. SCE does not forecast a net short position potential until 2023. Therefore, in order to maximize value for customers, SCE may sell vintage 2016 through 2020 Category 1 or 3 products if purchasers present reasonably priced offers. SCE would not sell Category 1 or 3 products if doing so would compromise SCE's renewable position.

II.

ASSESSMENT OF RPS PORTFOLIO SUPPLIES AND DEMAND

A. SCE's Renewables Portfolio

For the first compliance period from 2011 through 2013, SCE served 20.7% of its retail sales from RPS-eligible resources.[6] In 2014, SCE served 23.4% of its retail sales from RPS--eligible resources. In 2015, SCE served 24.3% of its retail sales from RPS-eligible resources.

To date, SCE's RPS-eligible deliveries and executed renewable procurement contracts have resulted from SCE's RPS solicitations, SCE's Renewables Standard Contract program, the Assembly Bill 1969 feed-in tariffs, RAM auctions, the Renewable Market Adjusting Tariff ("ReMAT"), the utility-owned generation and independent power producer ("IPP") portions of SCE's Solar Photovoltaic Program ("SPVP"), the GTSR program,[7] SCE's Preferred Resources

6 SCE retired RECs amounting to 20.6% of its retail sales for the first compliance period.

7 Only RECs associated with unsubscribed GTSR energy deliveries may be used for SCE's RPS compliance. *See* D.15-01-051 at pp. 43-44; Ordering Paragraph 12.

Pilot ("PRP") program, qualifying facility ("QF") contracts, utility-owned small hydro projects, and bilateral opportunities.

SCE is presently initiating actions pursuant to the California Tree Mortality Emergency Proclamation ("Proclamation") issued by Governor Brown on October 30, 2015, as discussed in Section XI below. Those actions are implementation of: (1) the Tree Mortality RAM ("BioRAM") solicitation seeking 20 megawatts ("MW") of capacity from biomass facilities burning trees from High Hazard Zones ("HHZ") for wildfires; and (2) implementation of the Bioenergy Market Adjusting Tariff ("BioMAT") seeking power from small (3 MW or smaller) biomass facilities burning trees from HHZ. Any procurement resulting from BioRAM and/or BioMAT will also be RPS-eligible deliveries.

Between January 2014 and December 2015, SCE executed 26 RAM contracts for approximately 409 MW, 14 ReMAT contracts for approximately 27 MW, 41 SPVP IPP contracts for approximately 64 MW, one GTSR contract for 20 MW, two PRP contracts for 2 MW, and three QF standard offer contracts for approximately 38 MW.[8] During this period, SCE also executed:

- 8 contracts for approximately 1,556 MW from its 2013 RPS solicitation;
- one bilateral contract for 132 MW;
- one sales agreement for 2016 deliveries; and
- 18 contracts for approximately 2,096 MW from its 2014 RPS solicitation.

SCE launched its 2015 RPS solicitation on January 29, 2016 and has executed one RPS contract with a contract capacity of 128 MW and two GTSR contracts with a total combined contract capacity of 40 MW. SCE is still actively negotiating contracts for renewable energy [redacted] from that solicitation.

[8] Of these, six of the RAM contracts totaling 98 MW, four of the ReMAT contracts totaling 5 MW, and eleven of the SPVP IPP contracts for 16 MW subsequently terminated. This information is up to date as of June 30, 2016.

B. SCE's Forecast of Renewable Procurement Need

SCE determines its expected renewable procurement need by comparing its forecasted RPS targets to its forecasted energy deliveries from contracted projects. The forecasted energy deliveries include SCE's probabilistic risk-adjusted forecast of generation from contracted projects that are not yet online. SCE also considers generation from pre-approved procurement programs (i.e., ReMAT, BioMAT), among other factors.

Appendices C.1 through C.4 include SCE's forecast of its renewable procurement position and need – i.e., SCE's renewable net short ("RNS") – based on the RPS targets adopted by the Commission in D.11-12-020 for all years through 2020. Because of the new 50% by 2030 target established in SB 350, Appendices C.1 through C.4 also include a 50% target for 2030 and use the same methodology adopted by the Commission in D.11-12-020 to set targets for 2021 through 2030.

These Appendices use the standardized reporting template included in the Administrative Law Judge's Ruling on Renewable Net Short, R.11-05-005, dated May 21, 2014 ("RNS Ruling").[9] As required in the Revised Energy Division Staff Methodology for Calculating the Renewable Net Short ("Revised RNS Methodology") attached to the RNS Ruling, Appendices C.1 and C.2 include physical RNS calculations. Appendices C.3 and C.4 include optimized RNS calculations.[10] Appendices C.1 and C.3 include physical and optimized RNS calculations using all required assumptions for the Commission's Revised RNS Methodology. Appendices C.2 and C.4 include physical and optimized RNS calculations using SCE's assumptions. More information regarding Appendices C.1 through C.4 and responses to the RNS questions set forth in the RNS Ruling are included in Section VI.

All forecasts include projects under contract and assume contracted projects that are currently online will deliver 100% of their expected amount of renewable energy. All forecasts

9 SCE's forecasts only extend through 2030; therefore, SCE's forecasted RNS information is only included through 2030.

10 The required information on RECs from expiring contracts is included in Appendix E.

also include generation from pre-approved procurement programs (i.e., ReMAT, BioMAT) at a 100% success rate before contracts are signed.[11] Additionally, all forecasts incorporate current expected online dates for all projects that are not yet online. SCE is in the process of completing its 2015 RPS solicitation.

Furthermore, all forecasts account for potential issues that could delay RPS compliance, project development status, minimum margin of procurement, and other potential risks through the use of SCE's probabilistic risk-adjusted success rates for energy deliveries from contracted projects that are not yet online. These probabilistic risk-adjusted success rates are intended to reflect a number of dynamic factors and are periodically adjusted based on new information. The forecasts include individual project-specific, risk-adjusted success rates for large, near-term projects and a flat 60% success rate for the remaining projects, which is based on these projects' overall weighted average success rate. The overall probabilistic risk-adjusted success rate for energy deliveries from SCE's portfolio of contracts with projects that are not yet online varies from around 89% for the second compliance period to approximately 79% in the third compliance period and approximately 74% thereafter.

Additionally, SCE adjusted its load and generation forecasts for RPS-eligible energy to remove customer load served under the Green Tariff portion of the GTSR program (called the "Green Rate" by SCE).[12] This is because RECs associated with the load served under the Green Rate do not count toward RPS compliance.[13] Green Rate subscriptions are incorporated into all forecasts assuming that 100% of current Green Rate subscriptions continue indefinitely.[14] At present, because dedicated resources procured to serve Green Rate customers have not yet begun

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11 After contracts from such programs are signed, they are risk-adjusted in the same manner as other projects with executed contracts that are not yet online.

12 No customers are presently being served under the Community Renewables Rate. As a result, SCE only counted Green Rate customers here.

13 *See* CAL. PUB. UTIL. CODE § 2833(s).

14 Because no customers are presently being served under the Community Renewables Rate, SCE did not make any assumptions about how many customers would be served, in the future, under the Community Renewables Rate.

service, SCE transferred other RPS-eligible generation from its Interim Green Rate Pool to serve Green Rate subscribers, until dedicated Green Rate resources are operational, as an offset to existing renewable generation. SCE also reduced its bundled retail sales forecast used to calculate its RPS goals by the amount of energy used to serve Green Rate customer load, as permitted by the GTSR program.[15]

The difference between the RNS forecasts using SCE's assumptions, as reflected in Appendices C.2 and C.4, and the Commission's assumptions, as reflected in Appendices C.1 and C.3, is that SCE uses its most recent bundled retail sales forecast for all years while the Commission's assumptions use SCE's most recent bundled retail sales forecast for 2016 through 2020 and 2025 through 2030, and the standardized planning assumptions that were used in the 2014 Long-Term Procurement Plan ("LTPP") for 2021 through 2024.[16] SCE uses its own bundled retail sales forecast for renewable procurement planning because it is SCE's best forecast of bundled retail sales.

As shown in Appendices C.1 through C.4, SCE's procurement quantity requirement for the first compliance period was approximately 44.8 billion kilowatt-hours ("kWh") and its RPS-eligible procurement was about 46.4 billion kWh. The net surplus, less non-bankable procurement, results in the net long position of around 1.6 billion kWh at the end of the first compliance period.

Appendices C.1 through C.4 also demonstrate that, using either SCE's or the Commission's assumptions, SCE forecasts a procurement quantity requirement for the second compliance period of approximately [redacted] kWh and RPS-eligible procurement of about 57.2 billion kWh. The net surplus, less non-bankable procurement, contributes to the cumulative net long position of around [redacted] kWh at the end of the second compliance period.

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15 CAL. PUB. UTIL. CODE § 2833(u).

16 The Revised RNS Methodology states that retail sellers can use their own forecasts for bundled retail sales for the first five years and should use the LTPP standardized planning assumptions thereafter. *See* RNS Ruling, Attachment A at p. 25. In Appendices C.1 and C.3, SCE uses its own bundled retail sales forecast for 2025 through 2030 because there is no LTPP forecast for those years.

Using either SCE's or the Commission's assumptions, SCE forecasts a procurement quantity requirement of approximately [redacted] kWh and RPS-eligible procurement of about 100.1 billion kWh for the third compliance period. The net surplus, less non-bankable procurement, contributes to the cumulative net long position of around [redacted] kWh at the end of the third compliance period.

SCE forecasts a net short position in later years under both SCE's assumptions and the Commission's assumptions. Under the 50% by 2030 target and using SCE's assumptions, SCE forecasts a net short position starting in 2023 without the use of bank (as shown in Appendix C.2) and a net short position starting in 2028 with the use of bank (as shown in Appendix C.4). Using the Commission's assumptions, SCE forecasts a net short position starting in 2022 without the use of bank (as shown in Appendix C.1) and a net short position starting in 2027 with the use of bank (as shown in Appendix C.3). Accordingly, SCE does not have a short-term renewable procurement need, but it does anticipate a longer term need for additional RPS-eligible energy.[17]

C. SCE's Plan for Achieving RPS Procurement Goals

Through its 2016-2017 RPS procurement activities, SCE intends to consider contracts for renewable energy that will help achieve the State's RPS goals, as well as provide needed energy to serve SCE's customers at rates competitive with the market. SCE's 2016-2017 RPS procurement activities will take into account: (1) the renewable energy procured through SCE's prior RPS solicitations, including the 2015 RPS solicitation, and other procurement mechanisms, (2) probabilistic risk adjustment of expected generation from executed contracts with projects that are not yet online, (3) future RPS solicitations and other procurement mechanisms that are

[17] This conclusion assumes no incremental departing load from Community Choice Aggregation ("CCA") development. City of Lancaster is the only CCA currently accounted for in SCE assumptions for departing load. SCE performs scenario analysis for departing load when making procurement decisions based on the best information available at that time. SCE shares this information with its Procurement Review Group ("PRG") including Energy Division.

expected to take place, (4) departing load uncertainty and (5) the cost of procuring renewable energy as compared to the cost of procuring in the market.

As discussed above, SCE does not have a need for renewable energy to meet its RPS targets at this time. However, SCE may conduct a targeted 2016 RPS solicitation for Category 1 product. If SCE does launch such a solicitation, SCE will only consider proposals from projects with initial delivery dates to SCE of January 1, 2021 or later, unless the resource is located in the Western LA Basin or the Goleta area. As in the 2014 and 2015 RPS solicitations, in order to fill its longer term need, SCE would be flexible in its contracting in the 2016 solicitation. For example, SCE may contract with a seller for energy deliveries beginning in 2021 or later but will provide the opportunity for sellers to sell power directly to the market or to a third party until the delivery term begins under the contract with SCE. Also, if SCE conducts a 2016 RPS solicitation, it may include a solicitation of offers for SCE to sell RECs of 2016-2020 vintage to allow SCE to optimize its renewables portfolio. Finally, if SCE decides to hold a 2016 RPS solicitation, one of the two required Community Renewables solicitations will be part of the 2016 RPS solicitation.

All of the procurement in SCE's current renewables portfolio is from contracts executed prior to June 1, 2010 or contracts for Category 1 products. SCE forecasts that it will meet its RPS targets primarily through long-term Category 1 products because they provided the most flexibility for SCE's customers. However, SCE's forecast may evolve in this regard based on the Commission's implementation of SB 350 and the treatment of shorter term contracts and banking rules.

SCE considers its RPS position in light of how long it takes to bring new projects online, SCE's forecasted position, and how many solicitations SCE anticipates being able to complete in order to meet SCE's compliance requirements. SCE then makes a pro rata allocation of SCE's need over the remaining anticipated solicitations. Additionally, SCE generally executes contracts for deliveries in excess of its renewable procurement need to account for the risk of project failure and other relevant risks. This pro rata strategy allows SCE to adjust to changes in

the RPS program, including the potential for increased RPS targets, and to respond to changes in load forecasts and/or expected generation from operating and previously contracted renewable resources.

SCE determines its need for resources with specific deliverability characteristics (such as peaking, dispatchable, baseload, firm, and as-available) through its LCBF analysis. SCE uses its LCBF methodology to compare project profiles, including duration of term, location, technology, online date, viability, deliverability, and price, to estimate the value of each project to SCE's customers and its relative value in comparison to other proposals using both quantitative and qualitative factors. SCE also considers resource diversity with respect to proposals featuring differing technologies, generation profiles, and fuel sources, and performs a qualitative appraisal of the various benefits and drawbacks of projects when considering over-generation and the duck curve.[18] This process ensures that the projects that provide the most value align with SCE's procurement needs. SCE's LCBF approach is described in more detail in Section VIII.B and Appendix H.1.

In addition to RPS solicitations, SCE will continue to utilize a variety of other procurement options to help meet the State's RPS targets, including ReMAT, BioMAT, BioRAM, local capacity requirements solicitations, all source solicitations, PRP, QF standard contracts, and bilateral negotiations for competitive renewable energy products.

Given SCE's long position in the near term, SCE may solicit offers from interested parties to purchase RECs or other renewable energy products from SCE, as part of any 2016 RPS solicitation that SCE may decide to hold. The RECs would be of 2016-2020 vintage.

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[18] The California Independent System Operator ("CAISO") describes the Duck Curve in Fast Facts at - http://www.caiso.com/Documents/FlexibleResourcesHelpRenewables_FastFacts.pdf. In essence, the CAISO points out that as intermittent resources, and particularly solar resources, have a larger role, there is more available generation at mid-day, thus reducing the demand for other generation resources. This is the belly of the duck. Once the sun goes down, there is a need for other quick-ramping resources to become available to serve the growing demand for other generation resources. This is the head of the duck.

Additionally, SCE may conduct a future solicitation or negotiate bilaterally to sell such products to maximize value to its customers and optimize its RPS portfolio.

D. SCE's Portfolio Optimization Strategy

The objective of SCE's renewables portfolio optimization strategy is to minimize costs to its customers while ensuring that RPS goals are met or exceeded. The first step in SCE's portfolio optimization strategy is developing a forecast of SCE's renewable procurement position and need, i.e., SCE's RNS. This includes a calculation of SCE's net position and SCE's bank. SCE carefully evaluates its renewable procurement need by assessing bundled retail sales, the performance and variability of existing generation, the likelihood new generation will achieve commercial operation, expected online dates, technology mix, expected curtailment, and the impact of pre-approved procurement programs, among other factors. Annual variability of existing resources can either increase or decrease SCE's need and bank from year-to-year. However, over longer periods of time, SCE expects generation levels to be relatively consistent.

SCE uses its LCBF methodology to evaluate renewable procurement opportunities as further described in Section VIII.B and Appendix H.1. The primary quantitative metric used for evaluating bundled renewable energy is Net Market Value ("NMV"). SCE also relies on a number of qualitative factors such as resource diversity and transmission area, among other factors, when evaluating proposals.

Because SCE's need assessment results in a long position, SCE may use sales of renewable energy products,[19] project deferrals, and solicitation deferrals (as it did by not holding a 2012 RPS solicitation) in order to reduce customer cost while aligning procurement with its

[19] SCE procures renewable energy in compliance with the preferred loading order and when it expects to have a renewable procurement need. SCE does not purchase RPS-eligible energy for the express purpose of selling it at a later date.

forecasted need. Additionally, SCE actively administers its renewable procurement contracts to manage customer cost.[20]

SCE evaluates various potential risks when considering whether to engage in sales of renewable energy products including the risk of not meeting its RPS targets.[21] This evaluation includes, without limitation, a calculation of SCE's renewable procurement position and RPS bank with a set of adverse assumptions. Among others, these assumptions include lower performance of existing resources than expected, lower risk-adjusted project success rates for contracted generation that is not yet online, and higher levels of curtailment than expected. SCE assesses its renewable procurement position with these adverse assumptions to ensure that, even in the worst case scenario, SCE would still expect to meet its RPS targets after making the sale. SCE's overall approach appropriately balances the risks and costs of selling renewable energy products with the risks and costs of maintaining an RPS bank.

Finally, SCE continues to analyze the effects of procurement of RPS-eligible resources on other procurement programs in order to consider portfolio impacts. The Commission and the California Independent System Operator ("CAISO") considered flexibility requirements in the Resource Adequacy ("RA") proceeding to help manage the intermittency created on the grid by certain renewable resources. The CAISO launched a stakeholder process to discuss new obligations for flexible capacity and how flexibility requirements will be allocated to load-serving entities. The adopted proposal for allocating flexibility requirements directly allocates the identified requirements based on the amount of intermittent generation contracted by the load-serving entity. This creates a direct link between RPS procurement and flexibility requirements as the amount of wind and solar resources in the portfolio impacts the magnitude of the flexibility requirement allocated to the load-serving entity. A portfolio-wide optimization

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20 Contract amendments have the potential to decrease contract prices or provide other benefits to customers.

21 SCE also considers statutory and regulatory restrictions on banking of excess procurement.

strategy will need to assess the composition of SCE's renewables portfolio, as resources such as geothermal and other baseload resources may potentially reduce flexibility requirements.

E. SCE's Management of its Renewables Portfolio

After SCE executes an RPS power purchase agreement ("PPA"), the PPA is managed by SCE's Energy Contracts Management group. Each PPA is assigned a contract manager who serves as the primary point of contact to address all obligations and milestones under the PPA. To the extent allowable, many PPAs will require some form of modification prior to attaining commercial operation. Modifications may include financing consents, updates to facility descriptions, amendments that reduce costs to the seller and/or SCE without increasing revenues, true-up of PPA milestones and timelines as interconnection and permitting information is updated, and other miscellaneous changes to accommodate adjustments during the project development process. Generally, PPAs require few modifications after attaining commercial operation. At this juncture in the contract lifecycle, contract administration efforts become more focused on monitoring the contractual performance and payment obligations. However, disputes, settlements, outages, changes to delivery obligations or other issues may arise and are also managed by the same contract managers.

In evaluating modifications or amendments to a PPA, SCE applies guidance from D.88-10-032. Although D.88-10-032 was enacted as a set of guidelines for the administration of QF contracts, SCE has been using it when administering all forms of PPAs. At a high level, D.88-10-032 gave the IOUs the option to determine whether to enter into an amendment with any counterparty.[22] In the event an amendment is elected, the IOU should negotiate in good faith.[23] The decision also provides that in response to requests for contract modifications, an IOU is to seek concessions that are commensurate with the change being sought.[24] The details of

[22] *See* D.88-10-032 at p. 16.
[23] *See id*. at Conclusion of Law 8.
[24] *See id.* at p. 16, Conclusions of Law 13-14.

D.88-10-032 provide further guidance to the IOUs to restrict modifications to PPAs with viable projects,[25] and reject modifications that would result in creating an essentially new project.[26]

As appropriate, SCE also considers the standards of review for PPA amendments set forth in D.14-11-042, including assessment of SCE's renewable procurement need, NMV, contract price, project viability, consistency with Commission decisions, and other required updated information.[27]

SCE seeks approval by the Commission of all PPA modifications either through its annual Energy Resource Recovery Account ("ERRA") application or through advice letters or applications, depending on the type of PPA and nature of the amendment, and based on guidance from Commission decisions regarding specific modifications to PPAs.[28]

F. Lessons Learned, Past and Future Trends, and Additional Policy/Procurement Issues

1. Lessons Learned and Past and Future Trends

SCE's experience in renewable contracting has enabled SCE to negotiate successfully and bring projects online with a variety of counterparties on a diverse array of technologies. SCE is committed to recognizing the unique characteristics of each situation and working toward balanced and mutually acceptable agreements. To this end, SCE continues to refine both its RPS solicitation process and its *pro forma* PPA as a result of lessons learned from SCE's extensive experience in contracting for renewable resources and working with developers. Over the course of the last several years, SCE has also incorporated or accounted for several trends in its renewable procurement planning and solicitation process. SCE discusses several of

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25 *See id*. at p. 17, Conclusion of Law 4, Appendix A at pp. 4-5.

26 *See id*. at p. 26, Conclusion of Law 17.

27 *See* D.14-11-042 at pp. 80-82. The standards of review do not apply to amendments that are minor or non-material. *See id.* at p. 80.

28 For example, the Commission has indicated specific IOU actions regarding amendments to certain terms in tariff-based agreements.

its important lessons learned and significant past and future trends below. Additionally, as SCE has noted in past RPS Procurement Plans, more stringent eligibility requirements, such as the requirement that projects have a Phase II Interconnection Study (or an equivalent or more advanced interconnection status or exemption) and an "application deemed complete" (or equivalent) status within the applicable land use entitlement process in order to submit a proposal, have resulted in higher viability project proposals. SCE intends to continue these requirements should SCE conduct a 2016 RPS solicitation for all projects, except those that are located in the Western LA Basin or Goleta area.

a) Possible Future Trend Toward Departing Load

Various parties have made statements in public forums, including in public comments in Commission proceedings,[29] about their interest and intention in developing a Community Choice Aggregation ("CCA") program in their local jurisdiction. These entities have the potential to represent a significant departure of load from SCE's bundled service. In addition, the City of Lancaster recently formed a CCA and most customers in the City of Lancaster departed utility bundled procurement service in SCE's service area. If future additional large departures were to come to fruition, they could have proportionally significant impacts on SCE's progress towards meeting its RPS compliance goals, reducing SCE's potential RPS need.

Departing load should not impact SCE's planned procurement activities unless and until new load-serving entities ("LSEs") formalize their departure through a Binding Notice of Intent ("BNI").[30] SCE has not received any BNIs for new CCAs since the City of

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[29] A.14-05-024, Comments of Marin Clean Energy, Sonoma Clean Power, The City of Lancaster, The City and County of San Francisco, The County of Los Angeles, Lean Energy US, Clean Coalition, and Communities for a better environment Comments on the Draft Workshop Report, p. 2, filed June 20, 2016.

[30] SCE Tariff Rules, Rule 23.2(A)(1).

Lancaster formed its CCA, and, therefore, is not altering its procurement plan at this time.[31] However, if such load departures materialize, SCE will consider how these departures impact its RPS compliance, including its need for additional resources.

Moreover, if a sufficiently large amount of SCE's current bundled service customers depart bundled service, SCE may be significantly over-procured to meet its RPS compliance goals. In this case, the existing Power Charge Indifference Adjustment ("PCIA") mechanism might be insufficient to protect the remaining bundled customers from rate impacts due to these departures and thus fail to meet the Commission standard of maintaining "bundled customer indifference."[32] If the existing PCIA is found to be insufficient to protect bundled service customers from rate impacts, the Commission should reconsider how to equitably and appropriately allocate the costs and benefits of RPS procurement performed on behalf of those customers among all customers, bundled and unbundled, in a future proceeding. The Commission should be prepared to make necessary changes to ensure that remaining bundled customers are indeed indifferent to departing load.[33]

Finally, as the potential for departures from bundled service increases, the Commission should consider the cost impacts of special purpose above-market, RPS procurement. Examples include: BioRAM, ReMAT, and BioMAT. Because only the IOUs undertake this procurement and only bundled service customers fund such programs, as customers depart from bundled service, the remaining bundled service customers will be disproportionately affected by the costs of these programs. To ensure equitable allocation of these costs, particularly as increases in departing load materialize, it will be important to develop a way to support necessary special purpose RPS programs without unfairly burdening bundled

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31 SCE performs scenario analysis for departing load when making procurement decisions based on the best information available at that time. SCE shares this information with its PRG, including Energy Division.

32 CAL. PUB. UTIL. CODE §§ 365.1, 366.

33 See, e.g. CAL. PUB. UTIL. CODE §366.2(d)(AB 117, 2002) requiring all customers to bear a fair share of utility procurement costs incurred on their behalf to avoid cost shifting.

service customers. SCE provides its significant proposed changes to its RPS Plan in Section XV below.

b) One Offer Must Have a Term Length of 10 Years or Less

If SCE conducts a 2016 RPS solicitation, SCE will allow bidders to propose terms of any length. However, SCE will require bidders to provide at least one proposal per project with a term length of 10 years or less. Given SCE's long RPS position and uncertainty regarding departing load, SCE prefers shorter delivery terms. Signing shorter term contracts now means that SCE's customers are not contractually bound to as many longer-term contracts. As a result, if SCE's bundled load decreases and concomitantly its renewable position becomes significantly longer, SCE's bundled customers would have to pay for fewer longer term renewable contracts. This is especially important given the possibility of CCA load departure. Also, renewable technologies are continuing to evolve and improve, and prices may continue to decline given the continued efficiencies bidders are receiving through their projects. Shorter terms allow SCE to better take advantage of these technological advances through quicker contract cycles. Finally, shorter-term contracts support the continued operation of existing RPS resources that may not be able to support longer-term (20 year) extensions.

SCE made a similar request in its original 2015 RPS Procurement Plan. The Commission denied this request in D.15-12-025 indicating that requiring projects to offer a 10-year PPA length would unnecessarily constrain the market.[34] SCE's 2015 RPS Procurement Plan showed that SCE had a need for new eligible renewable resources. In this 2016 RPS Procurement Plan, primarily due to a reduced load forecast and SCE's procurement from its 2015 RPS solicitation, SCE has no need for new eligible renewable resources. In addition, there is a possibility that SCE's need could be further reduced by more CCA formation in its service area. Since D.15-12-025 was issued, the City of Lancaster formed its CCA and departed utility

[34] D.15-12-025, pp. 95-96.

service. As a result, there is a greater value now for SCE to enter into shorter-term contracts. It will not constrain the market for project developers to offer 10-year contracts, as all developers will be competing on the same basis. In fact, it will expand the number of bids that SCE might consider because there will be more 10-year contracts for SCE to choose from.

2. Additional Policy/Procurement Issues

a) SCE Will Consider the Need for RPS Resources to Meet Local Reliability Need in the Western LA Basin and Goleta Areas

On February 13, 2013, the Commission issued D.13-02-015, the LTPP Track 1 decision, which authorized SCE to procure between 1,400 and 1,800 MW of electrical capacity in the Western Los Angeles sub-area of the Los Angeles basin local reliability area ("Western LA Basin") and 215 MW to 290 MW of electrical capacity in the Moorpark sub-area to meet local capacity requirements ("LCR") by 2021 due to the expected retirement of once-through cooling units. Pursuant to D.13-02-015, SCE was required to procure minimum amounts of gas-fired generation, preferred resources (including renewable resources), and energy storage in the Western LA Basin. There were no technology-specific requirements in the Moorpark sub-area. SCE commenced its LCR Request for Offers ("RFO") on September 12, 2013. The LCR RFO was open to all technologies that could meet SCE's LCR needs, including renewable resources.

On March 13, 2014, the Commission issued D.14-03-004, the LTPP Track 4 decision, which authorized SCE to procure an additional 500 to 700 MW of capacity in the Western LA Basin sub-area due to the retirement of the San Onofre Nuclear Generating Station. Combined, D.13-02-015 and D.14-03-004 authorized SCE to procure between 1,900 and 2,500 MW of capacity in the Western LA Basin.

On November 21, 2014 and November 26, 2014, respectively, SCE filed applications, A.14-11-012 and A.14-11-016, respectively, requesting approval of the results of its

LCR RFOs for the Western LA Basin and the Moorpark, Goleta area. D.15-11-041 approved the results of the LCR RFO for the Western LA Basin and found no need for further procurement. However, D.16-05-053, the decision denying the applications for rehearing, modified D.15-11-041 to require SCE to meet the preferred resource minimum procurement authorization established in D.14-03-004. As a result, SCE is required to procure an additional 169.4 MW of preferred resources in the Western LA Basin, which SCE can procure through Commission authorized procurement mechanisms. Consistent with D.16-05-053, SCE's 2016 RPS Procurement Protocol solicits projects in the Western LA Basin to participate in the 2016 RPS solicitation, if it is conducted. Additionally, projects located in the Western LA Basin that are interconnected to SCE's distribution system served by the Johanna and Santiago substations may also meet SCE's PRP goal.[35]

D.16-05-053 approved the contracts submitted for approval in the Moorpark sub-area and found no further need for LCR procurement in that sub-area. But, the Commission left the docket open to consider the need for the Ellwood generation and linked storage contract to maintain reliability in in the Goleta area.[36] That said, there remains a need for new resources to support operation of the electric system in the Goleta area in an emergency situation because of a lack of either generation or transmission resources in the area.[37] SCE submits that it should act to fill this need as soon as possible. If SCE goes forward with a 2016 RPS solicitation, SCE will solicit renewable resources in the Goleta area to participate in this solicitation.

Because of the critical need for local reliability resources in the Western LA Basin and the Goleta area, SCE will not require projects in those areas to have a Phase II Interconnection Study and will seek to contract with such resources starting before January 1, 2021.

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35 *See* D.14-03-004. More information on the PRP is available at http://on.sce.com/preferredresources.
36 D.16-05-053, pp. 26-32.
37 *Id.* at pp. 28-29.

To the extent SCE receives proposals for projects in the Western LA Basin and Goleta area that are not selected in SCE's RPS solicitation based on LCBF selection criteria, SCE will consider the value of these proposals using the LCR selection process and criteria. Only projects that provide RA benefits and are able to obtain a CAISO Net Qualifying Capacity assignment will be considered for purposes of meeting SCE's LCR in the Western LA Basin and Goleta area. SCE may, in its sole discretion, decide to enter into bilateral contracts with some of these projects based on their LCR value. If SCE does enter into any such contracts, it will submit them for Commission approval through a separate application or advice letter, as appropriate.

III.

PROJECT DEVELOPMENT STATUS UPDATE

Appendix B contains a status update on the development of RPS-eligible projects currently under contract, but not yet delivering generation.[38] SCE received some of the information in this status update from its counterparties. The status of these projects impacts SCE's renewable procurement position and procurement decisions. For instance, SCE adjusts its renewable procurement position during the development stage of a project once it is determined the project will or will not meet its contractual obligations through its forecast probabilistic risk-adjusted success rates.

IV.

POTENTIAL COMPLIANCE DELAYS

Five primary factors will challenge SCE's achievement of the RPS goals: (1) curtailment; (2) the increasing proportion of intermittent resources in SCE's renewables

[38] The 2015 RPS solicitation contracts and contracts executed after the filing of SCE's original 2015 RPS Plan on August 4, 2015 are not included.

portfolio; (3) permitting, siting, approval, and construction of both renewable generation projects and transmission; (4) a heavily subscribed interconnection queue; and (5) developer performance issues. SCE discusses each of these potential issues that could cause compliance delays below and describes the steps it has taken to mitigate the effects of these challenges.

As discussed in Section II.B, in forecasting its renewable procurement position and need, SCE accounts for potential issues that could delay RPS compliance, project development status, minimum margin of procurement, and other potential risks through the use of probabilistic risk-adjusted success rates for energy deliveries from contracted projects that are not yet online. SCE considers the factors discussed below in this process.

A. Curtailment

As more renewable generation comes online, congestion at the transmission and distribution levels can become more common. Several of SCE's contracted wind projects in the Tehachapi region in Kern County, California, for example, have had to curtail deliveries to maintain system reliability in this area. Similarly, many projects in the Antelope and Devers areas have been required to curtail in order to accommodate outages needed for system maintenance and upgrades.

While the upcoming West of Devers ("WOD") upgrade project is necessary in order to provide sufficient transmission capacity to meet the 33% by 2020 and 50% by 2030 RPS goals, curtailment during WOD construction is expected. This expectation of curtailment was disclosed to renewable resources seeking to interconnect to WOD-impacted areas before interconnecting them to the system. However, many of these resources elected to interconnect prior to the completion of the WOD upgrade. Delays in the completion of the WOD upgrade project would increase the amount of curtailment as more resources are added. SCE is evaluating different construction sequence alternatives to minimize the curtailment of renewables. The completion of the WOD project will provide additional transmission capacity that could be utilized to accommodate future generation to meet the 50% RPS goal.

The increase in California's RPS goal from 33% to 50% will result in more intermittent resources on the grid and increased deliveries from RPS-eligible resources, likely resulting in more curtailment of renewable output due to over-generation and possible exacerbation of the problems discussed above.

SCE has been working on multiple fronts to mitigate the risk of curtailment. SCE has continued working to increase the level of coordination with generators during the construction phases of major transmission projects in the Tehachapi, Lugo, and Devers areas, with a particular focus on minimizing the duration of outages that will require curtailments and scheduling work during periods of low production for renewable resources. Further, SCE is developing strategies to utilize economic curtailment rights to enable CAISO to more efficiently achieve generation reductions when and where needed to alleviate congestion in the course of normal operations, and during transmission outages and periods of over-generation. This practice will enable the CAISO to fold renewable resources more directly into market optimization runs.

SCE has had some success reducing curtailment at the distribution level, in part by completing needed system upgrades, but also by giving SCE switching center operators better tools to monitor real-time production levels during outages. This increased visibility enables operators to take more targeted action when generators exceed pro rata limitations, and to more effectively manage aggregate limits in the event not all resources are generating their full pro rata share. SCE will continue to look for opportunities to mitigate the impacts of curtailment on meeting RPS goals.

B. Increasing Proportion of Intermittent Resources in SCE's Renewables Portfolio

Over the last several years, a number of large wind projects in SCE's renewables portfolio (among others, the Alta Wind and Caithness Shepherds Flat projects totaling nearly 2,400 MW) have achieved commercial operation. While these resources have contributed significantly toward SCE's renewables portfolio, they have also made forecasting SCE's renewable procurement position and need more complex. Wind generation is difficult to predict.

Actual production from wind generators varies significantly from hour-to-hour, month-to-month, and year-to-year, thereby exposing SCE to large fluctuations in renewable energy deliveries. Although not as unpredictable as wind generation, solar production also varies over time depending on weather conditions and project performance, among other factors. As wind and solar projects come to represent an ever larger proportion of SCE's renewables portfolio, these effects will be magnified, particularly with California's RPS target increasing to 50%, which will result in more wind and solar projects in SCE's renewables portfolio.

Given the number of intermittent resources expected to achieve commercial operation in the coming years, SCE is preparing to successfully integrate new wind and solar resources. For example, SCE is working on ways to improve forecasting accuracy by collecting actual generation data from new wind and solar resources and analyzing forecasted output versus actual production after-the-fact. SCE is also seeking to maintain a balanced portfolio, while keeping customer cost in mind, in order to ensure there is sufficient diversity of renewable resource types to manage intermittency risk going forward.

C. Permitting, Siting, Approval, and Construction of Renewable Generation Projects and Transmission

The lack of sufficient transmission infrastructure and the process for permitting and approval of new transmission lines continues to be a challenge to reaching the State's renewable energy targets. Lack of adequate transmission infrastructure and the lengthy process of siting, permitting, and building new transmission continues to impede bringing new renewable resources online.

As stated in the CAISO's 2015-2016 Transmission Plan, "[t]he transition to greater reliance on renewable generation has created significant transmission challenges because renewable resource areas tend to be located in places distant from population centers."[39]

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39 CAISO 2015-2016 Transmission Plan, at p. 6.

Through its transmission planning process, the CAISO utilizes renewable resource portfolios from the Commission and the CEC to identify transmission projects that will support the development of renewable resources in areas where they are most likely to occur. This "least regrets" approach helps to address an element of uncertainty that generation developers may have regarding the approval of transmission projects that are necessary for the delivery of renewable energy. While some transmission projects have already been approved or are progressing through the Commission approval process, challenges still remain regarding the completion of those transmission projects. In SCE's service area, there are several major transmission projects included in the CAISO's 2015-2016 Transmission Plan that SCE is pursuing that will contribute to supporting the State's RPS goals. These projects include the Tehachapi Renewable Transmission Project, WOD, Delaney – Colorado River 500 kV line, Devers-Mirage 230 kV line, Lugo – Eldorado 500 kV Line reroute, Lugo-Eldorado series cap and terminal equipment upgrade, the Sycamore – Penasquitos 230 kV line, and the Lugo-Mohave series capacitors project.[40]

The long and complicated permitting process for renewable generation facilities is also a barrier to meeting RPS goals. Moreover, environmental concerns, legal challenges, and public opposition can impact the timeline for bringing renewable generation projects online.

D. A Heavily Subscribed Interconnection Queue

A heavily subscribed CAISO interconnection queue is also a major barrier to achieving the State's RPS goals. As of June 3, 2016, the CAISO reported more than 100 active renewable projects seeking interconnection to the CAISO controlled grid representing more than 20,000 MW of capacity.[41]

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40 *Id.* at 276 CAISO's 2015-2016 Transmission Plan is available at: https://www.caiso.com/Documents/Board-Approved2015-2016TransmissionPlan.pdf.

41 *See* https://www.caiso.com/Documents/ISOGeneratorInterconnectionQueue.pdf.

The large number of interconnection requests, particularly from renewable generators, presents significant challenges for SCE, the CAISO, and renewable generators. Generators that have completed their studies, but not signed generation interconnection agreements, contribute to the uncertainty around available system capacity. When capacity is reserved for generators that have not signed interconnection agreements, other potentially more viable later-queued generators can appear to trigger upgrades that may not be necessary. Although protocols exist to allow the removal of languishing generators from interconnection queues, these protocols are difficult to implement because they can lead to litigation.

E. Developer Performance Issues

Achieving California's renewable energy goals also depends on the successful performance of renewable developers in meeting contractual obligations, timely completing construction milestones, and achieving commercial operation. Hurdles encountered during these activities require developers to alter their milestone schedules. This can result in delays, lengthy contract amendment negotiations, and contract terminations. For example, several of SCE's contracts have terminated due to developer performance issues (e.g., poor site selection, failure to timely secure the necessary permits, and inability to complete CAISO new resource implementation processes in a timely manner). To the extent that delays, termination events, and under-performance occur, the amount of delivered energy on which SCE can rely to reach the State's goals is reduced.

To proactively address developer performance issues, SCE continues to reach out to and communicate with project developers on a regular basis, discuss options and the status of project development, and provide guidance and direction as appropriate. In response to lessons learned in previous solicitations, SCE has also made several modifications to its solicitation materials. The two most relevant updates to solicitation requirements were implemented in the 2014 RPS solicitation in the form of a Phase II Interconnection Study requirement and the Commission-mandated "application deemed complete" requirement with respect to project permitting. These

two requirements have significantly contributed to greater viability in the pool of projects bid into the solicitations. In particular, projects that have achieved this level of development typically have significant dollars invested and secured project-backing, which in most cases has already identified and resolved potential fatal flaws in project location, technology, or environmental factors.

In any 2016 RPS solicitation, SCE will implement an exception to the requirement of a Phase II Interconnection Study for resources located in the Western LA Basin and the Goleta areas where there is a local reliability need. For resources in these areas, a Phase I Interconnection Study will be sufficient to encourage as many projects as possible to submit bids. SCE will carefully consider the viability of projects in these areas that do not have a Phase II Interconnection Study.

V.

RISK ASSESSMENT

SCE describes risks that may result in compliance delays in Section IV. As explained in Section II.B, in forecasting its renewable procurement position and need, SCE accounts for potential issues that could delay RPS compliance, project development status, minimum margin of procurement, and other potential risks through the use of probabilistic risk-adjusted success rates for energy deliveries from contracts that are executed but not yet online. SCE considers these risk factors in this process. Additionally, SCE takes into account historic generation from existing resources, including lower than expected generation, variable generation, and resource availability, among other factors, when forecasting expected generation from its contracted renewable projects. The quantitative analysis provided in Appendices C.1 through C.4 reflects these considerations.

VI.

QUANTITATIVE INFORMATION

A. RNS Calculations

As discussed in Section II.B, Appendices C.1 through C.4 include SCE's RNS calculations using the standardized reporting template included in the RNS Ruling under the RPS program rules. As required by the Commission's RNS Methodology, Appendices C.1 and C.2 include physical RNS calculations and Appendices C.3 and C.4 include optimized RNS calculations.

Appendices C.2 and C.4 include SCE's physical RNS and optimized RNS through 2030, based on the following SCE assumptions:

- SCE's most recent bundled retail sales forecast for 2016 through 2030 which excludes Green Rate customers;
- Contracted projects that are currently online will deliver 100% of their expected amount of renewable energy;
- Probabilistic risk-adjusted success rates for energy deliveries from contracted projects that are not yet online. SCE's forecasts include individual project-specific, risk-adjusted success rates for large, near-term projects and a flat 60% success rate for the remaining projects, which is based on these projects' overall weighted average success rate; and
- 100% success rate for projects originating from pre-approved programs such as ReMAT and BioMAT before contracts from such programs are signed.[42]

Appendices C.1 and C.3 provide SCE's physical and optimized RNS through 2030 using the Commission's RNS Methodology. Appendices C.1 and C.3 use the same assumptions as in Appendices C.2 and C.4 except that:

[42] After contracts from such programs are signed, they are risk-adjusted in the same manner as other projects with executed contracts that are not yet online.

- Instead of using SCE's most recent bundled retail sales forecast for all years, they use SCE's most recent bundled retail sales forecast for 2016 through 2020 and 2025 through 2030 and the standardized planning assumptions that were used in the 2014 LTPP for 2021 through 2024.[43]

At this time, SCE does not propose including a voluntary margin of over-procurement ("VMOP") in its renewable procurement planning. SCE will account for RPS need forecasting risks through the identification and forecast of RECs above its RPS procurement quantity requirements based on its forecast RPS portfolio.

B. Response to RNS Questions

SCE provides the following responses to the RNS questions included in Appendix D to the RNS Ruling.

1. How do current and historical performance of online resources in your RPS portfolio impact future projection of RPS deliveries and your subsequent RNS?

SCE considers weather and specific resource conditions, including maintenance issues, degradation of output, and contractual issues that have impacted historic performance and may cause the output of a facility to be different than what SCE anticipates for the future. SCE takes these considerations into account when it is forecasting its RNS. In particular, if SCE determines any of these conditions will impact a facility's future generation, such generation will be increased or decreased in the forecast for as long as SCE expects the situation to persist. SCE reviews these conditions on a regular basis and updates its generation forecast accordingly.

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[43] The Revised RNS Methodology states that retail sellers can use their own forecasts for bundled retail sales for the first five years and should use the LTPP standardized planning assumptions thereafter. *See* RNS Ruling, Attachment A at p. 25. In Appendices C.1 and C.3, SCE used its own bundled retail sales forecast for 2025 through 2030 because there is no LTPP forecast for those years.

2. Do you anticipate any future changes to the current bundled retail sales forecast? If so, describe how the anticipated changes impact the RNS.

There are many factors that can impact SCE's bundled retail sales forecast. Those factors include, but are not limited to, demographic and macroeconomic drivers, electricity prices, impact from utilities' energy conservation programs, federal and state codes and standards, the California Solar Initiative Program, future customer adoption of distributed generation, future electric vehicle use, and other electrification load growth. In addition, increased consideration of CCA by municipalities may lead to more notifications of CCA formation, which could lead to a longer RPS position for SCE. SCE expects its bundled retail sales forecast to change over time as SCE incorporates the best available information on the various drivers into its forecast. SCE's overall bundled retail sales forecast and resulting forecast RPS RNS will change depending on the net impact of all of these factors. It is not possible for SCE to predict the future changes to its bundled retail sales forecast due to the complex nature of the modeling efforts involved. Accordingly, the bundled retail sales forecast that SCE uses at any given point in time is SCE's best prediction of bundled retail sales. As the bundled retail sales forecast goes up or down, it will increase or decrease SCE's projected RNS accordingly.

3. Do you expect curtailment of RPS projects to impact your projected RPS deliveries and subsequent RNS?

SCE currently forecasts a very small but increasing level of curtailment in solar between 2016 and 2020. Wind is forecasted to have little to no curtailment during this time period. SCE currently uses its forecasted curtailment in 2020 as its forecast for future years. Some details around how SCE makes its curtailment forecast are included below.

For projects in development in the Tehachapi Wind Resource Area ("TWRA"), SCE includes an estimate of curtailed generation based on analysis submitted in SCE's testimony

regarding the Tehachapi Renewable Transmission Project ("TRTP") in its generation forecasts for projects in that location.[44] While potentially conservative, this analysis takes into account expected new interconnections in the TWRA, hourly generation profiles for wind and solar, and expected increases in transmission capacity as TRTP construction progresses. The amount of generation actually curtailed will be a function of real-time load, generation bids for dispatch, actual generation output that differs from cleared bids for dispatch, and the amount of transmission capacity available.

Additionally, to the extent that other projects have been curtailed, or in the event SCE revises its curtailment estimates for resources in Tehachapi or elsewhere in California, those curtailment estimates may be incorporated into forecasts of generation in the future.

4. Are there any significant changes to the success rate of individual RPS projects that impact the RNS?

SCE reviews the status of contracted projects that are not yet online every quarter to assess the likelihood that each project will be successfully constructed and deliver energy. For the larger contracted projects that terminated in the last year, SCE had gradually dropped their likelihood of success over time such that when the projects eventually terminated, there was not a significant impact to SCE's forecast RNS. Overall, SCE has seen a number of large, near-term projects continue to make strides towards completion, resulting in a collectively higher anticipated success rate for these large, near-term projects than was allocated to similar projects in 2015. As mentioned in Section IV.E above, the requirement of a Phase II Interconnection Study or better along with an application deemed complete with the appropriate environmental review agency have both contributed to a higher project success rate.

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[44] *See* Southern California Edison Company's Testimony in Response to the Assigned Commissioner's Ruling on the Tehachapi Renewable Transmission Project (TRTP), Application 07-06-031 (January 10, 2012); Southern California Edison Company's Supplemental Testimony in Response to the Assigned Commissioner's Ruling on the Tehachapi Renewable Transmission Project (TRTP), Application 07-06-031 (February 1, 2012).

5. As projects in development move towards their commercial operation date, are there any changes to the expected RPS deliveries? If so, how do these changes impact the RNS?

As projects move closer to their commercial operation dates, there may be a number of reasons to change the expected RPS-eligible deliveries, including schedule changes from phased projects, commercial operation date changes, and availability of updated forecasted production information. These factors may either increase or decrease the RNS.

6. What is the appropriate amount of RECs above the procurement quantity requirement ("PQR") to maintain? Please provide a quantitative justification and elaborate on the need for maintaining banked RECs above the PQR.

While SCE intends to maintain a bank, determining the appropriate level of RECs above the PQR is dependent on a number of factors: the forecast level and uncertainty of bundled retail sales, fuel source mix in the renewables portfolio, performance of existing resources, project success rates, delay or acceleration of online dates, performance of new facilities once they are operational, the level of the existing portfolio that is re-contracted, and curtailment, among other factors. Annual variability of these factors can either increase or decrease the bank from year-to-year.

SCE does not target a minimum amount or range of RECs above the PQR for banking. Instead, SCE includes the expected success rate for projects in development and incorporates the above risk factors in its forecast, which creates an adequate margin of procurement.

7. What are your strategies for short-term management (10 years forward) and long-term management (10-20 years forward) of RECs above the PQR? Please discuss any plans to use RECs above the PQR for future RPS compliance and/or to sell RECs above the PQR.

When sufficiently long during short-term periods, SCE has used sales of renewable energy products, project deferrals, and solicitation deferrals in order to adjust its renewable procurement back in line with its forecasted RNS. If SCE forecasted short-term shortfalls, SCE would satisfy the need through additional procurement. For example, SCE could re-contract with existing projects, initiate an RPS solicitation, procure through pre-approved procurement programs, or make short-term purchases with Commission approval. Additionally, SCE diligently manages contracts to ensure all contractual obligations are met. SCE uses these activities for renewables portfolio optimization.

Specifically regarding the sale of RECs, when SCE has a long position in the near term, SCE evaluates whether a sale of renewable energy products is appropriate. This evaluation includes a calculation of SCE's renewable procurement position and RPS bank under a set of adverse assumptions. These assumptions include, but are not limited to, lower performance of existing resources than expected, lower risk-adjusted project success rates for contracted generation that is not yet online, and higher levels of curtailment than expected. SCE assesses its renewable procurement position with such adverse assumptions to ensure that, even in an adverse case scenario, SCE would still expect to meet its RPS targets after making the sale. It is not SCE's intent to purchase renewable energy products solely for the purpose of selling them at a later date.

At this time, SCE considers holding an excessive amount of bank in the long-term to be an inefficient use of resources. Rather, SCE generally allocates any near-term forecasted RECs above the PQR to years of forecasted shortfall. Additionally, as described in its response to question 6 above, SCE does not target a minimum amount or range of RECs above the PQR

for banking. SCE takes into account project specific success rates to determine an adequate margin of procurement.

8. Provide Voluntary Margin of Over-procurement ("VMOP") on both a short-term (10 years forward) and long-term (10-20 years forward) basis. This should include a discussion of all risk factors and quantitative justification for the amount of VMOP.

SCE currently does not use a VMOP methodology on either a short-term or long-term basis. While there are different risks that have different impacts in the short and long-term, SCE believes it appropriately accounts for these risk factors in its forecasted RNS as described in prior sections.

9. Please address the cost-effectiveness of different methods for meeting any projected VMOP procurement need, including application of forecast RECs above the PQR.

SCE procures what it believes is needed to meet its RPS targets, allocating any near-term forecasted RECs above the PQR to years of forecasted shortfall. SCE's forecasted need is far enough in the future that SCE believes it can fill that need through additional procurement on a ratable basis. SCE believes it appropriately accounts for risk through the risk factors identified in its response to question 6 above, and currently does not utilize a VMOP.

In the event that SCE implements a VMOP methodology in the future, SCE would use the same methods to procure its projected VMOP procurement need as it uses to procure towards its RPS targets, including procurement of Category 1 products.

10. Are there cost-effective opportunities to use banked RECs above the PQR for future RPS compliance in lieu of additional RPS procurement to meet the RNS?

There are a few alternatives for the potential use of banked RECs above the PQR, including applying them in the future compliance periods, engaging in sales for the amount of bank, and a combination of sales of Category 1 products and procurement of other products. As noted above in response to question 7, SCE does not hold an excessive amount of bank for the sole purpose of selling it later. SCE generally allocates any near-term forecasted RECs above the PQR to years of forecasted shortfall. SCE conducts various portfolio optimization strategies also described in its response to question 7 to manage its renewables portfolio.

11. How does your current RNS fit within the regulatory limitations for portfolio content categories? Are there opportunities to optimize your portfolio by procuring RECs across different portfolio content categories?

All of the procurement in SCE's current renewables portfolio is from either contracts executed prior to June 1, 2010 or contracts for Category 1 products. Accordingly, SCE's procurement fits within the minimum target for Category 1 products and the maximum target for Category 3 products established by SB 2 (1x) and D.11-12-052, as well as the targets established in SB 350.

SCE does see opportunities to optimize its portfolio through procurement across the three portfolio content categories. However, given SCE's current position of no RPS need in the near term, SCE will only solicit Category 1 products if it conducts a 2016 RPS solicitation. Category 1 products will not only help ensure that SCE meets its RPS goals, but also help SCE satisfy its need for energy to serve its customers in a cost effective manner. Additionally, through soliciting near term REC sales, SCE may find opportunities to create value for its customers. SCE believes that by providing flexibility in its procurement strategy, SCE can minimize costs to its customers.

VII.

MINIMUM MARGIN OF PROCUREMENT

SCE's renewable procurement efforts will be guided by its forecast of its renewable procurement needs, as described in Section II.B and provided in Appendices C.1 through C.4. In its forecast of its renewable procurement position and need, SCE currently accounts for the risks of project failure and delay associated with contracted projects that are not yet online. To this end, SCE uses individual project-specific, risk-adjusted success rates for large, near-term projects and a flat 60% success rate for the remaining projects, which is based on these projects' overall weighted average success rate. This probabilistic risk adjustment methodology for discounting expected energy deliveries from projects under development is modeled to represent project development success rates as well as any contingency that would make meeting the State's RPS goals less likely (e.g., delays due to transmission, curtailment, material shortages, load growth beyond that which is forecasted, or less than expected output from resources). Additionally, this methodology provides an appropriate minimum margin of procurement "necessary to comply with the renewables portfolio standard to mitigate the risk that renewable projects planned or under contract are delayed or cancelled."[45] SCE will reassess its position on a periodic basis and, as such, expects that success rates may need to be modified in the future to reflect changes to SCE's portfolio.

The Commission should rely on retail sellers to calculate their minimum margins of procurement and should not attempt to impose a one-size-fits-all approach. As many of the projects in SCE's portfolio become operational, SCE will face different risks, including integration of these resources. The risks associated with project failure will be replaced by less significant risks of projects generating below full capacity. Similarly, SCE expects that the portfolio risk picture is not the same for each retail seller. For example, risks may vary depending on whether a portfolio contains a high proportion of contracts that are online (as

[45] CAL. PUB. UTIL. CODE § 399.13(a)(4)(D).

discussed above) or depending on the various technologies being used (e.g., geothermal technology, which is a baseload resource, versus wind or solar technologies, which are more intermittent as described in Section IV.B). For these reasons, each retail seller should continue to have the authority to revise its approach to calculating the minimum margin of procurement through the RPS procurement planning process and each retail seller should have the flexibility to calculate this margin based on its unique portfolio make-up and procurement needs.

VIII.

BID SOLICITATION PROTOCOL, INCLUDING LCBF METHODOLOGIES

A. Bid Solicitation Protocol

If SCE launches a 2016 RPS solicitation, SCE will use the proposed 2016 Procurement Protocol included here as Appendix F.1. The Procurement Protocol includes, among other things:

- SCE's requirements for initial delivery dates and preferred contract term lengths;
- Deliverability characteristics and locational preferences;
- SCE's preference for LCR and PRP projects;
- Encouragement for Women-Owned, Minority-Owned, Disabled Veteran-Owned, Lesbian-Owned, Gay-Owned, Bisexual-Owned, and/or Transgender-Owned Business Enterprises ("Diverse Business Enterprises") to participate in SCE's RPS solicitation and information on how sellers can help SCE to achieve General Order ("GO") 156 goals;
- Requirements for each proposal submission;
- A description of the type of products SCE is soliciting;
- A schedule of key dates related to the 2016 RPS solicitation; and
- SCE's 2016 *Pro Forma* Renewable Power Purchase Agreement ("*Pro Forma*"), attached as Appendix G.1; and

- 2016 *Pro Forma* Master Renewable Energy Credit Purchase Agreement ("2016 REC Purchase Agreement"), which will be supplied with supplementary materials later.

A discussion of the important changes in the proposed 2016 solicitation documents from SCE's 2015 solicitation documents is included in Section XV.

B. LCBF Methodology

In its LCBF evaluation process, SCE performs a quantitative assessment of each proposal and subsequently ranks them based on each proposal's benefit and cost relationship. The result of the quantitative analysis is a rank order of all complete and conforming proposals' net levelized cost that help define the preliminary shortlist. Following the quantitative analysis, SCE will conduct an assessment of the top proposals' qualitative attributes. These qualitative attributes, including factors such as local reliability, resource diversity, and nominal contract payments, are considered to either eliminate or add projects to the final shortlist based on qualitative attributes, or to determine tie-breakers, if any. Once a project is added to the shortlist, SCE may enter into a PPA with the project. By taking many quantitative and qualitative factors into consideration, SCE ensures that it will select projects best suited for its portfolio in order to meet customer needs and attain the State's RPS goals. Appendix H.1 (the "LCBF Methodology") describes this process, including capacity valuation and the renewable integration cost adder, among other factors.

In accordance with the ACR, SCE is also considering as qualitative factors in its LCBF valuation, the impact of a project on: (1) employment or Workforce Development; and (2) disadvantaged communities which are identified as Environmental Justice communities through California's Environmental Protection Agency's CalEnviroScreen 2.0.

IX.

CONSIDERATION OF PRICE ADJUSTMENT MECHANISMS

As in the past three RPS solicitations, SCE does not plan to solicit price structures based on indices in its 2016 RPS solicitation. Sellers can, however, bid escalation factors in their prices.

Proposals with adjustable pricing based on indices were more common when the renewable industry was starting out. Uncertainties over relatively new technologies made it reasonable to tie pricing to certain commodity indices, inflation rates, or other indices that made sense given the technology. However, the industry is more sophisticated now, supply chains are becoming more stable, and price adjustment mechanisms based on indices are not needed. Sellers and SCE want price certainty and SCE does not want to be subjected to extraordinary high (or unsustainably low) pricing due to fluctuations in a commodity or other indices. Additionally, the ability to bid price adjustments based on indices increases complexity for sellers in the proposal process and for SCE in the evaluation process. Developers are not requesting price adjustment mechanisms and the contract price risk uncertainty associated with them does not warrant their consideration.

X.

ECONOMIC CURTAILMENT, FREQUENCY, COSTS AND FORECASTING

Although SCE has observed very few instances of negative pricing in the day-ahead market,[46] negative prices have been observed on a more regular basis in the real-time market. SCE identifies several factors contributing to increases in instances of negative prices. Over-generation typically occurs in off-peak hours when baseload and must-take renewable generation is high and demand is low, which can cause negative market price hours. On-peak negative

[46] ~ 0.05% of hours in sampled nodes in the day-ahead market – the vast majority of which occur at generally congested interties such as Palo Verde.

prices tend to be localized, transient, and related to congestion caused by a particular transmission bottleneck.

It is generally difficult to forecast negative prices. SCE continues to manage potential instances of negative pricing, and the associated impact to SCE customers, through several different strategies. As a general practice, SCE schedules variable energy resources, such as solar and wind facilities, into the day-ahead market whenever possible. Because resources that are awarded day-ahead schedules are only exposed to negative prices in real-time for deliveries in excess of their day-ahead awards, this practice helps to limit customer exposure to negative prices. This practice is consistent with least-cost dispatch principles, which govern SCE's approach to marketing its entire portfolio of contracted and utility-owned resources.

Additionally, SCE plans to economically bid resources with economic curtailment rights into the day-ahead and real-time markets. Resources with these curtailment rights will then be curtailed as needed based on CAISO's economic dispatch. In some SCE PPAs, there is a pre-defined amount of pre-paid energy per year that may be economically curtailed, subject to some restrictions, without requiring SCE to pay for the energy that could have been delivered but for the curtailment instruction. As noted above, this amount is commonly referred to as a "curtailment cap." Once the curtailment cap is reached, SCE must pay the contract price for energy that could have been delivered but for the curtailment instruction. In other SCE PPAs, SCE has the right to curtail based on economic factors, but must always pay the contract price for energy that could have been delivered but for the curtailment instruction. These types of curtailment rights are commonly referred to as "take-or-pay." In instances where SCE has either exceeded the curtailment cap or only has "take-or-pay" economic curtailment rights to begin with, if SCE were not to curtail deliveries in excess of any schedules awarded at positive prices, customers would pay the contract price for that excess delivered energy *and* incur the costs associated with negative pricing in such intervals. SCE's economic bids will therefore serve to further limit customer exposure to negative prices both day-ahead and in real-time, even if SCE ultimately pays the contract price for curtailed energy.

If SCE conducts a 2016 RPS solicitation, SCE will not require sellers to bid the pre-paid economic curtailment option with the curtailment cap. SCE will retain the right to curtail at its discretion, but will pay for curtailments directly resulting from SCE marketing decisions. As in prior years, SCE will not pay for curtailments in response to an emergency, or due to CAISO or transmission provider instructions.

XI.

CALIFORNIA TREE MORTALITY EMERGENCY PROCLAMATION

The ACR requested that SCE address three fundamental issues regarding the Proclamation. SCE's discussion of each issue is below:

1. *Provide a table listing existing RPS-eligible biomass contracts. The table should include the* contracts' *expiration date, contract capacity, facility name, location, and contract price.*

SCE currently has no existing RPS-eligible biomass contracts.

2. *Describe the benefits that biomass contracts provide to your renewable portfolio.*

The primary benefit that biomass contracts provide to SCE's renewable portfolio is that they help deliver RPS energy. Outside of the RPS benefit, biomass contracts do not offer other unique benefits because biomass facilities are not typically dispatchable nor located in load centers. In fact, biomass facilities in remote mountainous areas could create a problem if the plant output exceeds the system capacity of small networks.

As SCE stated in its Petition for Modification of Decision 10-12-048, "the purpose of the Proclamation is to protect the general public from life safety risks associated with wildfires, to prevent watershed-wide environmental degradation, and to facilitate the removal of dead trees that threaten power lines and other critical infrastructure."[47] Accordingly, these biomass facilities do not offer a unique benefit to SCE's customers but instead are being considered as

[47] Rulemaking 08-08-009, Petition for Modification of Decision 10-12-048 filed jointly by Pacific Gas and Electric Company and Southern California Edison Company, April 19, 2016, at p. 5.

one method to address a state-wide emergency associated with tree mortality that could lead to wildfires, environmental degradation, and impacted transportation infrastructure that could affect all California residents to some degree and could affect mountainous communities directly. In addition, wildfires and falling trees near electric transmission lines[48] could affect electric system reliability that would also affect all electric customers in California.

Biomass facilities provide energy, capacity, and RPS credits but provide no other benefits to IOU electric customers that would justify paying a premium for this energy. However, as identified above, biomass facilities offer benefits to all citizens of California. As a result, any solution to address removal and disposal of HHZ material should fairly distribute above-market costs to all California citizens. Allocating above-market costs solely to IOU bundled electric customers, including SCE's bundled service customers, is not an equitable cost allocation.

3. *When considering authorizing of additional Proclamation-related procurement, what alternatives (e.g. contract extensions) to additional RAM auctions should be considered? Describe the advantages and disadvantages for each alternative in relation to addressing the Proclamation*.

The most significant issues related to addressing the Proclamation is to assure that the above market costs associated with addressing the Proclamation are shared fairly among all citizens of California. In that regard, SCE offers two concepts to allow California to fairly address the Proclamation.

First, the costs and benefits of any BioRAM solicitation should be shared ratably among all electric service providers including municipal utilities, investor owned utilities, and other LSEs. Equitably sharing all costs and benefits among all California electric consumers would fairly allocate those costs and benefits that the IOUs are being required to provide as a benefit to

[48] SCE already maintains a vegetation management program that seeks to remove trees that threaten the electric transmission and distribution lines and also that could increase the risk of fire caused by contact with electric system equipment.

all of California.[49] The advantage would be that costs and benefits would be spread to all electric consumers in California which could increase the pool of customers paying for these above-market costs. The disadvantage is that this would expand the customer base to municipal utilities which is outside of the scope of the Proclamation and outside of the jurisdiction of the Commission. This proposal could not be adopted without further action by the Governor and/or the Legislature.

A second, and possibly more expedient solution would be for various federal, state, and local governmental agencies to fund the cost of disposing of this HHZ material. If public agencies were responsible for the cost of acquiring and disposing of HHZ material, then there may be no above-market electricity costs associated with their disposal. Moreover, if the most efficient disposal method is not through burning HHZ fuel, that method could be chosen. One method that may be available would be sale of the wood to third parties interested in using it. If public agencies decided that burning the HHZ material is the best option, the cost would be paid through public funds. The benefit of this proposal to the Proclamation is that it would allow public agencies to have complete control of the process to identify HHZ materials to be harvested and the quantity of HHZ material that is harvested. The disadvantage related to the Proclamation is that this approach relies on public funds that may be difficult to acquire.

Another consideration for the Tree Mortality issue is that the Commission should carefully consider the disconnect between the amount of HHZ material that is available to be harvested versus the amount of HHZ material that can be reliably harvested in order to support continuous or near continuous utilization of biomass facilities. The Commission should consider solicitation of seasonal BioRAM contracts that would be in effect only during the months that reliable levels of HHZ material can be available to the biomass facility. HHZ material availability is influenced by several factors including snowpack, forest fires, distance from the

[49] To completely share costs, the Commission should consider a minimum fixed customer charge that would also recover costs from net energy metering customers.

HHZ material to the biomass facility, and so on. Future BioRAM solicitations should consider these seasonal factors and not attempt to force a baseload annual contract to a fuel source that is only available during certain seasons. Considering the seasonal availability of HHZ material will significantly impact how the Commission addresses the Proclamation. Finally, contracts to meet the needs of a Proclamation to address HHZ material removal should not pay above-market costs once the emergency described in the Proclamation has ended. As a result, special consideration should be made to adopt short-term contracts, adopt termination rights for buyer or seller, or adopt market-based contract pricing in the event that HHZ material is not available or if the tree mortality issue becomes a non-emergency.

XII.

EXPIRING CONTRACTS

For SCE's RPS-eligible contracts expiring in the next ten years, Appendix E includes the name of the facility, technology, contract expiration date, nameplate capacity, expected annual generation, location, contract type, and portfolio content category classification. SCE used the template for reporting on RECs from expiring contracts as provided in the RNS Ruling.

XIII.

COST QUANTIFICATION

The spreadsheet attached as Appendix D includes actual expenditures per year for RPS-eligible generation for every year from 2003 through 2015, as well as actual RPS-eligible generation for every year from 2003 through 2015. Appendix D also includes a forecast of future expenditures SCE may incur every year from 2016 through 2030, as well as a forecast of expected generation for every year from 2016 through 2030.

XIV.

IMPERIAL VALLEY

In SCE's 2015 RPS solicitation, SCE received 279 proposals. [redacted]

[redacted]

[redacted]

XV.

IMPORTANT CHANGES FROM 2015 RPS PLAN

SCE has made significant changes to the Written Plan to recognize that SCE, at present, has no need for eligible renewable resources. As a result, SCE has not yet decided whether to go forward with a 2016 RPS solicitation. SCE will inform the Commission via a Tier 1 Advice Letter by March 1, 2017 whether it will go forward with a 2016 RPS solicitation and will provide a proposed schedule for that solicitation at that time. Any 2016 RPS solicitation held by SCE may include a request for offers to purchase from SCE RECs of 2016-2020 vintage and will include one of the two required Community Renewables solicitations. SCE's Written Plan also includes new materials to comply with the ACR concerning: (1) the Proclamation regarding Tree Mortality, (2) Workforce Development, and (3) Disadvantaged Communities.

SCE's 2016 RPS Plan includes changes to: (1) SCE's 2016 Procurement Protocol; (2) SCE's 2016 *Pro Forma*; and (3) SCE's LCBF Methodology. Those changes are summarized below. SCE has included redlines of its 2016 Procurement Protocol, 2016 *Pro Forma*, and LCBF Methodology against the versions of those documents included in SCE's 2015 RPS Plan as Appendices F.2, G.2, and I.2, respectively. SCE has made relatively few changes to these documents from the 2015 documents. The most significant changes are summarized below.

A. Important Changes in 2016 Procurement Protocol

1. Considering Proposals only for Category 1 Products

In the 2015 RPS solicitation, SCE solicited long-term Category 1, Category 2, and Category 3 products. As provided in SCE's 2016 Procurement Protocol, SCE will only consider proposals for Category 1 products from both new and existing generation facilities if it launches a 2016 RPS solicitation.

SCE has made this change given its relatively long RPS position in the near term. SCE believes that projects providing Category 1 product are best suited to deliver energy in the long-term and be flexible on start dates and term length.

2. Commercial On-Line Date Beginning on January 1, 2021 or Later

If SCE conducts a 2016 RPS solicitation, SCE wants to focus the efforts of both SCE and sellers on proposals that are likely to be most valuable to customers. To this end, SCE intends to solicit Category 1 products with delivery terms commencing on or after January 1, 2021, except in the Western LA Basin and Goleta area. SCE has no need for near-term eligible renewable resources at this time. Therefore, if SCE conducts a 2016 RPS solicitation, SCE will require sellers to offer projects with a start date of January 1, 2021 or later, unless they are located in the Western LA Basin or Goleta area where there is currently a specific local reliability need. The proposed 2021 start date helps to align deliveries with SCE's need, while establishing an online date that is not so far into the future as to make it unrealistic for sellers to bid projects that are near "shovel ready."

3. Offering 10 Year Term Lengths or Less

As discussed above, if SCE launches a 2016 RPS solicitation, SCE will allow sellers to offer terms of any length. However, SCE will also require that sellers propose at least one offer with a term length of 10 years or less for each project. With the changing RPS rules

that may result with the implementation of SB 350 along with the uncertainties around future load growth, distributed energy resources, departing load, electric vehicles and industry technology advances, it is prudent to solicit contracts with shorter term lengths.

4. Solicitation Schedule is To Be Determined

Typically, SCE's RPS Procurement Protocol includes a proposed schedule for the RPS solicitation. However, in 2016, SCE has not yet decided whether to move forward with a 2016 RPS solicitation. So, the proposed scheduled for the 2016 RPS solicitation, included in the 2016 RPS Procurement Protocol, at Section 3.01, includes only the events that may occur, if SCE decided to go forward with the solicitation, but shows the dates as "to be determined." If SCE decides to go forward with a 2016 RPS solicitation, it will inform the Commission of its plan via Tier 1 Advice Letter no later than March 1, 2017. That Advice Letter will attach a revised Section 3.01 to the 2016 RPS Procurement Protocol with dates filled in.

5. REC Sales Will Be Part of this Solicitation

As discussed above, SCE plans to solicit offers for SCE to sell RECs of 2016-2020 vintage as part of any 2016 RPS solicitation that it may hold. The 2016 RPS Procurement Protocol, in Article 1, includes solicitation of proposals to sell RECs of 2016-2020 vintage which may be part of any 2016 RPS solicitation.

6. Workforce Development

The ACR, at p. 14, stated that "the 2016 RPS Procurement Plans shall include a description of a proposed approach for assessing and differentiating the ability of different bids to contribute to employment growth." The 2016 RPS Procurement Protocol, at Section 3.2(g)(i), includes a requirement that each bid address its ability to contribute to employment growth. As discussed in Section XV.C.1 below and in Appendix H.1, SCE's LCBF methodology will assess this information as one of the qualitative factors considered for each bid.

7. Disadvantaged Communities

The ACR, at p. 15, quoted from Public Utilities Code Section 399.13(a)(7) requiring the utilities to "give preference to renewable energy projects that provide environmental and economic benefits to communities afflicted with poverty or high unemployment, or that suffer from high emission levels of toxic air contaminants, criteria air pollutants, and greenhouse gases." The ACR then stated that "the 2016 RPS Procurement Plans shall include a description of their methodology for preferring projects that provide the benefits described in 399.13(a)(7)." The 2016 RPS Procurement Protocol, at Section 3.2(g)(i), includes a requirement that each bid address its impact, if any, on such disadvantaged communities, identified in the Environmental Justice communities through California's Environmental Protection Agency's CalEnviroScreen 2.0. As discussed in Section XV.C.2 below and in Appendix H.1, SCE's LCBF methodology will assess this information as one of the qualitative factors considered for each bid.

B. Important Changes in 2016 *Pro Forma*

The changes to the *Pro Forma* were either minor or clean-up items.[50] A redline of the 2016 Pro Forma showing all of the changes from the 2015 RPS Pro Forma is attached as Appendix F.2. Additionally, changes related specifically to the Standard Contract Option are mentioned in Section XVII.B. If SCE goes forward with a 2016 RPS solicitation it will include a Community Renewables solicitation. SCE will use the Community Renewables Rider ("CR Rider") to the 2015 Standard Contract Option, which SCE submitted to the Commission via Advice Letter 3422-E for its Community Renewables PPAs.

SCE will provide its 2016 *Pro Forma* Master Renewable Energy Credit Purchase Agreement with supplementary materials later in the 2016 RPS review process.

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[50] SCE also made changes to the Green Rate provisions that mirror the CR-Rider.

C. Important Changes in 2016 Least Cost, Best Fit Methodology

1. Workforce Development

SCE will review information submitted by the bidders describing the impact of their project on employment growth as one of the qualitative factors that it considers in its evaluation of each bid, as further discussed in Section II.A.1(f) of Appendix H.1

2. Disadvantaged Communities

SCE will review information submitted by the bidders describing the impact of their project on disadvantaged communities as one of the qualitative factors that it considers in its evaluation of each bid, as further discussed in Section II.A.1(f) of Appendix H.1.

3. Selection Criteria for Community Renewables

If SCE holds a 2016 RPS solicitation, one of its two required Community Renewables solicitations will be part of the 2016 RPS solicitation. As a result, SCE added to its LCBF Methodology in Section III.A of Appendix H.1 a discussion of the bid evaluation and selection process for Community Renewables.

XVI.

SAFETY CONSIDERATIONS

SCE is strongly committed to safety in all aspects of its business. Renewable sellers are responsible for the safe construction and operation of their generating facilities and compliance with all applicable laws and safety regulations. SCE has taken several steps to address those issues over which it has the most visibility and control – the delivery of renewable electricity products to SCE in a reliable, safe, and operationally sound manner.

As with past RPS *pro forma* PPAs, SCE's 2016 *Pro Forma* provides that the seller must operate the generating facility in accordance with "Prudent Electrical Practices."[51] The detailed definition of "Prudent Electrical Practices" includes "those practices, methods and acts that would be implemented and followed by prudent operators of electric energy generating facilities in the Western United States, similar to the Generating Facility, during the relevant time period, which practices, methods and acts, in the exercise of prudent and responsible professional judgment in the light of the facts known or that should reasonably have been known at the time the decision was made, could reasonably have been expected to accomplish the desired result consistent with good business practices, reliability and safety. . . ."[52]

Consistent with SCE's focus on safety, SCE's 2016 *Pro Forma* also provides that, prior to commencement of any construction activities on the project site, the seller must provide to SCE a report from an independent engineer certifying that seller has a written plan for the safe construction and operation of the generating facility in accordance with Prudent Electrical Practices.[53]

SCE also has a safety section in its 2016 Procurement Protocol providing that sellers must possess a written plan for the safe construction and operation of the generating facility as set forth in the 2016 *Pro Forma*.[54]

XVII.

STANDARD CONTRACT OPTION

In D.14-11-042, the Commission ended the RAM program, as authorized in D.10-12-048, after the conclusion of the RAM 6 auction.[55] The Commission also authorized the IOUs to use

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51 *See* 2016 *Pro Forma* (attached as Appendix G.1) at Section 3.12(a).
52 *See id.* at Exhibit A.
53 *See id.* at Section 3.11(e).
54 *See* 2016 Procurement Protocol (attached as Appendix F.1) at Section 9.03.
55 *See* D.14-11-042 at pp. 91-92, pp. 102-104.

an optional streamlined RAM procurement tool in future RPS solicitations.[56] The Commission directed the IOUs to include the streamlined procurement tool in their RPS Procurement Plans, at their discretion, starting with the 2015 RPS Procurement Plans.[57]

As in the 2015 RPS solicitation, SCE plans to include a "Standard Contract Option" using the RAM procurement tool in any 2016 RPS solicitation that it may conduct. Consistent with the Commission's intent to provide the IOUs with flexibility to optimize their portfolios based on their procurement needs while providing a streamlined procurement tool,[58] the Standard Contract Option will allow for rapid development of renewable projects by avoiding the contract negotiation process and expediting the Commission approval process of executed PPAs. Sellers will have the option to participate in the Standard Contract Option by checking a box in the RPS proposal form. The Standard Contract Option will only be available to projects with a first point of interconnection to the CAISO, and not to dynamically scheduled projects.[59]

Subject to SCE's selection of the proposal and agreement that a standard contract is appropriate for the proposal, sellers will be offered a standard contract in the form of the 2016 *Pro Forma* with no negotiations. Once executed, the Standard Contract Option PPAs will be submitted to the Commission for approval via a Tier 2 advice letter. This process uses the same approval process as in RAM, which was one factor in SCE successfully procuring 787 MW of renewables over five years in six auctions.

In the sections below, SCE discusses the parameters of the Standard Contract Option and their consistency with D.14-11-042.

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56 *See id.* at pp. 91-92.
57 *See id.* at p. 92.
58 *See id.*
59 SCE's 2016 *Pro Forma* is structured with the assumption that the generating facility will have a first point of interconnection with the CAISO. Accordingly, changes to the 2016 *Pro Forma* will be required for dynamically scheduled projects.

A. Procurement Need

In D.14-11-042, the Commission stated that the IOUs should explain in their RPS Procurement Plan filings how any proposed use of the streamlined RAM procurement tool could satisfy an authorized procurement need, "including, for example, system Resource Adequacy needs, local Resource Adequacy needs, RPS needs, reliability needs, LCR needs, GTSR needs, and any need arising from Commission or legislative mandates."[60] In a 2016 RPS solicitation, SCE will use the Standard Contract Option to satisfy its RPS and energy needs. SCE will also use the Standard Contract Option for Community Renewables procurement needs as discussed in Section XVIII. Community Renewables has a Rider that modifies the Standard Contract Option, which is detailed in Section XVIII. SCE may also use the Standard Contract Option to fulfill other authorized procurement needs in the future.

B. Standard Contract

The Commission required IOUs to seek Commission authorization for a revised standard contract so that the RAM tool can continue to be a more streamlined contracting and approval process.[61] SCE uses its current *Pro Forma* as the standard contract for the Standard Contract Option. The RAM standard contract and SCE's RPS *pro forma* PPAs are closely aligned. Changes to the RPS *pro forma* PPA that were approved for use in RPS solicitations were subsequently requested and generally approved for use in the next RAM cycle, and vice versa. Additionally, both the RPS *pro forma* PPA and the RAM standard contract have been drafted in a manner that allows for the simple insertion of project specific information without any other modifications to the terms and conditions. Specifically, project-specific parameters can be inserted into the 2016 *Pro Forma* (e.g., project size, technology, location, and other project specific attributes), and the resulting contract will be the standard contract. Additional non-

60 D.14-11-042 at p. 92.
61 *See id.* at p. 93.

material ministerial changes to the 2016 *Pro Forma* may also be needed in the standard contracts; for example, to correct typographical errors or section references or delete definitions that are not needed for particular projects.

It will be considerably more efficient for SCE, the Commission, the parties, and the market to update one *pro forma* PPA each year, rather than having separate *pro forma* PPAs for Standard Contract Option and non-Standard Contract Option projects. Further, one *pro forma* PPA eliminates market distortions that might come from commercial differences that could skew sellers toward or away from the Standard Contract Option.

For 2016, SCE made changes applicable to the Standard Contract Option to: (i) the Commercial Operation Date, and (ii) extensions to the Commercial Operation Date. These changes were made to correct an error in the previously approved 2015 *Pro Forma* Standard Contract Option provisions, which incorrectly stated that the Commercial Operation Date must be no later than 24 months from CPUC Approval rather than 36 months from CPUC Approval.

C. Project Size Restrictions

The Commission eliminated the RAM project size restrictions for the streamlined RAM procurement tool and authorized the IOUs to establish project size requirements based on their specific procurement needs at the time of the solicitation.[62] SCE does not propose to include any project size restrictions for the Standard Contract Option in a 2016 RPS solicitation. SCE will allow sellers to propose projects of any size, but not less than the minimum of 500 kilowatts for the 2016 solicitation.

While SCE will allow sellers with projects of any size to select the Standard Contract Option, SCE must also agree that the Standard Contract Option is appropriate for the seller's proposed project. For proposals that state a preference for a standard contract, SCE reserves the right to discuss with a seller the need to negotiate certain terms and conditions when appropriate.

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62 *See id.* at p. 94.

Although project size is not the only example of a parameter that might trigger such a situation, very large projects do often carry more complicated issues that warrant careful construction of a negotiated PPA. The Standard Contract Option will only be used if both SCE and the seller agree that it is appropriate for the specific project.

D. Project Categories

The Commission retained the RAM product category requirement (peaking, non-peaking, baseload), but did not mandate that the IOUs procure a specific amount from each product category.[63] While SCE does not intend to set specific targets for each product category, SCE will consider all the product categories and they will be indicators of SCE's desire to balance the resources in its diverse renewables portfolio. SCE intends to conduct its selection process for both the negotiated track and the Standard Contract Option using LCBF criteria.

E. Restriction on Subdivided Projects

In D.14-11-042, the Commission eliminated the prohibition against subdivided projects participating in RAM, and required the IOUs to define the terms they will use to either include or exclude subdivided projects.[64] SCE sees no need to impose a restriction on subdivided projects in its Standard Contract Option for the 2016 RPS solicitation, particularly given that it is not imposing a size restriction.

F. Locational Restrictions

The Commission removed the requirement that RAM projects be located in the service territories of the IOUs, and permitted the IOUs to procure anywhere within the CAISO control area, including dynamically scheduled resources, to increase the available pool of resources.[65]

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63 *See* D.14-11-042 at p. 95.
64 *See id.* at p. 96.
65 *See id.* at pp. 97-98.

SCE's Standard Contract Option for the 2016 RPS solicitation will be applicable to projects with a first point of interconnection to the CAISO control area, but will not include dynamically scheduled resources. Dynamically scheduled resources generally require some changes to SCE's RPS *pro forma* PPA.

G. Valuation and Selection

The Commission found it reasonable to require the IOUs to use the same valuation methodologies used in their RPS solicitations for the RAM procurement tool.[66] SCE will use its LCBF evaluation process for valuation and selection of Standard Contract Option projects. In order to be selected, the value of a Standard Contract Option project must be within the range established by the SCE's 2016 RPS solicitation shortlist based on SCE's LCBF methodology as described in Appendix H.1. This approach results in all projects being valued utilizing the same methodology, and lends fairness to the process while increasing competition among sellers.

H. Interconnection Studies

In D.14-11-042, the Commission required that projects participating in the RAM procurement tool process have a Phase II Interconnection Study (or the equivalent).[67] Consistent with that decision, SCE will apply the same Phase II Interconnection Study requirement to Standard Contract Option and non-Standard Contract Option projects in its 2016 RPS solicitation, except for projects located in the Western LA Basin and Goleta area where there is local reliability need. In those areas, a Phase I Interconnection Study will be required.

66 *See* D.14-11-042 at pp. 98-99.
67 *Id.* at p. 100.

I. Commercial Operation Deadline

For new projects, the Commission imposed a commercial operation deadline requirement for the RAM procurement tool of 36 months with a six month extension for regulatory delays.[68] The Commission also exempted existing projects from going through the RAM viability screens, which include: (1) site control; (2) development experience; (3) commercial technology; and (4) interconnection application.[69] SCE will include the 36 month commercial operation deadline with a six month extension for regulatory delays in its Standard Contract Option for new projects. Moreover, SCE does not intend to apply any separate RAM viability screens to Standard Contract Option projects. However, SCE does believe it is appropriate to apply the same eligibility requirements that apply to all other existing projects participating in the 2016 RPS solicitation to Standard Contract Option projects. In particular, existing projects with interconnection agreements that terminate before the start of the new RPS PPA should be required to demonstrate that they will have a new interconnection agreement in place at the start of the new RPS PPA. Those existing projects with interconnection agreements that continue during the new RPS PPA should be required to demonstrate that they are not making any modifications that would prevent them from delivering under their existing interconnection agreements. Existing projects should not be permitted to circumvent solicitation eligibility requirements by selecting the Standard Contract Option.

J. Commission Approval Process

In D.14-11-042, the Commission permitted the IOUs to seek approval of RAM procurement tool projects through the Tier 2 advice letter process or to request approval of another approval process in their RPS Procurement Plans.[70] As noted above, SCE proposes to seek approval of Standard Contract Option projects through the Tier 2 advice letter process.

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68 *See id.* at p. 101.
69 *See id.*
70 *See id.*

XVIII.

GREEN TARIFF SHARED RENEWABLES PROGRAM

On September 28, 2013, Governor Brown signed SB 43 into law.[71] SB 43 enacted the GTSR program, a 600 MW statewide program that allows participating utilities' customers – including local governments, businesses, schools, homeowners, municipal customers, and renters – to meet up to 100% of their energy usage with generation from eligible renewable energy resources. As required by SB 43, all of the IOUs filed applications with the Commission requesting approval of GTSR programs consistent with the requirements and intent of the statute.

On January 29, 2015, the Commission adopted D.15-01-051, implementing a GTSR program framework and approving the IOUs' applications with modifications. Among other things, the Commission divided the GTSR program's statewide limitation of 600 MW of customer participation among the IOUs. Specifically, the Commission allocated 269 MW to SCE.[72] SB 43 also provides that 100 MW of the statewide limitation for the GTSR program shall be reserved for facilities that are no larger than 1 MW and that are located in areas previously identified by the California Environmental Protection Agency as "the most impacted and disadvantaged communities" [73] (referred to as "environmental justice" or "EJ" projects by SCE). To implement this statutory provision, the Commission established EJ and residential reservations for each IOU, including 45 MW to SCE.[74]

The GTSR program structure approved by the Commission consists of two elements: (1) a green tariff option (called the "Green Rate" by SCE) allowing customers to purchase energy with a greater share of renewables, and (2) an enhanced community renewables option (called the "Community Renewables" or "CR" program by SCE) allowing customers to subscribe to

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71 SB 43 was codified in California Public Utilities Code Section 2831 *et seq*.
72 *See* D.15-01-051 at Ordering Paragraph 7.
73 CAL. PUB. UTIL. CODE § 2833(d)(1).
74 *See* D.15-01-051 at Ordering Paragraph 7 and D.15-01-051 at pp. 4-5.

renewable energy from community-based projects.[75] With regard to the Green Rate, SCE has already procured its 50 MW advance procurement requirement in its 2015 RPS solicitation. SCE does not anticipate doing additional Green Rate procurement in the 2016 RPS solicitation. This is because the Green Rate program currently has a limited number subscribed customers and SCE's advance procurement is expected to satisfy initial customer enrollment.

A. Community Renewables - Background

The Commission authorized RAM as a procurement mechanism for the CR program, including the streamlined RAM procurement tool that can be used as part of the IOUs' RPS solicitations.[76] The Commission limited initial procurement to new solar facilities between 0.5 MW and 3 MW,[77] but modified this in D.16-05-006 to include all eligible renewable resources between 0.5 MW and 20 MW for CR projects and all eligible renewable resources between 0.5 MW and 1 MW for CR-EJ projects.[78] CR projects must be located within SCE's service territory[79] and must satisfy the eligibility requirements associated with the RAM procurement tool.[80]

SCE has filed several advice letters to implement the CR program, including: (i) Advice 3180-E identifying the eligible census tracts for EJ projects in its service territory;[81] (ii) Advice 3218-E, which is the IOUs' Joint Procurement Implementation Advice Letter; (iii) Advice 3219-E, which is SCE's Customer-Side Implementation Advice Letter; (iv) Advice 3220-E, which is SCE's Marketing Implementation Advice Letter; [82] (v) Advice 3432-E, which

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75 See *id.* at pp. 3-4.
76 *See id.* Ordering Paragraph 1.
77 *See id.* at pp. 36-37, p. 39, Conclusion of Law 17.
78 *See* D.16-05-006, Conclusions of Law 2 and 4.
79 *See* D.15-01-051 at pp. 21-23, Conclusion of Law 14.
80 *See* D.16-05-006 at p. 35, Conclusion of Law 4.
81 Advice 3180-E was approved by the Energy Division effective as of February 23, 2015.
82 The Commission approved Advice 3218-E, 3219-E, and 3220-E, with modifications, in Resolution E-4734.

is the 20 Year Forecast of GTSR bill credits and charges;[83] and (vi) Advice 3422-E, which makes changes to SCE's 2015 *Pro Forma* Renewable Power Purchase and Sale Agreement, Standard Contract Option and RFO instructions, needed to implement the CR program through the RAM procurement tool consistent with D.16-05-006 (the "CR-RAM RFO"), and also requested closure of SCE's CR-MAT program because projects eligible for SCE's CR-MAT program will also be eligible for SCE's CR-RAM program. [84]

B. Community Renewables - Modifications to the 2016 Procurement Protocol, 2016 Pro Forma Standard Contract Option, and LCBF Methodology

SCE has incorporated CR-related modifications into its 2016 Procurement Protocol, created a CR Rider and Amendment to the 2016 *Pro Forma* Standard Contract Option, and incorporated modifications to its LCBF Methodology for CR and CR-EJ eligible projects. SCE will include a Community Renewables solicitation in any 2016 RPS solicitation that it decides to have. If SCE does not go forward with a 2016 RPS solicitation, it will move forward separately with a second Community Renewables Solicitation.

1. 2016 Procurement Protocol – CR Modifications

The 2016 Procurement Protocol includes additional requirements applicable only to CR and CR-EJ projects. CR and CR-EJ projects must agree to participate in the RAM tool via the 2016 Pro Forma Standard Contract Option and CR Rider and Amendment, consistent with the Commission's direction in D.15-01-051 and D.16-05-006.[85] The Procurement Protocol also contains specific instructions applicable to CR and CR-EJ projects only, including:

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83 SCE submitted Advice 3432-E on July 11, 2016, which has not been approved as of the date of this filing.

84 SCE submitted Advice 3422-E on June 15, 2016, which has not been approved as of the date of this filing.

85 *See* D.15-01-051 at pp. 21-23, Conclusion of Law 7, and D.16-05-006 Ordering Paragraph 1.

- RAM Eligibility: CR and CR-EJ projects must comply with the eligibility requirements of applicable to the RAM procurement tool.
- Contract Capacity: CR projects must have a minimum project size of 0.5 MW and a maximum project size of 20 MW; and CR-EJ projects must have a minimum project size of 0.5 MW and a maximum project size of 1 MW.
- Procurement Targets: 75 MW is identified as the minimum procurement target ("Minimum Procurement Target").
- Community Interest: CR and CR-EJ projects must demonstrate fulfillment of the community interest requirements pursuant to Decisions 15-01-051 and 16-05-006 within 60 days of notification of contract award or the awarded capacity may be assigned to the next highest ranking LCBF CR or CR-EJ project offer. In addition, at least 50% (by number of customers) and at least 1/6th of the demonstrated community interest in CR and CR-EJ projects must come from residential customers.

2. 2016 *Pro Forma*, Standard Contract Option – CR Rider and Amendment Modifications

In Advice Letter 3422-E, pursuant to D.16-05-006, SCE transferred the previously approved CR and CR-EJ program, as well as the CR-MAT Rider and Amendment provisions to the RAM tool, creating a CR-RAM Rider and Amendment to the approved 2015 RPS *Pro Forma* Standard Offer Contract (the "Current CR-RAM Rider"). The Current CR-RAM Rider will work with the 2016 RPS *Pro Forma* Standard Offer Contract because it contains only minor changes from the 2015 RPS *Pro Forma* Standard Offer Contract. The Current CR-RAM Rider included a number of modifications necessary to implement the requirements of D.16-05-006. SCE intends to utilize the Current CR-RAM Rider, as modified by any future supplemental advice letters or as required by the Commission (the "Approved CR-

RAM Rider") to procure CR-eligible resources as part of any the 2016 RPS solicitation that it may decide to hold. If SCE does not decide to hold a 2016 RPS solicitation, it will hold a second CR solicitation.

3. LCBF – CR Modifications

As with other RPS-eligible projects, CR and CR-EJ projects will be selected using the LCBF methodology, subject to the additional selection criteria as follows: (i) SCE may decline to award contracts to developers that bid a price in excess of 120 percent (for CR projects) and 200 percent (for CR-EJ projects) of the maximum executed contract price in either the RAM as-available peaking category or the Green Rate program, whichever occurred most recently ("Procurement Price Limits");[86] (ii) when Minimum Procurement Targets are exceeded, first, SCE must select the LCBF CR-EJ projects with offer prices less than the Procurement Price Limit up to the EJ reservation amount established in D.15-01-051, then SCE will evaluate all remaining projects against one another on a LCBF basis and SCE must select those projects with offer prices less than the applicable Procurement Price Limit, up to the Procurement Target.[87]

C. Green Rate and Community Renewables – Annual Reporting

In D.15-01-051, the Commission directed the IOUs to include certain additional information in an annual report (the "GTSR Report").[88] The GTSR Report will be filed on September 1, 2016 and will include: (i) progress toward GTSR procurement, including EJ and residential reservations, (ii) information on the transfer of capacity between the GTSR and RPS programs, and the cost impacts of that transfer and impact on the IOUs' RNS, (iii) the need, if any, to bridge for any shortfall, (iv) accounting of RECs, and (v) a list of contracts with price, and other relevant details.[89]

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86 *See* D.16-05-006 at Ordering Paragraph 3.
87 *See* Ordering Paragraph 2.
88 *See* D.15-01-051 at pp. 32-33, p. 41, pp. 68-69, and p. 143.
89 *See* Advice 3218-E at p. 24 and p. 32.

XIX.

OTHER RPS PLANNING CONSIDERATIONS AND ISSUES

A. Bilateral Transactions

As part of its overall procurement strategy, SCE may engage in bilateral negotiations for renewable energy purchases or sales subject to the Commission's review and approval of completed transactions.

B. Energy Storage Procurement

Public Utilities Code Section 2837 requires the IOUs' RPS Procurement Plans to incorporate any energy storage targets and policies that are adopted by the Commission as a result of its implementation of AB 2514. To implement AB 2514, the Commission adopted D.13-10-040, which implemented an energy storage procurement framework and design. The Commission also directed SCE to procure 580 MW of energy storage by 2020, with projects installed and delivering by 2024.[90]

SCE conducted a 2014 Energy Storage RFO to help meet the target identified in D.13-10-040. SCE signed three contracts from that RFO for a total of 16.3 MW. Additionally, SCE launched an Aliso Canyon Energy Storage RFO in June 2016 and is currently evaluating the offers received.

SCE will allow proposals with energy storage in a 2016 RPS solicitation where the seller controls the storage. Because of SCE's limited RPS needs, SCE does not intend to solicit RPS projects with energy storage where SCE controls the dispatch or charging of the storage units. Instead, SCE will consider such energy storage offers in its 2016 Energy Storage solicitation.

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90 *See* D.13-10-040 at p. 15 and p. 26.

PUBLIC APPENDIX A

Redline of 2016 Written Plan

An *EDISON INTERNATIONAL* Company

(U 338-E)

~~2015~~2016 Written Plan

~~January 21,~~August 8, 2016

PUBLIC VERSION

~~2015~~2016 Written Plan

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I.

EXECUTIVE SUMMARY OF ~~2015~~2016 RPS PLAN

In accordance with the Assigned Commissioner and Assigned Administrative Law Judge's ~~Revised~~ Ruling Identifying Issues and Schedule of Review for ~~2015~~2016 Renewables Portfolio Standard ("RPS") Procurement Plans, dated May ~~28, 2015 ("ACR"), and the Decision Accepting Draft 2015 Renewables Portfolio Standard Procurement Plans, Decision ("D.") 15-12-025, issued December 22, 2015,~~17, 2016 ("ACR"), and the E-Mail Ruling Granting, in Part, IOUs[1] Request for an Extension of Time to Produce the 2016 RPS Procurement Plans, dated June 8, 2016, Southern California Edison Company's ("SCE~~") Final 2015 Renewables Portfolio Standard ("RPS")~~'s") 2016 RPS Procurement Plan ("~~2015~~2016 RPS Plan") details SCE's plan for ~~procuring renewable resources to satisfy~~satisfying the State's RPS goals in a manner that minimizes costs and maximizes value for SCE's customers.

This ~~2015~~2016 RPS Plan discusses SCE's renewables portfolio, the process SCE uses for forecasting its renewable procurement need, SCE's forecasted renewable procurement position through 2030, SCE's portfolio optimization strategy and management of its renewables portfolio, lessons learned from SCE's experience with renewable procurement, past and future trends, and additional policy and procurement issues. Additionally, SCE explains its plans for achieving California's RPS targets, ~~focusing on SCE's proposal to conduct a 2015~~and discusses SCE possibly conducting a 2016 RPS solicitation. SCE's ~~2015~~2016 RPS Plan includes its ~~2015~~2016 Procurement Protocol~~, 2015~~ and 2016 *Pro Forma* Renewable Power Purchase Agreement, ~~2015 *Pro Forma* Master Renewable Energy Credit Purchase Agreement,~~ a description of SCE's least-cost best-fit ("LCBF") evaluation methodology, including consideration of workforce

[1] The IOUs are the Investor Owned Utilities, which include Pacific Gas and Electric Company ("PG&E"), Southern California Edison Company ("SCE"), and San Diego Gas & Electric Company ("SDG&E").

development and disadvantaged communities, and a summary of the important changes from SCE's ~~2014~~2015 RPS solicitation documents.

Further, this ~~2015~~2016 RPS Plan addresses other issues set forth in the ACR, statute, and other California Public Utilities Commission ("Commission" or "CPUC") decisions. Specifically, SCE's ~~2015~~2016 RPS Plan includes discussion of the following additional topics:

~~· Consideration of a higher RPS goal;~~

- Project development status update;
- Potential compliance delays and risks;
- Quantitative information ~~supporting~~discussing SCE's renewable ~~procurement need~~compliance;
- Minimum margin of procurement;
- Consideration of price adjustment mechanisms;
- Economic curtailment;
- California Tree Mortality Emergency Proclamation;
- Expiring contracts;
- Cost quantification tables;
- Imperial Valley issues;
- Safety considerations;
- Standard Contract Option using the streamlined Renewable Auction Mechanism ("RAM") procurement tool;
- Green Tariff Shared Renewables ("GTSR") program, in particular the Community Renewables program; and
- Other RPS planning considerations and issues.

SCE takes the RPS program's regulatory framework into account in planning for possible renewable procurement in ~~2015~~2016 and beyond. Senate Bill ("SB") 2 (1x), which took effect on December 10, 2011, ~~made significant changes to the RPS program. Most importantly, in addition~~

~~to increasing~~increased the overall target percentage of procurement from renewable resources from 20% to 33%, ~~SB 2 (1x)~~and departed from the prior structure of annual RPS goals and moved to multi-year compliance periods, with interim procurement targets established for each multi-year compliance period. The Commission has issued several decisions implementing SB 2 (1x), including Decision ("D.") 11-12-020 setting RPS procurement quantity requirements,~~1~~[2] D.11-12-052 implementing the three portfolio content categories of renewable energy products that may be used to satisfy RPS targets,~~2~~[3] D.12-06-038 establishing new compliance rules for the RPS program, and D.14-12-023 setting enforcement rules for the RPS program. The Commission has not yet established a cost limitation for RPS-related procurement expenditures for each electrical corporation. ~~SCE's renewable procurement planning may change as a result of the Commission's adoption of a procurement expenditure limitation mechanism, implementation of other RPS program rules, or other changes to the RPS program. Moreover, the enactment of new laws and/or the implementation of other programs affect SCE's RPS procurement planning. For example, on~~

~~1~~[2] As implemented by the Commission in D.11-12-020, pp. 2-3, the RPS procurement quantity requirements applicable to all retail sellers are as follows: (1) 20% of overall retail sales for the first compliance period from 2011-2013; (2) 21.7% of 2014 retail sales, plus 23.3% of 2015 retail sales, plus 25% of 2016 retail sales for the second compliance period from 2014-2016; (3) 27% of 2017 retail sales, plus 29% of 2018 retail sales, plus 31% of 2019 retail sales, plus 33% of 2020 retail sales for the third compliance period from 2017-2020; and (4) 33% of retail sales in each year thereafter.

~~2~~[3] The first portfolio content category ("Category 1") includes products from renewable generators with a first point of interconnection to the Western ~~Electric~~Electricity Coordinating Council ("WECC") transmission system within the boundaries of a California Balancing Authority Area ("CBA"), or with a first point of interconnection with the electricity distribution system used to serve end users within the boundaries of a CBA, or where the renewable generation is dynamically transferred to a CBA, or scheduled into a CBA on an hourly basis without substituting electricity from another source. The second portfolio content category ("Category 2") includes firmed and shaped products. The third portfolio content category ("Category 3") includes all other renewable electricity products, including unbundled renewable energy credits ("RECs"). Retail sellers are subject to a minimum portfolio content category target (varying by compliance period) for Category 1 products and a maximum portfolio content category target (varying by compliance period) for Category 3 products. The remainder may be satisfied by Category 2 products.

On October 7, 2015, Governor Brown signed SB 350 which, among ~~things~~other significant changes to the RPS program, increases the State's RPS goals~~.[3] In D.15-12-025, the Commission stated that "[s]ince the 2015 RPS Plans do not directly incorporate SB 350's requirements, in 2016 we will address~~ to 50% by 2030. The Commission has not yet issued a decision on the implementation of SB 350's higher RPS targets~~."[4] Consistent with D.15-12-025, SCE has not modified this 2015 RPS Plan to address the requirements of SB 350.~~ and other changes to the RPS program. However, SCE has included SB 350's higher RPS targets in this 2016 RPS Plan assuming that the Commission will use the same methodology adopted in D.11-12-020 to set interim RPS targets.

SCE's renewable procurement planning may change as a result of the Commission's implementation of SB 350's changes to the RPS program, adoption of a procurement expenditure limitation mechanism, or other changes to the RPS program.

~~Through SCE's analysis of its renewable procurement need, as discussed herein, SCE has determined that it has a long-term need for renewable energy. In this 2015 RPS Plan, SCE proposes to conduct a targeted 2015 RPS solicitation that meets SCE's need for renewable resources. Similar to SCE's 2014 solicitation process, SCE proposes a solicitation process that is intended to capitalize on the maturing renewables market and target the most viable proposals that fit SCE's portfolio need and provide the most value to customers. In particular, SCE will continue to require that projects have a Phase II Interconnection Study (or an equivalent or more advanced interconnection status or exemption) and an "application deemed complete" (or equivalent) status within the applicable land use entitlement process in order to submit a proposal. SCE will also solicit Category 1, Category 2, and Category 3 unbundled REC products in order to minimize costs to its customers. Furthermore, SCE will only consider proposals from projects with initial delivery dates to SCE of December 1, 2020 or earlier.~~SCE's analysis of its renewable procurement need is

~~[3] As discussed in Section II, the ACR also directs retail sellers to include consideration of a higher RPS goal in their 2015 RPS Procurement Plans.~~

~~[4] D.15-12-025 at 6.~~

discussed herein. SCE does not have a need for renewable energy at this time to satisfy its RPS program targets. In this 2016 RPS Plan, SCE proposes to hold open the possibility of conducting a targeted 2016 RPS solicitation that would include both a Community Renewables solicitation and a limited solicitation to purchase renewable energy. The purpose of any RPS solicitation SCE may hold would be to reinforce SCE's commitment to clean resources, to consider compelling offers, to solicit resources that meet local reliability need in the Western Los Angeles Basin ("Western LA Basin") or the Goleta area of Santa Barbara County, and to demonstrate support for State environmental policy. Also, if SCE conducts a 2016 RPS solicitation, it may include a solicitation of offers for SCE to sell Renewable Energy Credits ("RECs") of 2016-2020 vintage to allow SCE to optimize its renewables portfolio. Finally, if SCE decides to hold a 2016 RPS solicitation, one of its two required Community Renewables solicitations will be part of the 2016 RPS solicitation.

~~II. CONSIDERATION OF A HIGHER RPS GOAL~~

~~The ACR requires that retail sellers' 2015 RPS Procurement Plans consider both the current 33% by 2020 RPS goal and a 40% by 2024 RPS goal when addressing Specific Requirements for 2015 RPS Procurement Plans.[5] This 2015 RPS Plan considers these two different RPS goals throughout.[6] Except where otherwise indicated, SCE's responses are the same for the two different goals.~~

~~SCE supports the Governor's 2030 climate vision for California to reduce greenhouse gas ("GHG") emissions while maintaining or enhancing safe, reliable, and affordable electric service. SCE recognizes that moving towards the State's long-term GHG emissions goals will require significant investment in additional renewable energy, energy efficiency, and transportation electrification, as well as other measures such as strategic expansion of distributed generation and development of strategies to integrate renewables. Accordingly, SCE supports a comprehensive~~

~~[5] *See* ACR at 5.~~

framework that advances statewide GHG emissions reductions from a combination of these actions.[7] This comprehensive framework should cost-effectively deliver additional GHG emissions reductions, while also encouraging electric sector support and contributions to GHG emissions reductions in other sectors (e.g., transportation) and providing load-serving entities with the flexibility to optimize their portfolio of GHG emissions reduction opportunities for their customers.

While the procurement of renewable energy through the RPS program is an important part of a comprehensive framework that advances statewide GHG emissions reductions, it is premature for the Commission to adopt any RPS target beyond the current 33% by 2020 goal as part of the 2015 RPS Procurement Plan process. The California Legislature is currently examining whether to increase the statewide RPS goal and the role of additional renewables in the State's GHG emissions reduction efforts. Two active bills in the 2015 legislative session, SB 350 and AB 645, propose raising the current 33% RPS goal to 50% by 2030.[8] Increasing the current RPS goal raises challenges associated with renewable integration that have potentially considerable cost implications which must be carefully considered. There are also significant questions regarding how an RPS program with a higher overall goal should be structured to ensure it is workable and effective. Many of these questions will likely be affected or informed if either proposed bill becomes law. The Commission should defer further consideration of an RPS procurement goal beyond 33% until after the Legislature and the Governor finish their examination of these issues.

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[6] As noted above, SCE has not modified its 2015 RPS Plan, including this discussion of consideration of a higher RPS goal, to reflect the enactment of SB 350.

[7] *See, e.g.*, Opening Comments of Southern California Edison Company (U 338-E) on Nine Point Implementation Plan, Rulemaking ("R.") 13-12-010, at 2-4 (January 12, 2015).

[8] After the filing of SCE's original 2015 RPS Plan on August 4, 2015, SB 350 was signed into law on October 7, 2015.

Most importantly, a Commission decision implementing a higher RPS goal at this juncture could conflict with future legislation, creating challenges in implementation and uncertainty regarding which program rules govern which goal. Moreover, any increased RPS goal adopted by the Commission would necessarily apply only to retail sellers, thus resulting in unequal rules for retail sellers and local publicly owned electric utilities that are also subject to the RPS program. In order to ensure fairness, make certain that the State's efforts to support renewables are truly statewide, and avoid efforts that may ultimately be inconsistent with future law, the RPS program should have the same goals and rules for all load-serving entities serving California customers. In addition, as discussed below, changes to the current RPS program rules are needed to implement an achievable and cost-effective RPS program with a higher goal. These changes require legislative action. SCE also notes that all load-serving entities can and should take action to make sure they are well positioned through their renewable procurement to meet the State's goals and anticipate actions needed to meet changing requirements without direct action of the Commission.

For any consideration of a higher RPS goal, SCE offers the following policy considerations. It is important to make these changes in order to create a successful RPS program that will provide all load-serving entities with adequate flexibility to meet increased RPS goals and manage operational issues associated with additional renewable generation on the system, while also minimizing costs for their customers.

Renewable Distributed Generation: The current RPS program rules allow renewable distributed generation ("DG") systems to qualify as RPS-eligible resources and count towards RPS program targets if they meet all RPS eligibility and tracking requirements as set forth by the Commission and the California Energy Commission ("CEC"). While, in concept, RECs from renewable DG could be eligible to count towards RPS goals, administrative and economic hurdles

prevent this from being the case in practice. As California potentially moves towards a higher RPS goal, it is important that all renewable generation, including generation from renewable DG, is accounted for in the State's RPS portfolio.

The main hurdles to counting these RECs towards California's RPS goals are the rules put in place by various agencies. For instance, expensive Western Renewable Energy Generation Information System ("WREGIS") metering and tracking requirements are an unnecessary barrier to counting renewable DG towards RPS targets.[9] WREGIS requires revenue-quality meters to be installed in order to create WREGIS certificates.[10] These meters can cost hundreds of dollars for individual customers to install. The costs of installing these expensive meters and going through many administrative processes are much higher than the value of the RECs from most customers' renewable DG systems, which can be less than $10 in a year. These barriers should be removed and clarified, allowing energy from renewable DG to easily count towards the State's RPS goals. This policy change is best handled through legislation, as a regulatory solution would have to be coordinated across many agencies, would take a considerable amount of time and effort, and may not lead to a viable solution.

Banking Short-Term Products: The current RPS program's compliance framework prohibits banking short-term products associated with contracts of less than 10 years in duration.[11]

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[9] *See, e.g.*, CEC Renewables Portfolio Standard Eligibility Guidebook, Eighth Edition, CEC-300-2015-001-ED8-CMF, at 24-25, 30 (June 2015) ("A facility shall be registered in WREGIS before the Energy Commission will accept an application for certification. . . . A certified facility must remain registered in WREGIS and comply with all WREGIS rules, and all generation must be tracked in WREGIS to be considered RPS-eligible, with the limited exceptions noted in Section III.A.1.a: Creation of Retroactive Renewable Energy Credits in WREGIS.") ("Generation from a certified facility serving onsite load may be claimed for use in the RPS if all eligibility requirements are met and the generation serving onsite load is metered independently from any station service loads using a meter with a verified accuracy rating of 2 percent or higher.").

[10] *See* WECC WREGIS Operating Rules, Rules 9.1 and 9.3 (July 15, 2013).

[11] *See* Cal. Pub. Util. Code § 399.13(a)(4)(B).

Said differently, if a load-serving entity's retired RECs exceed its RPS procurement quantity requirement for a compliance period, all RECs from short-term products above the procurement quantity requirement will be deducted from the load-serving entity's bank. The short-term Category 1, 2, and/or 3 RECs that are in excess of the load-serving entity's procurement quantity requirement are not used for RPS compliance and essentially disappear. This rule harms the customers of load-serving entities that wish to go above and beyond current RPS targets. Customers of these load-serving entities lose the value of RECs that cannot be banked, and ultimately pay higher costs for renewables because these load-serving entities cannot fully utilize lower cost products that are typically sold on a short-term basis.

It is not in the best interests of the State, the Commission, or the renewables market as a whole to create a disincentive for load-serving entities to procure renewable energy beyond their RPS goals for a compliance period. Moreover, a megawatt-hour of renewable energy is still energy generated by a clean renewable resource regardless of whether the underlying contract for such resource meets an artificial threshold for the length of contract. As such, a legislative change is needed that would allow load-serving entities to bank excess short-term products. This would allow all load-serving entities to have access to cost-competitive short-term products in order to reduce costs to their customers. It would also eliminate a disincentive for load-serving entities to exceed RPS targets.

RPS Compliance Period Targets: The active 50% RPS bills being considered in the 2015 legislative session each have proposed different compliance period trajectories to 50% RPS by 2030.[12] When considering RPS targets for each compliance period, lawmakers should establish targets with the intention of reducing costs to customers and providing reasonable flexibility to

load-serving entities with respect to contracting and compliance timelines. SCE provides the following recommended trajectory in an effort to establish a least-cost and timely path to 50% RPS by 2030: 38% by 2023, 43% by 2026, and 50% by 2030. This trajectory repeats the three-, three-, and four-year compliance periods of the current 33% RPS program.

The trajectories for each compliance period should be established through legislation. Current law states that the RPS program reverts to annual targets after 2020.[13] Moreover, the higher RPS targets included in the ACR are annual targets for 2021, 2022, 2023, and 2024.[14] One of the significant benefits of the 33% RPS program was moving away from annual targets towards multi-year compliance periods. It would be a significant drawback for retail sellers under the Commission's jurisdiction to have to meet RPS targets each year, rather than in multi-year compliance periods. Multi-year compliance periods allow retail sellers to better plan for variability in retail sales and renewable generation, as well as to more effectively account for the risk of project failure. Multi-year compliance periods also reduce costs for customers because retail sellers can carry a lower average bank to account for potential risks and ensure compliance when an RPS target covers several years than when the target only covers one year. Further, as noted above, establishing higher annual RPS goals for retail sellers for 2021 through 2024 through Commission action will create unequal rules between retail sellers and local publicly-owned electric utilities since local publicly-owned electric utilities would not be subject to any Commission targets.

While this is a simple distinction between increasing the RPS goals through regulatory versus legislative action, establishing a reasonable RPS target trajectory with multi-year

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[12] SB 350 currently proposes a trajectory of 40% by 2024, 45% by 2027, and 50% by 2030. AB 645 currently proposes a trajectory of 38% by 2023, 44% by 2026, and 50% by 2030.

[13] *See* Cal. Pub. Util. Code §§ 399.15(b)(2)(B)-(C).

compliance periods is very important to achieving higher RPS goals while minimizing costs to customers. For this reason alone, the Commission should wait for legislative action before raising the RPS targets.

Tools to Manage Operational Issues: An increase in California's RPS goal from 33% to 40% or 50% would result in more intermittent resources on the grid and increased deliveries from RPS-eligible resources, likely resulting in an increase in the amount of curtailment of renewable output due to more instances of over-generation. This raises operational concerns regarding the integration of renewable resources. It also affects load-serving entities' ability to comply with the higher RPS targets and the cost of the RPS program to customers.

Currently, customers are paying a premium for curtailed, otherwise RPS-eligible energy that they are unable to count towards RPS targets. For example, in instances when a renewable project is curtailed due to economics (i.e., negative market prices), SCE customers may pay the generator the full price for curtailed energy, but are unable to count that energy toward RPS goals. In other instances, for example when the California Independent System Operator ("CAISO") orders a curtailment due to congestion or over-generation, SCE customers do not pay the generator for curtailed energy, but SCE is similarly unable to count the curtailed energy toward RPS goals. Both scenarios may result in SCE customers paying additional costs for RPS-eligible replacement energy. However, curtailing RPS-eligible energy may still be required to address system issues or avoid paying even higher costs through negative pricing. This issue may be exacerbated as the State's RPS targets increase.

To provide load-serving entities with the tools to address this operational issue, SCE recommends that curtailed energy paid for by a load-serving entity be eligible to count towards

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[14] *See* ACR at 5.

~~RPS targets on or after January 1, 2021. Allowing load-serving entities to count curtailed energy towards the RPS would avoid the scenario in which load-serving entities purchase renewable energy in great excess of their targets in order to account for curtailed energy, resulting in unnecessary cost increases to customers and possibly operational problems with more over-generation on the system. This change to the RPS program would require legislative action.~~

~~**Equal Rules:** The current 33% RPS Program has been inconsistently applied to different types of load-serving entities. For instance, the three large investor-owned utilities ("IOUs") are required to offer feed-in tariffs, such as the Renewable Market Adjusting Tariff ("ReMAT") and the Bioenergy Market Adjusting Tariff ("BioMAT"), and have also been required to conduct additional procurement of renewable resources sized 20 megawatts ("MW") and under through RAM auctions. These programs are not required for other retail sellers. The IOUs' customers pay higher prices in these mandated procurement programs, while customers of non-participating retail sellers are not subject to these same costs. All retail sellers should be required to participate in all programs that contribute to the RPS program. Because many of these procurement programs are required by legislation, it would be appropriate for legislative language to be amended and clarified to promote equal rules, prior to the Commission moving forward with consideration of any RPS procurement target beyond 33%.~~

To the extent SCE conducts a 2016 RPS solicitation, SCE will use a solicitation process that is intended to capitalize on the maturing renewables market and target the most viable proposals that fit SCE's reliability need and provide the most value to customers. In order to submit a proposal, SCE will require that projects have: (1) a Phase II Interconnection Study (or an equivalent or more advanced interconnection status or exemption), unless the resource is located

in the Western LA Basin[4] or the Goleta area,[5] which have a compelling local reliability need; and (2) an "application deemed complete" (or equivalent) status within the applicable land use entitlement process. Because of uncertainty surrounding SCE's long-term load forecast due to potential changes in its load profile (i.e., the effects of electric transportation, local solar photovoltaic ("PV") generation, and departing load), if SCE conducts a 2016 solicitation, SCE will request that all bidders submit one offer for a term of 10 years or less for each project. SCE will also solicit Category 1 products only. Additionally, SCE will only consider proposals from projects with initial delivery dates to SCE of January 1, 2021 or later, unless the resource is located in the Western LA Basin or the Goleta area where there is a demonstrated local reliability need.

If SCE holds a 2016 RPS solicitation, SCE will also request offers from parties interested in purchasing Category 1 or 3 products from SCE. SCE does not forecast a net short position potential until 2023. Therefore, in order to maximize value for customers, SCE may sell vintage 2016 through 2020 Category 1 or 3 products if purchasers present reasonably priced offers. SCE would not sell Category 1 or 3 products if doing so would compromise SCE's renewable position.

II.~~III.~~

ASSESSMENT OF RPS PORTFOLIO SUPPLIES AND DEMAND

A. SCE's Renewables Portfolio

For the first compliance period from 2011 through 2013, SCE served 20.7% of its retail sales from RPS-eligible resources.[~~15~~6] In 2014, SCE served 23.4% of its retail sales from

[4] In D.16-05-053, the Commission found that SCE still needed to procure 169.4 megawatts ("MW") of preferred resources in the Western LA Basin as part of the local capacity resource need that SCE attempted to fill as part of its Local Capacity Requirements Request for Offers ("LCR RFO").

[5] SCE has a significant need for new generation to fill local capacity need in the Goleta area which has insufficient transmission and generation to support continued electric service during a significant emergency event, like a wildfire or mud slide.

[~~15~~6] SCE retired RECs amounting to 20.6% of its retail sales for the first compliance period.

RPS--eligible resources. In 2015, SCE served 24.3% of its retail sales from RPS-eligible resources.

To date, SCE's RPS-eligible deliveries and executed renewable procurement contracts have resulted from SCE's RPS solicitations, SCE's Renewables Standard Contract program, the ~~AB~~Assembly Bill 1969 feed-in tariffs, RAM auctions, the Renewable Market Adjusting Tariff ("ReMAT"), the utility-owned generation and independent power producer ("IPP") portions of SCE's Solar Photovoltaic Program ("SPVP"), the GTSR program,~~16~~7 SCE's Preferred Resources Pilot ("PRP") program, qualifying facility ("QF") contracts, utility-owned small hydro projects, and bilateral opportunities.

SCE is presently initiating actions pursuant to the California Tree Mortality Emergency Proclamation ("Proclamation") issued by Governor Brown on October 30, 2015, as discussed in Section XI below. Those actions are implementation of: (1) the Tree Mortality RAM ("BioRAM") solicitation seeking 20 megawatts ("MW") of capacity from biomass facilities burning trees from High Hazard Zones ("HHZ") for wildfires; and (2) implementation of the Bioenergy Market Adjusting Tariff ("BioMAT") seeking power from small (3 MW or smaller) biomass facilities burning trees from HHZ. Any procurement resulting from BioRAM and/or BioMAT will also be RPS-eligible deliveries.

Between January 2014 and December 2015, SCE executed 26 RAM contracts for approximately 409 MW, 14 ReMAT contracts for approximately 27 MW, 41 SPVP IPP contracts for approximately 64 MW, one GTSR contract for 20 MW, two PRP contracts for 2 MW, and three QF standard offer contracts for approximately 38 MW.~~17~~8 During this period, SCE also executed ~~eight contracts for approximately 1,556 MW from its 2013 RPS solicitation, as well as one bilateral contract for 132 MW and one sale~~ agreement for 2016 deliveries.~~.~~:

~~16~~7 Only RECs associated with unsubscribed GTSR energy deliveries may be used for SCE's RPS compliance. *See* D.15-01-051 at pp. 43-~~44.~~44; Ordering Paragraph 12.

~~17~~8 Of these, ~~two~~six of the RAM contracts totaling ~~38~~98 MW, ~~two~~four of the ReMAT contracts totaling ~~2~~5 MW, and ~~four~~eleven of the SPVP IPP contracts for ~~5~~16 MW subsequently terminated. This information is up to date as of ~~December 31, 2015.~~June 30, 2016.

- 8 contracts for approximately 1,556 MW from its 2013 RPS solicitation;
- one bilateral contract for 132 MW;
- one sales agreement for 2016 deliveries; and
- ~~SCE launched its 2014 RPS solicitation on December 8, 2014. SCE has executed~~ 18 contracts for approximately 2,096 MW from its 2014 RPS solicitation ~~totaling approximately 2,096 MW. SCE may execute~~ [redacted] ~~from its 2014 solicitation~~.

SCE launched its 2015 RPS solicitation on January 29, 2016 and has executed one RPS contract with a contract capacity of 128 MW and two GTSR contracts with a total combined contract capacity of 40 MW. SCE is still actively negotiating contracts for renewable energy [redacted] from that solicitation.

B. SCE's Forecast of Renewable Procurement Need

SCE determines its expected renewable procurement need by comparing its forecasted RPS targets to its forecasted energy deliveries from contracted projects. The forecasted energy deliveries include SCE's probabilistic risk-adjusted forecast of generation from contracted projects that are not yet online. SCE also considers generation from pre-approved procurement programs (i.e., ReMAT, BioMAT), among other factors.~~[18]~~

Appendices C.1 through C.4 include SCE's forecast of its renewable procurement position and need – i.e., SCE's renewable net short ("RNS") – based on the ~~RPS program's 33% by 2020 target. As provided in the ACR, Appendices C.5 through C.8 include SCE's forecast of its RNS based on the 40% by 2024 target set forth in the ACR. Both sets of forecasts include the~~ RPS targets adopted by the Commission in D.11-12-020 for all years through 2020. ~~The difference~~

~~[18] SCE has not yet included generation from BioMAT since SCE has not yet begun procuring under the program. SCE has not included any additional generic generation from the RAM program because the RAM 6 auction has now been completed. Additionally, SCE assumes no additional generic SPVP generation per SCE's Petition to Modify D.14-06-048, filed in A.08-03-015 on January 15, 2016.~~

~~between the two sets of forecasts are the targets for 2022 through 2030. In accordance with the current rules of the RPS program,~~Because of the new 50% by 2030 target established in SB 350, Appendices C.1 through C.4 also include a ~~33% target for all years after 2020. Pursuant to the ACR, Appendices C.5 through C.8 include a 33% target for 2021, a 37% target for 2022 and 2023, and a 40% target for 2024 and all subsequent years.~~ 50% target for 2030 and use the same methodology adopted by the Commission in D.11-12-020 to set targets for 2021 through 2030.

These Appendices use the standardized reporting template included in the Administrative Law Judge's Ruling on Renewable Net Short, R.11-05-005, dated May 21, 2014 ("RNS Ruling").~~19~~9 As required in the Revised Energy Division Staff Methodology for Calculating the Renewable Net Short ("Revised RNS Methodology") attached to the RNS Ruling, Appendices C.~~1, C.2, C.5,~~1 and C.~~6~~2 include physical RNS calculations. ~~Moreover,~~ Appendices C.~~3,~~3 and C.~~4, C.7, and C.8~~4 include optimized RNS calculations.~~20~~10 Appendices C.~~1,~~1 and C.~~3, C.5, and C.7~~3 include physical and optimized RNS calculations using all required assumptions for the Commission's Revised RNS Methodology. Appendices C.~~2,~~2 and C.~~4, C.6, and C.8~~4 include physical and optimized RNS calculations using SCE's assumptions. More information regarding Appendices C.1 through C.~~8~~4 and responses to the RNS questions set forth in the RNS Ruling are included in Section ~~VII~~VI.

All forecasts include projects under contract and assume contracted projects that are currently online will deliver 100% of their expected amount of renewable energy. All forecasts also include generation from pre-approved procurement programs (i.e., ReMAT, BioMAT) at a 100% success rate before contracts are signed.~~21~~11 Additionally, all forecasts incorporate current expected online dates for all projects that are not yet online. ~~As indicated above,~~ SCE is ~~still~~ in the process of completing its ~~2014~~2015 RPS solicitation.

~~19~~9 SCE's forecasts only extend through 2030; therefore, SCE's ~~forecast~~forecasted RNS information is only included through 2030.

~~20~~10 The required information on RECs from expiring contracts is included in Appendix E.

~~21~~11 After contracts from such programs are signed, they are risk -adjusted in the same manner as other projects with executed contracts that are not yet online.

Furthermore, all forecasts account for potential issues that could delay RPS compliance, project development status, minimum margin of procurement, and other potential risks through the use of SCE's probabilistic risk-adjusted success rates for energy deliveries from contracted projects that are not yet online. These probabilistic risk-adjusted success rates are intended to reflect a number of dynamic factors and are periodically adjusted based on new information. The forecasts include individual project-specific, risk-adjusted success rates for large, near-term projects and a flat ~~50~~60% success rate for the remaining projects, which is based on these projects' overall weighted average success rate. The overall probabilistic risk-adjusted success rate for energy deliveries from SCE's portfolio of contracts with projects that are not yet online varies from around ~~75~~89% for the second compliance period to approximately ~~57~~79% in the third compliance period and approximately ~~55~~74% thereafter.

Additionally, SCE adjusted its load and generation forecasts for RPS-eligible energy to remove customer load served under the Green Tariff portion of the GTSR program (called the "Green Rate" by SCE).[12] This is because RECs associated with the load served under the Green Rate do not count toward RPS compliance.[13] Green Rate subscriptions are incorporated into all forecasts assuming that 100% of current Green Rate subscriptions continue indefinitely.[14] At present, because dedicated resources procured to serve Green Rate customers have not yet begun service, SCE transferred other RPS-eligible generation from its Interim Green Rate Pool to serve Green Rate subscribers, until dedicated Green Rate resources are operational, as an offset to existing renewable generation. SCE also reduced its bundled retail sales forecast used to calculate its RPS goals by the amount of energy used to serve Green Rate customer load, as permitted by the GTSR program.[15]

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12 No customers are presently being served under the Community Renewables Rate. As a result, SCE only counted Green Rate customers here.

13 *See* CAL. PUB. UTIL. CODE § 2833(s).

14 Because no customers are presently being served under the Community Renewables Rate, SCE did not make any assumptions about how many customers would be served, in the future, under the Community Renewables Rate.

15 CAL. PUB. UTIL. CODE § 2833(u).

The difference between the RNS forecasts using SCE's assumptions, as reflected in Appendices C.~~2,~~2 and C.4, ~~C.6, and C.8,~~ and the Commission's assumptions, as reflected in Appendices C.~~1,~~1 and C.3, ~~C.5, and C.7,~~ is that SCE uses its most recent bundled retail sales forecast for all years while the Commission's assumptions use SCE's most recent bundled retail sales forecast for ~~2015~~2016 through ~~2019~~2020 and 2025 through 2030, and the standardized planning assumptions that were used in the 2014 Long-~~term~~Term Procurement Plan ("LTPP") for ~~2020~~2021 through 2024.[~~22~~16] SCE uses its own bundled retail sales forecast for renewable procurement planning because it is SCE's best forecast of bundled retail sales.

As shown in Appendices C.1 through C.~~8,~~4, SCE's procurement quantity requirement for the first compliance period was approximately 44.8 billion kilowatt-hours ("kWh") and its RPS-eligible procurement was about 46.4 billion kWh~~, for a~~. The net surplus, less non-bankable procurement, results in the net long position of around 1.6 billion kWh at the end of the first compliance period.

Appendices C.1 through C.~~8~~4 also demonstrate that, using either SCE's or the Commission's assumptions, SCE forecasts a procurement quantity requirement for the second compliance period of approximately [redacted] kWh and RPS-eligible procurement of about ~~55.7~~57.2 billion kWh~~, for a~~. The net surplus, less non-bankable procurement, contributes to the cumulative net long position of around [redacted] ~~kWh~~ [redacted] kWh at the end of the second compliance period.

Using either SCE's or the Commission's assumptions ~~as set forth in Appendices C.2, C.4, C.6, and C.8,~~, SCE forecasts a procurement quantity requirement of approximately [redacted] kWh and RPS-eligible procurement of about ~~92.3~~100.1 billion kWh for the third compliance period~~, for a~~. The net surplus, less non-bankable procurement, contributes

[~~22~~16] The Revised RNS Methodology states that retail sellers can use their own forecasts for bundled retail sales for the first five years and should use the LTPP standardized planning assumptions thereafter. *See* RNS Ruling, Attachment A at p. 25. In Appendices C.~~1,~~1 and C.3, ~~C.5, and C.7,~~ SCE uses its own bundled retail sales forecast for 2025 through 2030 because there is no LTPP forecast for those years.

to the cumulative net long position of around [redacted] ~~kWh. Using the Commission's assumptions as set forth in Appendices C.1, C.3, C.5, and C.7, SCE forecasts a net long position fo~~ [redacted] kWh at the end of the third compliance period ~~of approximately~~ [redacted] ~~kWh~~.

SCE forecasts a net short position in later years under both SCE's assumptions and the Commission's assumptions. Under ~~current 33% RPS program rules~~the 50% by 2030 target and using SCE's assumptions, SCE forecasts a net short position starting in ~~2022~~2023 without the use of bank (as shown in Appendix C.2) and a net short position starting in ~~2027~~2028 with the use of bank (as shown in Appendix C.4). Using the Commission's assumptions, SCE forecasts a net short position starting in ~~2021~~2022 without the use of bank (as shown in Appendix C.1) and a net short position starting in 2027 with the use of bank (as shown in Appendix C.3). Accordingly, SCE does not have a short-term renewable procurement need, but it does anticipate a longer term need for additional RPS-eligible energy.[17]

~~As explained in Section II, it is premature for the Commission to adopt any RPS target beyond the current 33% by 2020 goal as part of the 2015 RPS Procurement Plan process. Considering the 40% by 2024 target as required in the ACR and using SCE's assumptions, SCE forecasts a net short position of approximately 6.3 billion kWh for 2024 without the use of bank (as shown in Appendix C.6) and a net short position of approximately 5.7 billion kWh for 2024 with the use of bank (as shown in Appendix C.8). Using the Commission's assumptions, SCE forecasts a net short position of approximately 6.5 billion kWh for 2024 both with and without the use of bank (as shown in Appendices C.5 and C.7).~~

[17] This conclusion assumes no incremental departing load from Community Choice Aggregation ("CCA") development. City of Lancaster is the only CCA currently accounted for in SCE assumptions for departing load. SCE performs scenario analysis for departing load when making procurement decisions based on the best information available at that time. SCE shares this information with its Procurement Review Group ("PRG") including Energy Division.

C. SCE's Plan for Achieving RPS Procurement Goals

Through its ~~2015~~ 2016-2017 RPS procurement activities, SCE intends to ~~contract~~consider contracts for renewable energy that will help achieve the State's RPS goals, as well as provide needed energy to serve SCE's customers at rates competitive with the market. SCE's ~~2015~~ 2016-2017 RPS procurement activities will take into account: (1) the renewable energy procured through SCE's prior RPS solicitations, including the ~~2014~~2015 RPS solicitation, and other procurement mechanisms, (2) probabilistic risk adjustment of expected generation from executed contracts with projects that are not yet online, ~~and~~ (3) future RPS solicitations and other procurement mechanisms that are expected to take place, ~~including any increased renewable targets which are adopted between now and when SCE selects a 2015 RPS solicitation shortlist. Generally, for 2015, SCE will seek resources to augment those already under contract to fulfill its long-term need~~(4) departing load uncertainty and (5) the cost of procuring renewable energy as compared to the cost of procuring in the market.

As discussed above, SCE does not have a need for renewable energy to meet its RPS targets at this time. However, SCE may conduct a targeted 2016 RPS solicitation for Category 1 product. If SCE ~~plans to~~does launch such a ~~2015 RPS~~ solicitation ~~for long-term Category 1, Category 2, and Category 3 unbundled REC products.~~ , SCE will only consider proposals from projects with initial delivery dates to SCE of ~~December 1, 2020 or earlier. This is consistent with SCE's long-term renewable procurement need. Requiring initial delivery dates to occur by 2020 increases the certainty of those projects meeting SCE's long-term need. As in the 2014 RPS solicitation~~January 1, 2021 or later, unless the resource is located in the Western LA Basin or the Goleta area. As in the 2014 and 2015 RPS solicitations, in order to fill its longer term need, SCE ~~intends to~~would be flexible in its contracting in the ~~2015~~2016 solicitation. For example, SCE may contract with a seller for energy deliveries beginning in ~~2018~~2021 or later but will provide the opportunity for sellers to sell power directly to the market or to a third party until the delivery term begins under the contract with SCE. Also, if SCE conducts a 2016 RPS solicitation, it may include

a solicitation of offers for SCE to sell RECs of 2016-2020 vintage to allow SCE to optimize its renewables portfolio. Finally, if SCE decides to hold a 2016 RPS solicitation, one of the two required Community Renewables solicitations will be part of the 2016 RPS solicitation.

All of the procurement in SCE's current renewables portfolio is from contracts executed prior to June 1, 2010 or contracts for Category 1 products. SCE forecasts that it will meet its RPS targets primarily through long-term Category 1 products because they ~~provide~~provided the most flexibility for SCE's customers. ~~In addition to long-term Category 1 products, SCE will solicit long-term Category 2 and Category 3 unbundled REC products in the 2015 RPS solicitation in order to minimize costs to its customers and gain information on the market for each portfolio content category. Additionally, as discussed in Section XIX.B, SCE may conduct a Request for Information ("RFI"), another solicitation, or bilateral negotiations for short-term Category 1, Category 2, or Category 3 unbundled REC products to realize potential cost savings for customers and obtain additional information on the market for short-term products.~~However, SCE's forecast may evolve in this regard based on the Commission's implementation of SB 350 and the treatment of shorter term contracts and banking rules.

SCE considers its RPS position in light of how long it takes to bring new projects online, SCE's forecasted position, and how many solicitations SCE anticipates being able to complete in order to meet SCE's compliance requirements. SCE then makes a pro rata allocation of SCE's need over the remaining anticipated solicitations. Additionally, SCE generally executes contracts for deliveries in excess of its renewable procurement need to account for the risk of project failure and other relevant risks. This pro rata strategy allows SCE to adjust to changes in the RPS program, including the potential for increased RPS targets, and to respond to changes in load forecasts and/or expected generation from operating and previously contracted renewable resources. ~~If the State's RPS goals were to increase beyond 33% in the future, SCE has several anticipated future solicitations to meet that need.~~

SCE determines its need for resources with specific deliverability characteristics (such as peaking, dispatchable, baseload, firm, and as-available) through its LCBF analysis. SCE uses its

LCBF methodology to compare project profiles, including duration of term, location, technology, online date, viability, deliverability, and price, to estimate the value of each project to SCE's customers and its relative value in comparison to other proposals using both quantitative and qualitative factors. SCE also considers resource diversity with respect to proposals featuring differing technologies, generation profiles, and fuel sources, and performs a qualitative appraisal of the various benefits and drawbacks of projects when considering over-generation and the duck curve.[18] This process ensures that the projects that provide the most value align with SCE's procurement needs. SCE's LCBF approach is described in more detail in Section ~~IX~~VIII.B and Appendix ~~I~~H.1.

In addition to RPS solicitations, SCE will continue to utilize a variety of other procurement options to help meet the State's RPS targets, including ~~the Standard Contract Option using the streamlined RAM procurement tool (discussed in Section XVII),[23]~~ ReMAT, BioMAT, ~~SPVP (until the sunset of that program)~~BioRAM, local capacity requirements solicitations, all source solicitations, PRP, QF standard contracts, and bilateral negotiations for competitive renewable energy products.

~~While SCE does not currently intend to sell bundled renewable energy, unbundled RECs,~~Given SCE's long position in the near term, SCE may solicit offers from interested parties to purchase RECs or other renewable energy products ~~in the 2015~~from SCE, as part of any 2016 RPS solicitation that SCE may decide to hold. The RECs would be of 2016-2020 vintage. Additionally, SCE may conduct a future solicitation or negotiate bilaterally to sell such products to maximize value to its customers and optimize its RPS portfolio.

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[18] The California Independent System Operator ("CAISO") describes the Duck Curve in Fast Facts at - http://www.caiso.com/Documents/FlexibleResourcesHelpRenewables_FastFacts.pdf. In essence, the CAISO points out that as intermittent resources, and particularly solar resources, have a larger role, there is more available generation at mid-day, thus reducing the demand for other generation resources. This is the belly of the duck. Once the sun goes down, there is a need for other quick-ramping resources to become available to serve the growing demand for other generation resources. This is the head of the duck.

~~[23] Additionally, SCE launched its last RAM auction, RAM 6, on July 10, 2015.~~

D. SCE's Portfolio Optimization Strategy

The objective of SCE's renewables portfolio optimization strategy is to minimize costs to its customers while ensuring that RPS goals are met or exceeded. The first step in SCE's portfolio optimization strategy is developing a forecast of SCE's renewable procurement position and need, i.e., SCE's RNS. This includes a calculation of SCE's net position and SCE's bank. SCE carefully evaluates its renewable procurement need by assessing bundled retail sales, the performance and variability of existing generation, the likelihood new generation will achieve commercial operation, expected online dates, technology mix, expected curtailment, and the impact of pre-approved procurement programs, among other factors. Annual variability of existing resources can either increase or decrease SCE's need and bank from year-to-year. However, over longer periods of time, SCE expects generation levels to be relatively consistent.

~~If SCE's renewable need assessment results in a short position, SCE will hold an RPS solicitation if other procurement programs and mechanisms will not fill that position.~~ SCE uses its LCBF methodology to evaluate renewable procurement opportunities as further described in Section ~~IX~~VIII.B and Appendix ~~I~~H.1. The primary quantitative metric used for evaluating bundled renewable energy is Net Market Value ("NMV"). SCE also relies on a number of qualitative factors such as resource diversity and transmission area, among other factors, when evaluating proposals.

~~If~~Because SCE's need assessment results in a long position ~~or it would otherwise optimize SCE's renewables portfolio or maximize value to its customers~~, SCE may use sales of renewable energy products,[~~24~~19] project deferrals, and solicitation deferrals (as it did by not holding a 2012 RPS solicitation) in order to ~~move its renewable~~reduce customer cost while aligning procurement

[~~24~~19] SCE procures renewable energy in compliance with the preferred loading order and when it expects to have a renewable procurement need. SCE does not purchase RPS-eligible energy for the express purpose of selling it at a later date.

~~back in line~~ with its forecasted ~~renewable procurement~~ need. Additionally, SCE actively administers its renewable procurement contracts~~.[25]~~ to manage customer cost.[20]

~~When SCE considers~~SCE evaluates various potential risks when considering whether to engage in sales of renewable energy products~~, SCE compares the NMV for the sales transaction against the NMV of proposals submitted to SCE in recent solicitations and other offers. If the NMV for long-term renewable procurement is lower than the NMV for the sales transaction, it would be more cost effective for SCE to maintain its existing RPS bank for future compliance periods.[26] Conversely, if the NMV from recent solicitations is higher than the NMV for the sales transaction, SCE has an opportunity to optimize its renewables portfolio and realize value for its customers by selling renewable energy products.In addition to the NMV considerations discussed above, SCE evaluates various potential risks when determining its renewables portfolio optimization strategy,~~ including the risk of not meeting its RPS targets. ~~When SCE has a long position in the near and intermediate term, SCE evaluates whether a sale of renewable energy products is appropriate.~~[21] This evaluation includes, without limitation, a calculation of SCE's renewable procurement position and RPS bank with a set of adverse assumptions. ~~These~~Among others, these assumptions include~~, but are not limited to,~~ lower performance of existing resources than expected, lower risk-adjusted project success rates for contracted generation that is not yet online, and higher levels of curtailment than expected. SCE assesses its renewable procurement position with ~~such~~these adverse assumptions to ensure that, even in the worst case scenario, SCE would still expect to meet its RPS targets after making the sale. SCE's overall approach appropriately balances the risks and costs of selling renewable energy products with the risks and costs of maintaining an RPS bank.

~~25~~20 Contract amendments have the potential to decrease contract prices or provide other benefits to customers.

~~26 SCE also considers statutory and regulatory restrictions on banking of excess procurement.~~

21 SCE also considers statutory and regulatory restrictions on banking of excess procurement.

Finally, SCE continues to analyze the effects of procurement of RPS-eligible resources on other procurement programs in order to consider portfolio impacts. The Commission and the California Independent System Operator ("CAISO ~~debated~~") considered flexibility requirements in the Resource Adequacy ("RA") proceeding to help manage the intermittency created on the grid by certain renewable resources. The CAISO launched a stakeholder process to discuss new obligations for flexible capacity and how flexibility requirements will be allocated to load-serving entities. The adopted proposal for allocating flexibility requirements directly allocates the identified requirements based on the amount of intermittent generation contracted by the load-serving entity. This creates a direct link between RPS procurement and flexibility requirements as the amount of wind and solar resources in the portfolio impacts the magnitude of the flexibility requirement allocated to the load-serving entity. A portfolio-wide optimization strategy will need to assess the composition of SCE's renewables portfolio, as resources such as geothermal and other baseload resources may potentially reduce flexibility requirements.

E. SCE's Management of its Renewables Portfolio

After SCE executes an RPS power purchase agreement ("PPA"), the PPA is managed by ~~the~~SCE's Energy Contracts ~~Contract Management group. Many projects~~Management group. Each PPA is assigned a contract manager who serves as the primary point of contact to address all obligations and milestones under the PPA. To the extent allowable, many PPAs will require some form of ~~PPA~~ modification prior to ~~attain~~attaining commercial operation. Modifications ~~include, but are not limited to, specific provisions to aid the seller in reducing the overall costs of the project, ability to true up~~may include financing consents, updates to facility descriptions, amendments that reduce costs to the seller and/or SCE without increasing revenues, true-up of PPA milestones and timelines ~~outlined in the PPA~~ as interconnection and permitting information is updated, and other miscellaneous changes to ~~allow~~accommodate adjustments during the project ~~to move forward~~development process. Generally, ~~projects~~PPAs require ~~very~~ few ~~PPA~~ modifications after attaining commercial operation. At this juncture in the contract lifecycle, contract

administration efforts become more focused on monitoring the contractual performance and payment obligations. However, disputes, settlements, outages, changes to delivery obligations or other issues may arise and are also managed by the same contract managers.

In evaluating modifications or amendments to a PPA, SCE applies guidance from D.88-10-032. Although D.88-10-032 was enacted as a set of guidelines for the administration of QF contracts, SCE has been using it when administering all forms of PPAs. At a high level, D.88-10-032 gave the IOUs the option to determine whether to enter into an amendment with any counterparty.[27][22] In the event an amendment is elected, the IOU should negotiate in good faith.[28][23] D.88-10-032The decision also provides that in response to requests for contract modifications, an IOU is to seek concessions that are commensurate with the change being sought.[29][24] The details of D.88-10-032 provide further guidance to the IOUs to restrict modifications to PPAs with viable projects,[30][25] and reject modifications that would result in creating an essentially new project.[31][26]

As appropriate, SCE also considers the standards of review for PPA amendments set forth in D.14-11-042, including assessment of SCE's renewable procurement need, NMV, contract price, project viability, consistency with Commission decisions, and other required updated information.[32][27]

SCE seeks approval by the Commission of all PPA modifications either through its annual Energy Resource Recovery Account ("ERRA") application or through advice letters or applications, depending on the type of PPA and nature of the amendment, and based on guidance from Commission decisions regarding specific modifications to PPAs.[33][28]

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[27][22] *See* D.88-10-032 at p. 16.
[28][23] *See id*. at Conclusion of Law 8.
[29][24] *See id.* at p. 16, ConclusionConclusions of Law 13-14.
[30][25] *See id*. at p. 17, Conclusion of Law 4, Appendix A at pp. 4-55.
[31][26] *See id*. at p. 26, Conclusion of Law 17.
[32][27] *See* D.14-11-042 at pp. 80-82. The standards of review do not apply to amendments that are minor or non-material. *See id.* at p. 80.
[33][28] For example, the Commission has indicated specific IOU actions regarding amendments to certain terms in tariff-based agreements.

F. Lessons Learned, Past and Future Trends, and Additional Policy/Procurement Issues

1. Lessons Learned and Past and Future Trends

SCE's ~~overall~~ experience in renewable contracting has enabled SCE to negotiate successfully and bring projects online with a variety of counterparties on a diverse array of ~~projects~~technologies. SCE is committed to recognizing the unique characteristics of each situation and working ~~towards~~toward balanced and mutually acceptable agreements. To this end, SCE continues to refine both its RPS solicitation process and its *pro forma* PPA as a result of lessons learned from SCE's extensive experience in contracting for renewable resources and working with developers. Over the course of the last several years, SCE has also incorporated or accounted for several trends in its renewable procurement planning and solicitation process. SCE discusses several of its important lessons learned and significant past and future trends below. Additionally, as SCE has noted in past RPS Procurement Plans, more stringent eligibility requirements, such as the requirement that projects have a Phase II Interconnection Study (or an equivalent or more advanced interconnection status or exemption) and an "application deemed complete" (or equivalent) status within the applicable land use entitlement process in order to submit a proposal, have resulted in higher viability project proposals. SCE intends to continue these requirements ~~in the 2015~~should SCE conduct a 2016 RPS solicitation for all projects, except those that are located in the Western LA Basin or Goleta area.

a) ~~Elimination of Pre-Paid Economic Curtailment Bidding~~ Possible Future Trend Toward Departing Load

~~In the 2014 RPS solicitation, SCE required sellers to submit two prices per proposal based on SCE discretionary curtailment orders:~~

- Price 1: Sellers offer pricing based on SCE having the right to issue unpaid Curtailment Orders[34] for a quantity of curtailed energy equal to 50 hours times the contract capacity in each term year (the "curtailment cap"). Any Curtailment Order resulting in curtailed energy in excess of the curtailment cap would be paid at the contract price.
- Price 2: Sellers offer pricing based on SCE having to pay the contract price for all Curtailment Orders.

While SCE did select some Price 1 option proposals in its 2014 RPS solicitation, the data SCE received on Price 1 type projects indicates that pre-payment for economic curtailment may not provide the best value to SCE's customers. As market dynamics continue to change and an increasing amount of intermittent resources integrate into the grid, SCE continues to assess how best to maximize the value of economic curtailment provisions in existing PPAs. With respect to existing PPAs that allow SCE to curtail without payment up to the curtailment cap, SCE has been using and will continue to use this provision. However, SCE's experience to date suggests that the added administrative burden and operational complexity associated with intra-month (and even intra-day) tracking of economically curtailed energy, and the potential need to modify bidding strategies once the curtailment cap is reached, may not justify any perceived benefit of "unpaid" economic curtailments. This is compounded by the likelihood that rational sellers have "priced in" the cost of these curtailments. Therefore, the curtailment cap represents pre-paid economic curtailment, not true unpaid economic curtailment. Also, with respect to the 2014 RPS solicitation, in many instances pre-payment of economic curtailment did not appear to be the best economic decision.

[34] Curtailment Order was defined in Section 3.12(g)(iii) of SCE's 2014 *Pro Forma* Renewable Power Purchase and Sale Agreement.

~~Given the uncertain value pre-payment of economic curtailment represents, SCE will not require sellers to bid the pre-paid economic curtailment option with the curtailment cap in the 2015 RPS solicitation. By doing so, SCE will continue to evaluate how to simplify operational and administrative processes while still retaining the flexibility to manage customer exposure to negative prices both day-ahead and in real-time.~~

~~SCE will retain the right to curtail at its discretion, but will pay sellers for curtailments directly resulting from SCE marketing decisions. As in prior years, SCE will not pay for curtailments in response to emergencies, or due to CAISO or transmission provider instructions.~~

Various parties have made statements in public forums, including in public comments in Commission proceedings,[29] about their interest and intention in developing a Community Choice Aggregation ("CCA") program in their local jurisdiction. These entities have the potential to represent a significant departure of load from SCE's bundled service. In addition, the City of Lancaster recently formed a CCA and most customers in the City of Lancaster departed utility bundled procurement service in SCE's service area. If future additional large departures were to come to fruition, they could have proportionally significant impacts on SCE's progress towards meeting its RPS compliance goals, reducing SCE's potential RPS need.

Departing load should not impact SCE's planned procurement activities unless and until new load-serving entities ("LSEs") formalize their departure through a Binding Notice of Intent ("BNI").[30] SCE has not received any BNIs for new CCAs since the City of

[29] A.14-05-024, Comments of Marin Clean Energy, Sonoma Clean Power, The City of Lancaster, The City and County of San Francisco, The County of Los Angeles, Lean Energy US, Clean Coalition, and Communities for a better environment Comments on the Draft Workshop Report, p. 2, filed June 20, 2016.

[30] SCE Tariff Rules, Rule 23.2(A)(1).

Lancaster formed its CCA, and, therefore, is not altering its procurement plan at this time.[31] However, if such load departures materialize, SCE will consider how these departures impact its RPS compliance, including its need for additional resources.

Moreover, if a sufficiently large amount of SCE's current bundled service customers depart bundled service, SCE may be significantly over-procured to meet its RPS compliance goals. In this case, the existing Power Charge Indifference Adjustment ("PCIA") mechanism might be insufficient to protect the remaining bundled customers from rate impacts due to these departures and thus fail to meet the Commission standard of maintaining "bundled customer indifference."[32] If the existing PCIA is found to be insufficient to protect bundled service customers from rate impacts, the Commission should reconsider how to equitably and appropriately allocate the costs and benefits of RPS procurement performed on behalf of those customers among all customers, bundled and unbundled, in a future proceeding. The Commission should be prepared to make necessary changes to ensure that remaining bundled customers are indeed indifferent to departing load.[33]

Finally, as the potential for departures from bundled service increases, the Commission should consider the cost impacts of special purpose above-market, RPS procurement. Examples include: BioRAM, ReMAT, and BioMAT. Because only the IOUs undertake this procurement and only bundled service customers fund such programs, as customers depart from bundled service, the remaining bundled service customers will be disproportionately affected by the costs of these programs. To ensure equitable allocation of these costs, particularly as increases in departing load materialize, it will be important to develop a way to support necessary special

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31 SCE performs scenario analysis for departing load when making procurement decisions based on the best information available at that time. SCE shares this information with its PRG, including Energy Division.

32 CAL. PUB. UTIL. CODE §§ 365.1, 366.

33 See, e.g. CAL. PUB. UTIL. CODE §366.2(d)(AB 117, 2002) requiring all customers to bear a fair share of utility procurement costs incurred on their behalf to avoid cost shifting.

purpose RPS programs without unfairly burdening bundled service customers. SCE provides its significant proposed changes to its RPS Plan in Section XV below.

b) ~~Valuation of Transmission Costs for Projects Located Within and Outside the CAISO Control Area~~One Offer Must Have a Term Length of 10 Years or Less

~~In past RPS solicitations, SCE included the full reimbursable transmission network upgrade costs in the quantitative valuation process for projects directly connected to the CAISO control area. Additionally, SCE included reimbursable transmission network upgrade costs outside the CAISO as a qualitative factor in the LCBF evaluation process for projects not directly connected to the CAISO control area, but where California customers will pay for the costs. SCE took the approach of evaluating the total cost of new build renewable projects from a societal perspective, thereby factoring in 100% of the reimbursable transmission network upgrade costs for any new project located within California or directly connected to the CAISO control area via a CAISO interconnection study. However, other utilities in California have not been factoring in costs from the perspective of all California customers; instead, they have only been valuing reimbursable transmission network upgrade costs relative to their own customers. This could put SCE's customers at a disadvantage because other utilities may be executing renewable contracts for lower contract prices than SCE because the reimbursable transmission network upgrade costs that are not paid by those utilities' customers were not considered in the valuation of the contracts, while SCE was considering costs not paid by its customers in its valuation.~~

If SCE conducts a 2016 RPS solicitation, SCE will allow bidders to propose terms of any length. However, SCE will require bidders to provide at least one proposal per project with a term length of 10 years or less. Given SCE's long RPS position and uncertainty regarding departing load, SCE prefers shorter delivery terms. Signing shorter term contracts now

means that SCE's customers are not contractually bound to as many longer-term contracts. As a result, if SCE's bundled load decreases and concomitantly its renewable position becomes significantly longer, SCE's bundled customers would have to pay for fewer longer term renewable contracts. This is especially important given the possibility of CCA load departure. Also, renewable technologies are continuing to evolve and improve, and prices may continue to decline given the continued efficiencies bidders are receiving through their projects. Shorter terms allow SCE to better take advantage of these technological advances through quicker contract cycles. Finally, shorter-term contracts support the continued operation of existing RPS resources that may not be able to support longer-term (20 year) extensions.

~~Therefore, for the 2015 RPS solicitation, SCE will only consider reimbursable transmission network upgrade costs for projects directly interconnecting to the CAISO control area in the LCBF evaluation process. In addition, SCE will only consider the share of the reimbursable transmission network upgrade costs that are paid by SCE customers.~~SCE made a similar request in its original 2015 RPS Procurement Plan. The Commission denied this request in D.15-12-025 indicating that requiring projects to offer a 10-year PPA length would unnecessarily constrain the market.[34] SCE's 2015 RPS Procurement Plan showed that SCE had a need for new eligible renewable resources. In this 2016 RPS Procurement Plan, primarily due to a reduced load forecast and SCE's procurement from its 2015 RPS solicitation, SCE has no need for new eligible renewable resources. In addition, there is a possibility that SCE's need could be further reduced by more CCA formation in its service area. Since D.15-12-025 was issued, the City of Lancaster formed its CCA and departed utility service. As a result, there is a greater value now for SCE to enter into shorter-term contracts. It will not constrain the market for project developers to offer 10-year contracts, as all developers will be competing on the same basis. In fact, it will expand the number of bids that SCE might consider because there will be more 10-year contracts for SCE to choose from.

[34] D.15-12-025, pp. 95-96.

~~c) Limiting Sellers to Eight Proposals Per Project~~

~~Historically, SCE has not limited the amount of proposals sellers could bid for the same project. As a result, sellers could submit an unlimited amount of proposals in multiple ways. In the 2014 RPS solicitation, some sellers offered the same project in more than 20 variations, which increased the complexity of the complete and conforming verification process and introduced challenges for SCE and the sellers to determine mutual exclusivity. In the 2015 RPS solicitation, SCE will limit the number of proposals submitted on a "per project" basis to eight.~~

~~Limiting sellers to eight proposals from the same project provides sellers with adequate opportunity to submit proposals with variables that are specific to those projects and will provide SCE a robust pool of projects and proposals to select. The eight proposals will provide sellers the opportunity to propose different contract capacity bids (project sizes) or other seller-specific pricing variations. At the same time, limiting the proposals to eight per project will decrease complexity for both sellers and SCE during the verification and valuation process.~~

2. Additional Policy/Procurement ~~Impacts~~Issues

a) SCE Will Consider the Need for RPS Resources to Meet Local Reliability Need in the Western LA Basin and Goleta Areas

On February 13, 2013, the Commission issued D.13-02-015, the LTPP Track 1 decision, which authorized SCE to procure between 1,400 and 1,800 MW of electrical capacity in the Western Los Angeles sub-area of the Los Angeles basin local reliability area ("Western LA Basin ~~sub-area~~") and 215 MW to 290 MW of electrical capacity in the Moorpark sub-area ~~of the Big Creek/Ventura local reliability area~~ to meet local capacity requirements ("LCR") by 2021 due to the expected retirement of once-through cooling units. Pursuant to D.13-02-~~015~~015, SCE was required ~~SCE~~ to procure minimum amounts of gas-fired generation,

~~Preferred Resources~~preferred resources (including renewable resources), and energy storage in the Western LA Basin. There were no technology-specific requirements in the Moorpark sub-area. SCE commenced its LCR Request for Offers ("RFO") on September 12, 2013. The LCR RFO was open to all technologies that could meet SCE's LCR needs, including renewable resources.

On March 13, 2014, the Commission issued D.14-03-004, the LTPP Track 4 decision, which authorized SCE to procure an additional 500 to 700 MW of capacity in the Western LA Basin sub-area due to the retirement of the San Onofre Nuclear Generating Station. Combined, D.13-02-015 and D.14-03-004 authorized SCE to procure between 1,900 and 2,500 MW of capacity in the Western LA Basin~~ sub-area. The LTPP Track 4 decision did not address or change the authorized procurement for the Moorpark sub-area.~~.

~~The LTPP Track 1 and 4 decisions ordered SCE to file separate applications for the approval of all contracts entered into as a result of SCE's LCR RFO for new capacity in the Western LA Basin and Moorpark sub-areas. SCE filed the Western LA Basin Application 14-11-012 on November 21, 2014 to seek Commission approval of 63 contracts executed for a total of 1,882.60 LCR MW.[35] SCE filed the Moorpark Application 14-11-016 on November 26, 2014 to seek Commission approval of 11 contracts executed for a total of 274.16 LCR MW. The Western LA Basin and Moorpark Applications are currently pending final, non-appealable Commission approval.~~

~~Consistent with D.13-02-015 and D.14-03-004,~~On November 21, 2014 and November 26, 2014, respectively, SCE filed applications, A.14-11-012 and A.14-11-016, respectively, requesting approval of the results of its LCR RFOs for the Western LA Basin and the Moorpark, Goleta area. D.15-11-041 approved the results of the LCR RFO for the Western LA Basin and found no need for further procurement. However, D.16-05-053, the decision denying

~~[35] To clarify, the LCR MW are a resource's contribution to the LCR need in August 2021. This may differ from the MW quantity specified in the contract.~~

the applications for rehearing, modified D.15-11-041 to require SCE to meet the preferred resource minimum procurement authorization established in D.14-03-004. As a result, SCE is required to procure an additional 169.4 MW of preferred resources in the Western LA Basin, which SCE can procure through Commission authorized procurement mechanisms. Consistent with D.16-05-053, SCE's ~~2015~~2016 RPS Procurement Protocol solicits projects in the Western LA Basin ~~sub-area~~ to participate in the ~~2015~~2016 RPS solicitation, if it is conducted. Additionally, projects located in the Western LA Basin ~~sub-area~~ that are interconnected to SCE's distribution system served by the Johanna and Santiago substations may also meet SCE's PRP goal.[35]

D.16-05-053 approved the contracts submitted for approval in the Moorpark sub-area and found no further need for LCR procurement in that sub-area. But, the Commission left the docket open to consider the need for the Ellwood generation and linked storage contract to maintain reliability in in the Goleta area.[36] ~~SCE's 2015 Procurement Protocol also solicits projects that are interconnected at a location that electrically connects to the Goleta substation. Projects in this area are preferential as they may help enhance the reliability in the Santa Barbara area, which has been an ongoing concern for SCE as was highlighted in the LCR RFO.~~ That said, there remains a need for new resources to support operation of the electric system in the Goleta area in an emergency situation because of a lack of either generation or transmission resources in the area.[37] SCE submits that it should act to fill this need as soon as possible. If SCE goes forward with a 2016 RPS solicitation, SCE will solicit renewable resources in the Goleta area to participate in this solicitation.

Because of the critical need for local reliability resources in the Western LA Basin and the Goleta area, SCE will not require projects in those areas to have a Phase II

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[35] *See* D.14-03-004. More information on the PRP is available at http://on.sce.com/preferredresources.

[36] ~~*See*~~ D.~~14~~16-~~03-004. More information on the PRP is available at http://on.sce.com/preferredresources.~~05-053, pp. 26-32.

[37] *Id.* at pp. 28-29.

Interconnection Study and will seek to contract with such resources starting before January 1, 2021.

To the extent SCE receives proposals for projects in ~~these areas~~the Western LA Basin and Goleta area that are not selected in SCE's RPS solicitation based on LCBF selection criteria, SCE will consider the value of these proposals using the LCR selection process and criteria.~~37~~ Only projects that provide RA benefits and are able to obtain a CAISO Net Qualifying Capacity assignment will be considered for purposes of meeting SCE's LCR in the Western LA Basin ~~sub-~~and Goleta area. SCE may, in ~~SCE's~~its sole discretion, decide to enter into bilateral contracts with some of these projects based on their LCR value. If SCE does enter into any such contracts, it will submit them for Commission approval through a separate application or advice letter, as appropriate.

III.~~IV.~~

PROJECT DEVELOPMENT STATUS UPDATE

Appendix B contains a status update on the development of RPS-eligible projects currently under contract, but not yet delivering generation.[38] SCE received some of the information in this status update from its counterparties. The status of these projects impacts SCE's renewable procurement position and procurement decisions. For instance, SCE adjusts its renewable procurement position ~~and need~~ during the development stage of a project once it is determined the project will or will not meet its contractual obligations through its forecast probabilistic risk-adjusted success rates.

~~37 SCE plans to use a similar approach in future SPVP solicitations or other applicable solicitations.~~

38 The ~~2014~~2015 RPS solicitation contracts and contracts executed after the filing of SCE's original 2015 RPS Plan on August 4, 2015 are not included.

IV.~~V.~~

POTENTIAL COMPLIANCE DELAYS

Five primary factors will challenge SCE's achievement of the ~~State's~~ RPS goals: (1) curtailment; (2) the increasing proportion of intermittent resources in SCE's renewables portfolio; (3) permitting, siting, approval, and construction of both renewable generation projects and transmission; (4) a heavily subscribed interconnection queue; and (5) developer performance issues. SCE discusses each of these potential issues that could cause compliance delays below and describes the steps it has taken to mitigate the effects of these challenges.

As discussed in Section ~~III~~II.B, in forecasting its renewable procurement position and need, SCE accounts for potential issues that could delay RPS compliance, project development status, minimum margin of procurement, and other potential risks through the use of probabilistic risk-adjusted success rates for energy deliveries from contracted projects that are not yet online. SCE considers the factors discussed below in this process.

A. Curtailment

As more renewable generation comes online, congestion at the transmission and distribution levels ~~is increasing and curtailment events are becoming~~can become more common. Several of SCE's contracted wind projects in the Tehachapi region in Kern County, California, for example, have ~~been forced~~had to curtail deliveries ~~significantly in order~~ to maintain system reliability in this area. Similarly, many projects in the Antelope and Devers areas have been required to curtail in order to accommodate outages needed for system maintenance and upgrades.

While the upcoming West of Devers ("WOD") upgrade project is necessary in order to provide sufficient transmission capacity to meet the 33% ~~RPS (or potentially higher~~by 2020 and 50% by 2030 RPS goals~~)~~, curtailment during WOD construction is expected. This expectation of curtailment was disclosed to renewable resources seeking to interconnect to WOD-impacted areas before interconnecting them to the system. However, many of these resources elected to interconnect prior to the completion of the WOD upgrade. Delays in the completion of the WOD

upgrade project would increase the amount of curtailment as more resources are added. SCE is evaluating different construction sequence alternatives to minimize the curtailment of renewables. The completion of the WOD project ~~will help meet the 33% RPS goal, and~~ will provide additional transmission capacity that could be utilized to accommodate future generation to meet ~~a 40% or~~the 50% RPS goal.

~~An~~The increase in California's RPS goal from 33% to ~~40% or~~ 50% ~~would~~will result in more intermittent resources on the grid and increased deliveries from RPS-eligible resources, likely resulting in ~~an increase in the amount of~~more curtailment of renewable output due to ~~more instances of~~ over-generation and possible exacerbation of the problems discussed above.

SCE has been working on multiple fronts to mitigate the risk of curtailment. SCE has continued working to increase the level of coordination with generators during the construction phases of major transmission projects in the Tehachapi, Lugo, and Devers areas, with a particular focus on minimizing the duration of outages that will require curtailments and scheduling work during periods of low production for renewable resources. Further, SCE is developing strategies to utilize economic curtailment rights to enable CAISO to more efficiently achieve generation reductions when and where needed to alleviate congestion in the course of normal operations, and during transmission outages and periods of over-generation. This ~~should help to minimize curtailment, as this~~ practice will enable the CAISO to fold renewable resources more directly into market optimization runs.

SCE has had some success reducing curtailment at the distribution level, in part by completing needed system upgrades, but also by giving SCE switching center operators better tools to monitor real-time production levels during outages. This increased visibility enables operators to take more targeted action when generators exceed pro rata limitations, and to more effectively manage aggregate limits in the event not all resources are generating their full pro rata share. SCE will continue to look for opportunities to mitigate the impacts of curtailment on meeting RPS goals.

B. Increasing Proportion of Intermittent Resources in SCE's Renewables Portfolio

Over the last several years, a number of large wind projects in SCE's renewables portfolio (among others, the Alta Wind and Caithness Shepherds Flat projects totaling nearly 2,400 MW) have achieved commercial operation. While these resources have contributed significantly toward SCE's renewables portfolio, they have also made forecasting SCE's renewable procurement position and need more complex. Wind generation is difficult to predict. Actual production from wind generators varies significantly from hour-to-hour, month-to-month, and year-to-year, thereby exposing SCE to large fluctuations in renewable energy deliveries. Although not as unpredictable as wind generation, solar production also varies over time depending on weather conditions and project performance, among other factors. As wind and solar projects come to represent an ever larger proportion of SCE's renewables portfolio, these effects will be magnified, particularly ~~if~~with California's RPS target ~~increases~~increasing to ~~40% or~~ 50%, which ~~would~~will result in more wind and solar projects in SCE's renewables portfolio.

Given the number of intermittent resources expected to achieve commercial operation in the coming years, SCE is preparing to successfully integrate new wind and solar resources. For example, SCE is working on ways to improve forecasting accuracy by collecting actual generation data from new wind and solar resources and analyzing forecasted output versus actual production after-the-fact. SCE is also seeking to maintain a balanced portfolio, while keeping customer cost in mind, in order to ensure there is sufficient diversity of renewable resource types to manage intermittency risk going forward.

C. Permitting, Siting, Approval, and Construction of Renewable Generation Projects and Transmission

~~Although the CAISO has identified transmission necessary to meet California's 33% RPS goal,[39] the~~The lack of sufficient transmission infrastructure and the process for permitting and approval of new transmission lines continues to be a challenge to reaching the State's renewable energy targets. Lack of adequate transmission infrastructure and the lengthy process of siting, permitting, and building new transmission continues to impede bringing new renewable resources online.

As stated in the CAISO's ~~2014~~ 2015-2016 Transmission Plan, "[t]he transition to greater reliance on renewable generation has created significant transmission challenges because renewable resource areas tend to be located in places distant from population centers."[40]39 Through its transmission planning process, the CAISO utilizes renewable resource portfolios from the Commission and the CEC to identify transmission projects that will support the development of renewable resources in areas where they are most likely to occur. This "least regrets" approach helps to address an element of uncertainty that generation developers may have regarding the approval of transmission projects that are necessary for the delivery of renewable energy. While some transmission projects have already been approved or are progressing through the Commission approval process,[41] challenges still remain regarding the completion of those transmission projects. In SCE's service area, there are several major transmission projects included in the CAISO's ~~2014~~ 2015-2016 Transmission Plan that SCE is pursuing that will contribute to supporting the State's RPS goals. These projects include the Tehachapi Renewable Transmission Project, ~~West of Devers,~~WOD, Delaney – Colorado River 500 kV line, Devers-Mirage 230 kV line, Lugo – Eldorado ~~Mohave and Eldorado Moenkopi~~ 500 kV Line

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~~[39] *See* CAISO's 2014 2015 Transmission Plan at 11 (March 27, 2015) (available at: http://www.caiso.com/Documents/Board-Approved2014_2015TransmissionPlan.pdf).~~

~~[40] *Id.*~~[39] CAISO 2015-2016 Transmission Plan, at ~~8.~~p. 6.

~~[41] *See id.* at 10–11.~~

~~Swap~~reroute, Lugo-Eldorado series cap and terminal equipment upgrade, the Sycamore – Penasquitos 230 kV line, and the Lugo-Mohave series capacitors~~, and the Mesa Loop-in~~ project.~~42~~40

The long and complicated permitting process for renewable generation facilities is also a barrier to meeting RPS goals. Moreover, environmental concerns, legal challenges, and public opposition can impact the timeline for bringing renewable generation projects online.

D. A Heavily Subscribed Interconnection Queue

A heavily subscribed CAISO interconnection queue is also a major barrier to achieving the State's RPS goals. As of June ~~18, 2015,~~3, 2016, the CAISO reported more than 100 active renewable projects seeking interconnection to the CAISO controlled grid ~~with a completed Phase II Interconnection Study. These projects represent~~representing more than ~~11,000 MW in the queue.~~43 20,000 MW of capacity.[41]

~~Over the last several years, the CAISO has initiated and obtained Federal Energy Regulatory Commission ("FERC") approval to improve its generation interconnection process. These improvements include a fundamental change that integrated the formerly separate and distinct generator interconnection and transmission planning processes, now collectively known as the Generator Interconnection and Deliverability Allocation Procedures ("GIDAP").~~44 ~~GIDAP integrated the CAISO's generator interconnection and transmission planning processes to allow~~

~~42 Regarding the Mesa Loop-in project, the~~40 *Id.* at 276 CAISO's ~~2013-2014 Transmission Plan states that "[w]ith the addition of 500kV voltage, a new source from bulk transmission will be established in the LA Basin to bring power from Tehachapi renewables or power transfer from PG&E via WECC Path 26." CAISO's 2013-2014 Transmission Plan at 107 (March 25, 2014) (available at: http://www.caiso.com/Documents/Board-Approved2013-2014TransmissionPlan.pdf)~~2015-2016 Transmission Plan is available at: https://www.caiso.com/Documents/Board-Approved2015-2016TransmissionPlan.pdf.

~~43~~41 *See* https://www.caiso.com/Documents/ISOGeneratorInterconnectionQueue.pdf.

~~44 See FERC Docket No. ER-12-1855-000.~~

~~the CAISO to more efficiently determine transmission upgrades needed to meet California's RPS goals.~~

~~SCE supports GIDAP. It provides a good foundation for improving the queue management process going forward, but a number of near-term challenges remain.~~ The large number of interconnection requests, particularly from renewable generators, presents significant challenges for SCE, the CAISO, and renewable generators. Generators that have completed their studies, but not signed generation interconnection agreements, contribute to the uncertainty around available system capacity. When capacity is reserved for generators that have not signed interconnection agreements, other potentially more viable later-queued generators can appear to trigger upgrades that may not be necessary. Although protocols exist to allow the removal of languishing generators from interconnection queues, these protocols are difficult to implement because they can lead to litigation.

E. Developer Performance Issues

Achieving California's renewable energy goals also depends on the successful performance of renewable developers in meeting contractual obligations, timely completing construction milestones, and achieving commercial operation. Hurdles encountered during these activities require developers to alter their milestone schedules. This can result in delays, lengthy contract amendment negotiations, and contract terminations. For example, several of SCE's contracts have terminated due to developer performance issues (e.g., poor site selection, failure to timely secure the necessary permits, and inability to complete CAISO new resource implementation processes in a timely manner). To the extent that delays, termination events, and under-performance occur, the amount of delivered energy on which SCE can rely to reach the State's goals is reduced.

To proactively address developer performance issues, SCE continues to reach out to and communicate with project developers on a regular basis, discuss options and the status of project

development, and provide guidance and direction as appropriate. In response to lessons learned in previous solicitations, SCE has also made several modifications to its solicitation materials. The two most relevant updates to solicitation requirements were implemented in the 2014 RPS solicitation in the form of a Phase II Interconnection Study requirement and the Commission-mandated "application deemed complete" requirement with respect to project permitting. These two requirements have significantly contributed to greater viability in the pool of projects bid into the solicitations. In particular, projects that have achieved this level of development typically have significant dollars invested and secured project-backing, which in most cases has already identified and resolved potential fatal flaws in project location, technology, or environmental factors.

In any 2016 RPS solicitation, SCE will implement an exception to the requirement of a Phase II Interconnection Study for resources located in the Western LA Basin and the Goleta areas where there is a local reliability need. For resources in these areas, a Phase I Interconnection Study will be sufficient to encourage as many projects as possible to submit bids. SCE will carefully consider the viability of projects in these areas that do not have a Phase II Interconnection Study.

V.~~VI.~~

RISK ASSESSMENT

SCE describes risks that may result in compliance delays in Section ~~V~~IV. As explained in Section ~~III~~II.B, in forecasting its renewable procurement position and need, SCE accounts for potential issues that could delay RPS compliance, project development status, minimum margin of procurement, and other potential risks through the use of probabilistic risk-adjusted success rates for energy deliveries from contracts that are executed but not yet online. SCE considers these risk factors in this process. Additionally, SCE takes into account historic generation from existing resources, including lower than expected generation, variable generation, and resource availability, among other factors, when forecasting expected generation from its contracted

renewable projects. The quantitative analysis provided in Appendices C.1 through C.~~8~~4 reflects these considerations.

VI.~~VII.~~

QUANTITATIVE INFORMATION

A. RNS Calculations

As discussed in Section ~~III~~II.B, Appendices C.1 through C.4 include SCE's RNS calculations using the standardized reporting template included in the RNS Ruling under the ~~current 33%~~ RPS program rules. ~~As required by the ACR, SCE has also included RNS calculations under the 40% target set forth in the ACR in Appendices C.5 through C.8.~~ As required by the Commission's ~~Revised~~ RNS Methodology, Appendices C.~~1, C.2, C.5,~~1 and C.~~6~~2 include physical RNS calculations and Appendices C.~~3,~~3 and C.~~4, C.7, and C.8~~4 include optimized RNS calculations.

Appendices C.~~2, C.4, C.6,~~2 and C.~~8~~4 include SCE's physical RNS and optimized RNS through 2030, based on the following SCE assumptions:

- SCE's most recent bundled retail sales forecast for ~~2015~~2016 through 2030 which excludes Green Rate customers;
- Contracted projects that are currently online will deliver 100% of their expected amount of renewable energy;
- Probabilistic risk-adjusted success rates for energy deliveries from contracted projects that are not yet online. SCE's forecasts include individual project-specific, risk-adjusted success rates for large, near-term projects and a flat ~~50~~60% success rate for the remaining projects, which is based on these projects' overall weighted average success rate; and

- 100% success rate for projects originating from pre-approved programs such as ReMAT and BioMAT before contracts from such programs are signed.[45][42]

Appendices C.~~1, C.3, C.5,~~1 and C.~~7~~3 provide SCE's physical and optimized RNS through 2030 using the Commission's ~~Revised~~ RNS Methodology. Appendices C.~~1,~~1 and C.~~3, C.5, and C.7~~3 use the same assumptions as in Appendices C.~~2,~~2 and C.~~4, C.6, and C.8~~4 except that:

- Instead of using SCE's most recent bundled retail sales forecast for all years, ~~it uses~~they use SCE's most recent bundled retail sales forecast for ~~2015~~2016 through ~~2019~~2020 and 2025 through 2030 and the standardized planning assumptions that were used in the 2014 LTPP for ~~2020~~2021 through 2024.[46][43]

At this time, SCE does not propose including a voluntary margin of over-procurement ("VMOP") in its renewable procurement planning. SCE will account for ~~additional~~RPS need forecasting risks through the ~~use of~~identification and forecast of RECs above its RPS procurement quantity requirements based on its forecast RPS portfolio.

B. Response to RNS Questions

SCE provides the following responses to the RNS questions included in Appendix D to the RNS Ruling.

[45][42] After contracts from such programs are signed, they are risk -adjusted in the same manner as other projects with executed contracts that are not yet online.

[46][43] The Revised RNS Methodology states that retail sellers can use their own forecasts for bundled retail sales for the first five years and should use the LTPP standardized planning assumptions thereafter. *See* RNS Ruling, Attachment A at p. 25. In Appendices C.~~1,~~1 and C.3, ~~C.5, and C.7,~~ SCE used its own bundled retail sales forecast for 2025 through 2030 because there is no LTPP forecast for those years.

1. **How do current and historical performance of online resources in your RPS portfolio impact future projection of RPS deliveries and your subsequent RNS?**

~~The current and historical performance of online resources in SCE's renewables portfolio is considered when making future projections of RPS-eligible deliveries. Specifically,~~ SCE considers weather and specific resource conditions, including maintenance issues, degradation of output, and contractual issues that have impacted historic performance and may cause the output of a facility to be different than what SCE anticipates for the future. SCE takes these considerations into account when it is forecasting its RNS. In particular, if SCE determines any of these conditions will impact a facility's future generation, such generation will be increased or decreased in the forecast for as long as SCE expects the situation to persist. SCE reviews these conditions on a regular basis and updates its generation forecast accordingly.

2. **Do you anticipate any future changes to the current bundled retail sales forecast? If so, describe how the anticipated changes impact the RNS.**

There are many factors that can impact SCE's bundled retail sales forecast. Those factors include, but are not limited to, demographic and macroeconomic drivers, electricity prices, impact from utilities' energy conservation programs, federal and state codes and standards, the California Solar Initiative Program, future customer adoption of distributed generation, future electric vehicle use, and other electrification load growth. ~~Therefore,~~ In addition, increased consideration of CCA by municipalities may lead to more notifications of CCA formation, which could lead to a longer RPS position for SCE. SCE expects its bundled retail sales forecast to change over time as SCE incorporates the best available information on the various drivers into its forecast. SCE's overall bundled retail sales forecast ~~may go up or down~~and resulting forecast RPS RNS will change depending on the net impact of all of these factors. It is not possible for SCE to predict the future changes to its bundled retail sales forecast ~~without completing the forecast process~~ due to the complex nature of the modeling efforts involved. Accordingly, the bundled

retail sales forecast that SCE uses at any given point in time is SCE's best prediction of bundled retail sales. As the bundled retail sales forecast goes up or down, it will increase or decrease SCE's projected RNS accordingly.

3. Do you expect curtailment of RPS projects to impact your projected RPS deliveries and subsequent RNS?

~~Curtailment is factored into SCE's forecasted RPS-eligible deliveries and subsequent RNS in two ways. For operating QF wind projects, curtailed amounts are reflected in historical deliveries, which are then averaged over the prior three years to develop a generation forecast for each resource that includes past curtailment impacts as a proxy for expected future curtailments. Such curtailments are typically attributable to line and equipment outages.~~ SCE currently forecasts a very small but increasing level of curtailment in solar between 2016 and 2020. Wind is forecasted to have little to no curtailment during this time period. SCE currently uses its forecasted curtailment in 2020 as its forecast for future years. Some details around how SCE makes its curtailment forecast are included below.

For projects in development in the Tehachapi Wind Resource Area ("TWRA"), SCE includes an estimate of curtailed generation based on analysis submitted in SCE's testimony regarding the Tehachapi Renewable Transmission Project ("TRTP") in its generation forecasts for projects in that location.~~47~~44 While potentially conservative, this analysis takes into account expected new interconnections in the TWRA, hourly generation profiles for wind and solar, and expected increases in transmission capacity as TRTP construction progresses. The amount of generation actually curtailed will be a function of real-time load, generation bids for dispatch,

~~47~~44 *See* Southern California Edison Company's Testimony in Response to the Assigned Commissioner's Ruling on the Tehachapi Renewable Transmission Project (TRTP), Application 07-06-031 (January 10, 2012); Southern California Edison Company's Supplemental Testimony in Response to the Assigned Commissioner's Ruling on the Tehachapi Renewable Transmission Project (TRTP), Application 07-06-031 (February 1, 2012).

actual generation output that differs from cleared bids for dispatch, and the amount of transmission capacity available.

Additionally, to the extent that other projects have been curtailed, or in the event SCE revises its curtailment estimates for resources in Tehachapi or elsewhere in California, those curtailment estimates may be incorporated into forecasts of generation in the future.

4. Are there any significant changes to the success rate of individual RPS projects that impact the RNS?

SCE reviews the status of contracted projects that are not yet online every quarter to assess the likelihood that each project will be successfully constructed and deliver energy. For the larger contracted projects that terminated in the last year, SCE ~~has~~had gradually dropped their likelihood of success over time such that when the projects eventually terminated, there was not a significant impact to SCE's forecast RNS. Overall, SCE has seen a number of large, near-term projects continue to make strides towards completion, resulting in a collectively higher anticipated success rate for these large, near-term projects than ~~in 2014.~~ was allocated to similar projects in 2015. As mentioned in Section IV.E above, the requirement of a Phase II Interconnection Study or better along with an application deemed complete with the appropriate environmental review agency have both contributed to a higher project success rate.

5. As projects in development move towards their commercial operation date, are there any changes to the expected RPS deliveries? If so, how do these changes impact the RNS?

As projects move closer to their commercial operation dates, there may be a number of reasons to change the expected RPS-eligible deliveries, including schedule changes from phased projects, commercial operation date changes, and availability of updated forecasted production information. These factors may either increase or decrease the RNS.

6. What is the appropriate amount of RECs above the procurement quantity requirement ("PQR") to maintain? Please provide a quantitative justification and elaborate on the need for maintaining banked RECs above the PQR.

While SCE intends to maintain a bank, determining the appropriate level of RECs above the PQR is dependent on a number of factors: the forecast level and uncertainty of bundled retail sales, fuel source mix in the renewables portfolio, performance of existing resources, project success rates, delay or acceleration of online dates, performance of new facilities once they are operational, the level of the existing portfolio that is re-contracted, and curtailment, among other factors. Annual variability of these factors can either increase or decrease the bank from year-to-year.

SCE does not target a minimum amount or range of RECs above the PQR for banking. Instead, SCE includes the expected success rate for projects in development and incorporates the above risk factors in its forecast, which creates an adequate margin of procurement.

7. What are your strategies for short-term management (10 years forward) and long-term management (10-20 years forward) of RECs above the PQR? Please discuss any plans to use RECs above the PQR for future RPS compliance and/or to sell RECs above the PQR.

When sufficiently long during short-term periods, SCE has used sales of renewable energy products, project deferrals, and solicitation deferrals in order to adjust its renewable procurement back in line with its forecasted RNS. If SCE forecasted short-term shortfalls, SCE would satisfy the need through additional procurement. For example, SCE could re-contract with existing projects, initiate an RPS solicitation, procure through pre-approved procurement programs, or make short-term purchases with Commission approval. Additionally, SCE diligently manages contracts to ensure all contractual obligations are met. SCE uses these activities for renewables portfolio optimization.

Specifically regarding the sale of RECs, when SCE has a long position in the near term, SCE evaluates whether a sale of renewable energy products is appropriate. This evaluation includes a calculation of SCE's renewable procurement position and RPS bank ~~with~~under a set of adverse assumptions. These assumptions include, but are not limited to, lower performance of existing resources than expected, lower risk-adjusted project success rates for contracted generation that is not yet online, and higher levels of curtailment than expected. SCE assesses its renewable procurement position with such adverse assumptions to ensure that, even in ~~the worst~~an adverse case scenario, SCE would still expect to meet its RPS targets after making the sale. It is not SCE's ~~practice~~intent to purchase renewable energy products solely for the purpose of selling them at a later date.

~~Moreover, when SCE considers whether to engage in sales of renewable energy products, SCE compares the NMV for the sales transaction against the NMV of proposals submitted to SCE in recent solicitations and other offers. If the NMVs for long-term renewable procurement are higher than the NMV for the sales transaction, it would be more cost effective for SCE to maintain its existing RPS bank for future compliance periods. Conversely, if the NMVs from recent solicitations are lower than the NMV for the sales transaction, SCE has an opportunity to optimize its renewables portfolio and realize value for its customer by selling renewable energy products.~~

At this time, SCE considers holding an excessive amount of bank in the long-term to be an inefficient use of resources. Rather, SCE generally allocates any near-term forecasted RECs above the PQR to years of forecasted shortfall. Additionally, as described in its response to question 6 above, SCE does not target a minimum amount or range of RECs above the PQR for banking. SCE takes into account project specific success rates to determine an adequate margin of procurement.

8. **Provide Voluntary Margin of Over-procurement ("VMOP") on both a short-term (10 years forward) and long-term (10-20 years forward) basis. This should include a discussion of all risk factors and quantitative justification for the amount of VMOP.**

SCE currently does not use a VMOP methodology on either a short-term or long-term basis. While there are different risks that have different impacts in the short and long-term, SCE believes it appropriately accounts for these risk factors in its forecasted RNS as described in prior sections.

9. **Please address the cost-effectiveness of different methods for meeting any projected VMOP procurement need, including application of forecast RECs above the PQR.**

SCE procures what it believes is needed to meet its RPS targets, allocating any near-term forecasted RECs above the PQR to years of forecasted shortfall. SCE's forecasted need is far enough in the future that SCE believes it can fill that need through additional procurement on a ratable basis. SCE believes it appropriately accounts for risk through the risk factors identified in its response to question 6 above, and currently does not utilize a VMOP.

In the event that SCE implements a VMOP methodology in the future, SCE would use the same methods to procure its projected VMOP procurement need as it uses to procure towards its RPS targets, including procurement of ~~Category 1, Category 2, and Category 3 products. The relative cost-effectiveness of these products depends on market prices for the different portfolio content categories at the time of procurement, expected future prices, and the constraints on the quantities of each product that can be procured. In order to obtain additional data on the cost-effectiveness of these products, SCE is soliciting long-term Category 2 and Category 3 unbundled REC products in its 2015 RPS solicitation in addition to long-term Category 1 products. SCE may also conduct an RFI, another solicitation, or bilateral negotiations for short-term Category 1, Category 2, or Category 3 unbundled REC products to realize potential cost~~

~~savings for customers and obtain additional information on the market for short-term products.~~Category 1 products.

10. Are there cost-effective opportunities to use banked RECs above the PQR for future RPS compliance in lieu of additional RPS procurement to meet the RNS?

There are a few alternatives for the potential use of banked RECs above the PQR, including applying them in the future compliance periods, engaging in sales for the amount of bank, and a combination of sales of Category 1 products and procurement of other products. As noted above in response to question 7, SCE does not hold an excessive amount of bank for the sole purpose of selling it later. SCE generally allocates any near-term forecasted RECs above the PQR to years of forecasted shortfall. SCE conducts various portfolio optimization strategies also described in its response to question 7 to manage its renewables portfolio.

~~In particular, SCE compares the long-term procurement cost of RECs, measured by the NMV, to market prices, as well as cost impacts of other portfolio optimization activities. The cost effectiveness of these opportunities must be determined at the time of procurement and/or sales, as market prices and SCE's portfolio change over time. In order to obtain additional data on the cost-effectiveness of all products, SCE is soliciting long-term Category 2 and Category 3 unbundled REC products in its 2015 RPS solicitation in addition to long-term Category 1 products. SCE may also conduct an RFI, another solicitation, or bilateral negotiations for short-term Category 1, Category 2, or Category 3 unbundled REC products to realize potential cost savings for customers and obtain additional information on the market for short-term products.~~

11. How does your current RNS fit within the regulatory limitations for portfolio content categories? Are there opportunities to optimize your portfolio by procuring RECs across different portfolio content categories?

All of the procurement in SCE's current renewables portfolio is from either contracts executed prior to June 1, 2010 or contracts for Category 1 products. Accordingly, SCE's procurement fits within the minimum target for Category 1 products and the maximum target for Category 3 products established by SB 2 (1x) and D.11-12-~~052.~~052, as well as the targets established in SB 350.

SCE does see opportunities to optimize its portfolio through procurement across the three portfolio content categories. ~~SCE intends to~~However, given SCE's current position of no RPS need in the near term, SCE will only solicit ~~long-term~~ Category ~~1, Category 2, and Category 3 unbundled REC~~1 products ~~in its 2015 RPS solicitation. SCE may also conduct an RFI, another solicitation, or bilateral negotiations for short-term Category 1, Category 2, or Category 3 unbundled REC products to realize potential cost savings for customers and obtain additional information on the market for short-term products~~if it conducts a 2016 RPS solicitation. Category 1 products will not only help ensure that SCE meets its RPS goals, but also help SCE satisfy its need for energy to serve its customers in a cost effective manner. Additionally, through soliciting near term REC sales, SCE may find opportunities to create value for its customers. SCE believes that by providing flexibility in its procurement strategy, SCE can minimize costs to its customers. ~~In addition, as discussed in Section II, eliminating the restriction on banking short-term products would increase SCE's ability to procure additional low-cost products for its customers.~~

VII.~~VIII.~~

MINIMUM MARGIN OF PROCUREMENT

SCE's renewable procurement efforts will be guided by its forecast of its renewable procurement needs, as described in Section ~~III~~II.B and provided in Appendices C.1 through C.4. In its forecast of its renewable procurement position and need, SCE currently accounts for the risks

of project failure and delay associated with contracted projects that are not yet online. To this end, SCE uses individual project-specific, risk-adjusted success rates for large, near-term projects and a flat ~~50~~60% success rate for the remaining projects, which is based on these projects' overall weighted average success rate. This probabilistic risk adjustment methodology for discounting expected energy deliveries from projects under development is modeled to represent project development success rates as well as any contingency that would make meeting the State's RPS goals less likely (e.g., delays due to transmission, curtailment, material shortages, load growth beyond that which is forecasted, or less than expected output from resources). Additionally, this methodology provides an appropriate minimum margin of procurement "necessary to comply with the renewables portfolio standard to mitigate the risk that renewable projects planned or under contract are delayed or cancelled."[~~48~~45] SCE will reassess its position on a periodic basis and, as such, expects that success rates may need to be modified in the future to reflect changes to SCE's portfolio.

The Commission should rely on retail sellers to calculate their minimum margins of procurement and should not attempt to impose a one-size-fits-all approach. As many of the projects in SCE's portfolio become operational, SCE will face different risks, including integration of these resources. The risks associated with project failure will be replaced by less significant risks of projects generating below full capacity. Similarly, SCE expects that the portfolio risk picture is not the same for each retail seller. For example, risks may vary depending on whether a portfolio contains a high proportion of contracts that are online (as discussed above) or depending on the various technologies being used (e.g., geothermal technology, which is a baseload resource, versus wind or solar technologies, which are more intermittent as described in Section ~~V~~IV.B). For these reasons, each retail seller should continue to have the authority to revise its approach to calculating the minimum margin of procurement through the RPS

[~~48~~45] CAL. PUB. UTIL. CODE § 399.13(a)(4)(D).

procurement planning process and each retail seller should have the flexibility to calculate this margin based on its unique portfolio make-up and procurement needs.

VIII.~~IX.~~

BID SOLICITATION PROTOCOL, INCLUDING LCBF METHODOLOGIES

A. Bid Solicitation Protocol

~~SCE includes its~~If SCE launches a 2016 RPS solicitation, SCE will use the proposed ~~2015~~2016 Procurement Protocol included here as Appendix F.1. The Procurement Protocol includes, among other things:

- SCE's requirements for initial delivery dates and preferred contract term lengths;
- Deliverability characteristics and locational preferences;
- SCE's ~~requirements~~preference for LCR and PRP projects;
- Encouragement for Women-Owned, Minority-Owned, Disabled Veteran-Owned, Lesbian-Owned, Gay-Owned, Bisexual-Owned, and/or Transgender-Owned Business Enterprises ("Diverse Business Enterprises") to participate in SCE's RPS solicitation and information on how sellers can help SCE to achieve General Order ("GO") 156 goals;
- Requirements for each proposal submission;
- A description of the type of products SCE is soliciting;
- A schedule of key dates related to the ~~2015~~2016 RPS solicitation; and
- SCE's ~~2015~~2016 *Pro Forma* Renewable Power Purchase Agreement ("*Pro Forma*"), attached as Appendix G.1; and
- ~~SCE's 2015~~2016 *Pro Forma* Master Renewable Energy Credit Purchase Agreement ("2016 REC ~~*Pro Forma*"), attached as Appendix H; and~~Purchase Agreement"), which will be supplied with supplementary materials later.

A discussion of the important changes in the proposed ~~2015~~2016 solicitation documents from SCE's ~~2014~~2015 solicitation documents is included in Section XV.

B. LCBF Methodology

In its LCBF evaluation process, SCE performs a quantitative assessment of each proposal and subsequently ranks them based on each proposal's benefit and cost relationship. The result of the quantitative analysis is a rank order of all complete and conforming proposals' net levelized cost that help define the preliminary shortlist. Following the quantitative analysis, SCE will conduct an assessment of the top proposals' qualitative attributes. These qualitative attributes, including factors such as local reliability, resource diversity, and nominal contract payments, are considered to either eliminate or add projects to the final shortlist based on qualitative attributes, or to determine tie-breakers, if any. Once a project is added to the shortlist, SCE may enter into a PPA with the project. By taking many quantitative and qualitative factors into consideration, SCE ensures that it will select projects best suited for its portfolio in order to meet customer needs and attain the State's RPS goals. Appendix ~~I~~H.1 (the "LCBF Methodology") describes this process, including capacity valuation and the renewable integration cost adder, among other factors.

In accordance with ~~D.15-12-025,[49] SCE has updated its LCBF Methodology to include a description of how there is no double counting between the renewable integration cost adder and other NMV components in SCE's LCBF methodology.~~ the ACR, SCE is also considering as qualitative factors in its LCBF valuation, the impact of a project on: (1) employment or Workforce Development; and (2) disadvantaged communities which are identified as Environmental Justice communities through California's Environmental Protection Agency's CalEnviroScreen 2.0.

~~[49] *See* D.15-12-025 at 102, Ordering Paragraph 7.~~

IX.~~X.~~

CONSIDERATION OF PRICE ADJUSTMENT MECHANISMS

As in the past three RPS solicitations, SCE does not plan to solicit price structures based on indices in its ~~2015~~2016 RPS solicitation. Sellers can ~~still~~, however, bid escalation factors in their prices. ~~Over the years, fewer and fewer proposals are based on prices tied to an index. In the more than 600 different proposals that SCE has received over the last two RPS solicitations, only one seller offered pricing tied to an index or other adjustment mechanism (other than simply an escalation/de-escalation factor).~~

Proposals with adjustable pricing based on indices were more common when the renewable industry was starting out. Uncertainties over relatively new technologies made it reasonable to tie pricing to certain commodity indices, inflation rates, or other indices that made sense given the technology. However, the industry is more sophisticated now, supply chains are becoming more stable, and price adjustment mechanisms based on indices are ~~simply~~ not needed. Sellers and SCE want price certainty and ~~do~~SCE does not want to be subjected to extraordinary high (or unsustainably low) pricing due to fluctuations in a commodity or other indices. ~~The~~Additionally, the ability to bid price adjustments based on indices increases complexity for sellers in the proposal process and for SCE in the evaluation process. ~~By eliminating~~Developers are not requesting price adjustment mechanisms ~~based on indices for the 2015 RPS solicitation, SCE is simply removing options that are no longer utilized in the market.~~ and the contract price risk uncertainty associated with them does not warrant their consideration.

X.~~XI.~~

ECONOMIC CURTAILMENT, FREQUENCY, COSTS AND FORECASTING

Although SCE has observed very few instances of negative pricing in the day-ahead market,[~~50~~46] negative prices have been observed on a more regular basis in the real-time market. SCE identifies several factors contributing to increases in instances of negative prices. ~~Systemic over~~Over-generation typically occurs in off-peak hours when baseload and must-take renewable generation is high and demand is low, which can cause negative market price hours ~~at trading hubs~~. On-peak negative prices tend to be localized, transient, and related to congestion caused by a particular transmission bottleneck.

It is generally difficult to forecast negative prices. SCE continues to manage potential instances of negative pricing, and the associated impact to SCE customers, through several different strategies. As a general practice, SCE schedules variable energy resources, such as solar and wind facilities, into the day-ahead market whenever possible. Because resources that are awarded day-ahead schedules are only exposed to negative prices in real-time for deliveries in excess of their day-ahead awards, this practice helps to limit customer exposure to negative prices. This practice is consistent with least-cost dispatch principles, which govern SCE's approach to marketing its entire portfolio of contracted and utility-owned resources.

Additionally, SCE plans to economically bid resources with economic curtailment rights into the day-ahead and real-time markets. Resources with these curtailment rights will then be curtailed as needed based on CAISO's economic dispatch. In some SCE PPAs, there is a pre-defined amount of pre-paid energy per year that may be economically curtailed, subject to some restrictions, without requiring SCE to pay for the energy that could have been delivered but for the curtailment instruction. As noted above, this amount is commonly referred to as a "curtailment cap." Once the curtailment cap is reached, SCE must pay the contract price for

[~~50~~46] ~ 0.05% of hours in sampled nodes in the day-ahead market – the vast majority of which occur at generally congested interties such as ~~PALO VERDE~~Palo Verde.

energy that could have been delivered but for the curtailment instruction. In other SCE PPAs, SCE has the right to curtail based on economic factors, but must always pay the contract price for energy that could have been delivered but for the curtailment instruction. These types of curtailment rights are commonly referred to as "take-or-pay." In instances where SCE has either exceeded the curtailment cap or only has "take-or-pay" economic curtailment rights to begin with, if SCE were not to curtail deliveries in excess of any schedules awarded at positive prices, customers would pay the contract price for that excess delivered energy *and* incur the costs associated with negative pricing in such intervals. SCE's economic bids will therefore serve to further limit customer exposure to negative prices both day-ahead and in real-time, even if SCE ultimately pays the contract price for curtailed energy.

~~As explained in Section III.F.1.a, in the 2014~~

If SCE conducts a 2016 RPS solicitation, ~~SCE required sellers to submit proposals both with and without a curtailment cap.~~ SCE will not require sellers to bid the pre-paid economic curtailment option with the curtailment cap ~~in the 2015 RPS solicitation~~. SCE will retain the right to curtail at its discretion, but will pay for curtailments directly resulting from SCE marketing decisions. As in prior years, SCE will not pay for curtailments in response to an emergency, or due to CAISO or transmission provider instructions.

XI.

CALIFORNIA TREE MORTALITY EMERGENCY PROCLAMATION

The ACR requested that SCE address three fundamental issues regarding the Proclamation. SCE's discussion of each issue is below:

1. Provide a table listing existing RPS-eligible biomass contracts. The table should include the contracts' *expiration date, contract capacity, facility name, location, and contract price.*

SCE currently has no existing RPS-eligible biomass contracts.

2. Describe the benefits that biomass contracts provide to your renewable portfolio.

The primary benefit that biomass contracts provide to SCE's renewable portfolio is that they help deliver RPS energy. Outside of the RPS benefit, biomass contracts do not offer other unique benefits because biomass facilities are not typically dispatchable nor located in load centers. In fact, biomass facilities in remote mountainous areas could create a problem if the plant output exceeds the system capacity of small networks.

As SCE stated in its Petition for Modification of Decision 10-12-048, "the purpose of the Proclamation is to protect the general public from life safety risks associated with wildfires, to prevent watershed-wide environmental degradation, and to facilitate the removal of dead trees that threaten power lines and other critical infrastructure."[47] Accordingly, these biomass facilities do not offer a unique benefit to SCE's customers but instead are being considered as one method to address a state-wide emergency associated with tree mortality that could lead to wildfires, environmental degradation, and impacted transportation infrastructure that could affect all California residents to some degree and could affect mountainous communities directly. In addition, wildfires and falling trees near electric transmission lines[48] could affect electric system reliability that would also affect all electric customers in California.

Biomass facilities provide energy, capacity, and RPS credits but provide no other benefits to IOU electric customers that would justify paying a premium for this energy. However, as identified above, biomass facilities offer benefits to all citizens of California. As a result, any solution to address removal and disposal of HHZ material should fairly distribute above-market costs to all California citizens. Allocating above-market costs solely to IOU bundled electric customers, including SCE's bundled service customers, is not an equitable cost allocation.

3. *When considering authorizing of additional Proclamation-related procurement, what alternatives (e.g. contract extensions) to additional RAM auctions should be*

[47] Rulemaking 08-08-009, Petition for Modification of Decision 10-12-048 filed jointly by Pacific Gas and Electric Company and Southern California Edison Company, April 19, 2016, at p. 5.

[48] SCE already maintains a vegetation management program that seeks to remove trees that threaten the electric transmission and distribution lines and also that could increase the risk of fire caused by contact with electric system equipment.

considered? Describe the advantages and disadvantages for each alternative in relation to addressing the Proclamation.

The most significant issues related to addressing the Proclamation is to assure that the above market costs associated with addressing the Proclamation are shared fairly among all citizens of California. In that regard, SCE offers two concepts to allow California to fairly address the Proclamation.

First, the costs and benefits of any BioRAM solicitation should be shared ratably among all electric service providers including municipal utilities, investor owned utilities, and other LSEs. Equitably sharing all costs and benefits among all California electric consumers would fairly allocate those costs and benefits that the IOUs are being required to provide as a benefit to all of California.[49] The advantage would be that costs and benefits would be spread to all electric consumers in California which could increase the pool of customers paying for these above-market costs. The disadvantage is that this would expand the customer base to municipal utilities which is outside of the scope of the Proclamation and outside of the jurisdiction of the Commission. This proposal could not be adopted without further action by the Governor and/or the Legislature.

A second, and possibly more expedient solution would be for various federal, state, and local governmental agencies to fund the cost of disposing of this HHZ material. If public agencies were responsible for the cost of acquiring and disposing of HHZ material, then there may be no above-market electricity costs associated with their disposal. Moreover, if the most efficient disposal method is not through burning HHZ fuel, that method could be chosen. One method that may be available would be sale of the wood to third parties interested in using it. If public agencies decided that burning the HHZ material is the best option, the cost would be paid through public funds. The benefit of this proposal to the Proclamation is that it would allow public agencies to have complete control of the process to identify HHZ materials to be harvested and the quantity of

[49] To completely share costs, the Commission should consider a minimum fixed customer charge that would also recover costs from net energy metering customers.

HHZ material that is harvested. The disadvantage related to the Proclamation is that this approach relies on public funds that may be difficult to acquire.

Another consideration for the Tree Mortality issue is that the Commission should carefully consider the disconnect between the amount of HHZ material that is available to be harvested versus the amount of HHZ material that can be reliably harvested in order to support continuous or near continuous utilization of biomass facilities. The Commission should consider solicitation of seasonal BioRAM contracts that would be in effect only during the months that reliable levels of HHZ material can be available to the biomass facility. HHZ material availability is influenced by several factors including snowpack, forest fires, distance from the HHZ material to the biomass facility, and so on. Future BioRAM solicitations should consider these seasonal factors and not attempt to force a baseload annual contract to a fuel source that is only available during certain seasons. Considering the seasonal availability of HHZ material will significantly impact how the Commission addresses the Proclamation. Finally, contracts to meet the needs of a Proclamation to address HHZ material removal should not pay above-market costs once the emergency described in the Proclamation has ended. As a result, special consideration should be made to adopt short-term contracts, adopt termination rights for buyer or seller, or adopt market-based contract pricing in the event that HHZ material is not available or if the tree mortality issue becomes a non-emergency.

XII.

EXPIRING CONTRACTS

For SCE's RPS-eligible contracts expiring in the next ten years, Appendix E includes the name of the facility, technology, contract expiration date, nameplate capacity, expected annual generation, location, contract type, and portfolio content category classification. SCE used the template for reporting on RECs from expiring contracts as provided in the RNS Ruling.

XIII.

COST QUANTIFICATION

The spreadsheet attached as Appendix D includes actual expenditures per year for RPS-eligible generation for every year from 2003 through ~~2014,~~2015, as well as actual RPS-eligible generation for every year from 2003 through ~~2014.~~2015. Appendix D also includes a forecast of future expenditures SCE may incur every year from ~~2015~~2016 through 2030, as well as a forecast of expected generation for every year from ~~2015~~2016 through 2030.[~~51~~]

XIV.

IMPERIAL VALLEY

In ~~addition to the ORNI 18 project, which has been online and operating since October 2009, SCE executed PPAs with two projects (Mount Signal) located in the Imperial Irrigation District in the 2013 RPS solicitation. Both of those solar projects have executed interconnection agreements and are fully permitted.~~ [redacted]

[redacted] SCE's 2015 RPS solicitation, SCE received 279 proposals. [redacted]

~~In SCE's 2014 RPS solicitation, SCE received 382 unique complete and conforming proposals.~~ [redacted]

~~[51] For all forecast years, SCE has assumed a 100% success rate for projects that are not yet online. The 2014 RPS solicitation contracts and contracts executed after the filing of SCE's original 2015 RPS Plan on August 4, 2015 are not included.~~

[redacted] [52]

XV.

IMPORTANT CHANGES FROM 20142015 RPS PLAN

~~SCE's 2015 RPS Plan includes important changes to: (1) SCE's 2015~~SCE has made significant changes to the Written Plan to recognize that SCE, at present, has no need for eligible renewable resources. As a result, SCE has not yet decided whether to go forward with a 2016 RPS solicitation. SCE will inform the Commission via a Tier 1 Advice Letter by March 1, 2017 whether it will go forward with a 2016 RPS solicitation and will provide a proposed schedule for that solicitation at that time. Any 2016 RPS solicitation held by SCE may include a request for offers to purchase from SCE RECs of 2016-2020 vintage and will include one of the two required Community Renewables solicitations. SCE's Written Plan also includes new materials to comply with the ACR concerning: (1) the Proclamation regarding Tree Mortality, (2) Workforce Development, and (3) Disadvantaged Communities.

SCE's 2016 RPS Plan includes changes to: (1) SCE's 2016 Procurement Protocol; (2) SCE's ~~2015~~2016 *Pro Forma*; and (3) SCE's LCBF Methodology. Those changes are summarized below. SCE has included redlines of its ~~2015~~2016 Procurement Protocol, ~~2015~~2016 *Pro Forma*, and LCBF Methodology against the versions of those documents included in SCE's ~~original~~ 2015 RPS Plan ~~filed on August 4, 2015~~ as Appendices F.2, G.2, and I.2, respectively. SCE has ~~also included a redline of its 2015 REC *Pro Forma* against the final 2014 version of that document as~~

~~[52] Resolution E-4726, issued on September 18, 2015, directed SCE to re-evaluate proposals from its 2014 RPS solicitation for projects that were to be interconnected to the Imperial Irrigation District's electrical system considering the differences between the CAISO Tariff and Imperial Irrigation District Open Access Transmission Tariff.~~ [redacted]

~~Appendix H.2.[53] The changes to the 2015 REC *Pro Forma* were minor.~~ made relatively few changes to these documents from the 2015 documents. The most significant changes are summarized below.

~~SCE has changed its Written Plan in accordance with the ACR, including following the general format set forth in the ACR and adding new sections on consideration of a higher RPS goal and economic curtailment. SCE has also added new sections on the Standard Contract Option using the streamlined RAM procurement tool, the GTSR program, short-term products, and energy storage procurement. Furthermore, since the filing of SCE's original 2015 RPS Plan on August 4, 2015, SCE has made additional changes to its 2015 Written Plan to conform to D.15-12-025. SCE has included a redline of its 2015 Written Plan against the version of its 2015 Written Plan included in SCE's original 2015 RPS Plan filed on August 4, 2015 as Appendix A.~~

A. Important Changes in ~~2015~~2016 Procurement Protocol

1. Considering Proposals only for ~~Long-term~~ Category ~~2~~1 Products

~~In the 2014 RPS solicitation, SCE solicited long-term Category 1 and Category 3 unbundled REC products. As provided in SCE's 2015 Procurement Protocol, SCE will also consider proposals for long-term Category 2 products from both new and existing generation facilities in the 2015 RPS solicitation.~~

~~SCE intends to include long-term Category 2 products in its 2015 solicitation to provide additional flexibility and contracting opportunities for its customers. Any contracts for Category 2~~

~~[53] SCE has not modified its 2015 REC *Pro Forma* from the version of that document filed with SCE's final 2014 RPS Procurement Plan on December 8, 2014.~~

products ultimately executed by SCE will be within the limits on procurement of Category 2 products.[54]

2. **Elimination of Pre-Paid Economic Curtailment Bidding**

As discussed in Section III.F.1.a, SCE will not require sellers to bid the pre-paid economic curtailment option with the curtailment cap in the 2015 RPS solicitation. SCE will retain the right to curtail at its discretion under the 2015 *Pro Forma*, but will pay for economic curtailments as detailed in Section XV.B.1. As in prior years, SCE will not pay for curtailments in response to emergencies, or due to CAISO or transmission provider instructions.

3. **Elimination of Price Adjustment Mechanisms Based on Indices**

For the 2015 RPS solicitation, SCE will eliminate sellers' option to bid price adjustment mechanisms based on indices as explained in Section X.

4. **Targeting Specific Delivery Periods**

In past RPS solicitations, SCE did not limit the products that sellers could bid, which resulted in a large number of proposals. For example, in SCE's 2011 RPS solicitation, SCE received over 1,400 proposals. This volume of proposals required substantial time and effort on behalf of SCE and sellers, but did not lead to the execution of any contracts. Based on this experience, SCE used a more targeted solicitation process in 2013 that focused more specifically on SCE's needs. SCE limited the 2013 RPS solicitation to Category 1 products and projects with commercial operation dates of January 1, 2016 or later. With those limitations in place, SCE had a robust proposal pool of over 350 proposals from which to select. In 2014, SCE limited the solicitation to long-term Category 1 and Category 3 unbundled REC products. Additionally, all projects were required to have commercial operation dates of January 1, 2016 or later, have a

[54] *See* Cal. Pub. Util. Code § 399.16(c).

~~Phase II Interconnection Study (or an equivalent or more advanced interconnection status or exemption), and have an "application deemed complete" (or equivalent) status within the applicable land use entitlement process. With those requirements in place, SCE had a robust proposal pool of 382 complete and conforming proposals.~~

In the 2015 RPS solicitation, SCE ~~intends to provide sellers with further direction on the products and the timeframes where SCE has a need. SCE wants to focus the efforts of both SCE and sellers on proposals that are likely to be most valuable to SCE's customers, thus simplifying the solicitation and evaluation process for all parties. To this end, SCE intends to solicit offers with delivery terms commencing on or before December 1, 2020. This time frame will allow projects to satisfy SCE's long-term renewable procurement need. Additionally, sellers must propose commercial operation dates that start on the first day of the month to simplify the administrative and settlement processes for these contracts.~~solicited long-term Category 1, Category 2, and Category 3 products. As provided in SCE's 2016 Procurement Protocol, SCE will only consider proposals for Category 1 products from both new and existing generation facilities if it launches a 2016 RPS solicitation.

SCE has made this change given its relatively long RPS position in the near term. SCE believes that projects providing Category 1 product are best suited to deliver energy in the long-term and be flexible on start dates and term length.

2 Commercial On-Line Date Beginning on January 1, 2021 or Later

If SCE conducts a 2016 RPS solicitation, SCE wants to focus the efforts of both SCE and sellers on proposals that are likely to be most valuable to customers. To this end, SCE intends to solicit Category 1 products with delivery terms commencing on or after January 1, 2021, except in the Western LA Basin and Goleta area. SCE has no need for near-term eligible renewable resources at this time. Therefore, if SCE conducts a 2016 RPS solicitation, SCE will

require sellers to offer projects with a start date of January 1, 2021 or later, unless they are located in the Western LA Basin or Goleta area where there is currently a specific local reliability need. The proposed 2021 start date helps to align deliveries with SCE's need, while establishing an online date that is not so far into the future as to make it unrealistic for sellers to bid projects that are near "shovel ready."

3. Offering 10 Year Term Lengths or Less

As discussed above, if SCE launches a 2016 RPS solicitation, SCE will allow sellers to offer terms of any length. However, SCE will also require that sellers propose at least one offer with a term length of 10 years or less for each project. With the changing RPS rules that may result with the implementation of SB 350 along with the uncertainties around future load growth, distributed energy resources, departing load, electric vehicles and industry technology advances, it is prudent to solicit contracts with shorter term lengths.

4. Solicitation Schedule is To Be Determined

Typically, SCE's RPS Procurement Protocol includes a proposed schedule for the RPS solicitation. However, in 2016, SCE has not yet decided whether to move forward with a 2016 RPS solicitation. So, the proposed scheduled for the 2016 RPS solicitation, included in the 2016 RPS Procurement Protocol, at Section 3.01, includes only the events that may occur, if SCE decided to go forward with the solicitation, but shows the dates as "to be determined." If SCE decides to go forward with a 2016 RPS solicitation, it will inform the Commission of its plan via Tier 1 Advice Letter no later than March 1, 2017. That Advice Letter will attach a revised Section 3.01 to the 2016 RPS Procurement Protocol with dates filled in.

5. ~~Inclusion of Standard Contract Option~~REC Sales Will Be Part of this Solicitation

~~SCE's 2015 RPS solicitation will include a Standard Contract Option based on the streamlined RAM procurement tool authorized in D.14-11-042. This option is addressed in detail in Section XVII.~~

As discussed above, SCE plans to solicit offers for SCE to sell RECs of 2016-2020 vintage as part of any 2016 RPS solicitation that it may hold. The 2016 RPS Procurement Protocol, in Article 1, includes solicitation of proposals to sell RECs of 2016-2020 vintage which may be part of any 2016 RPS solicitation.

6. ~~Limiting Sellers to Eight Proposals Per Project~~Workforce Development

~~As explained in Section III.F.1.c, SCE will limit sellers to eight proposals per project in the 2015 RPS solicitation.~~

The ACR, at p. 14, stated that "the 2016 RPS Procurement Plans shall include a description of a proposed approach for assessing and differentiating the ability of different bids to contribute to employment growth." The 2016 RPS Procurement Protocol, at Section 3.2(g)(i), includes a requirement that each bid address its ability to contribute to employment growth. As discussed in Section XV.C.1 below and in Appendix H.1, SCE's LCBF methodology will assess this information as one of the qualitative factors considered for each bid.

7. **~~Elimination of Mutually Inclusive Proposals~~ Disadvantaged Communities**

~~In SCE's 2014 RPS solicitation, no mutually inclusive proposals were presented by sellers. In the 2013 RPS solicitation, there was only one mutually inclusive proposal. Mutually inclusive proposals present added complexity, both in terms of the complete and conforming process, as~~

well as trying to capture them properly in SCE's valuation tools. Thus, SCE will not entertain mutually inclusive offers going forward.

8. **Changes to Required Non-Disclosure Agreement Process for Sellers**

In the 2015 RPS solicitation, SCE will begin to transition RPS solicitation sellers to an evergreen Non-Disclosure Agreement ("NDA") process, which is currently used in other procurement solicitations (All-Source RFOs, LCR RFO, etc.). The evergreen NDA will be between SCE and seller companies who are offering projects into the solicitation; therefore, one NDA could cover multiple projects as well as multiple proposals. This will greatly streamline the solicitation process for both SCE and sellers.

In past years, SCE has required sellers to submit a short-term NDA that only applied to the current solicitation for every proposal and every project. This method produced an inefficient process for both parties. The introduction of an evergreen NDA will simplify administration of, and participation in, the 2015 RPS solicitation, and these NDAs will also be valid for future RPS solicitation proposals between the sellers and SCE.

9. **Elimination of Seller's Form of Proposal**

For its 2015 RPS solicitation, SCE is eliminating the Seller's Form of Proposal attachment. Instructions to sellers on proposal submittal and required attachments have now been migrated to, and thoroughly explained in, the 2015 Procurement Protocol.

10. **Elimination of Multiple Attestations and Replacement with Officer's Certificate**

In past RPS solicitations, SCE has required multiple attestations from sellers on a per-proposal basis. In the 2015 RPS solicitation, SCE plans to combine all of the required

attestations into one form that an officer of seller's company must sign. This refined document and process will simplify the solicitation process for both sellers and SCE.

11. **Elimination of Shortlist Deposit Requirement**

SCE has required that all projects selected for the shortlist post a shortlist deposit in the form of cash or letter of credit in past RPS solicitations. For the 2015 RPS solicitation, SCE will eliminate this requirement because SCE does not believe it has added value to the solicitation process. The original intent of the requirement was to financially obligate sellers to the solicitation process in the hopes that only sellers who were as committed as SCE to negotiating and executing a final PPA would post the deposit. However, because securing letters of credit and/or posting cash has become less of an obstacle for project sponsors as the market has matured, this exercise has been deemed superfluous. SCE believes requiring sellers to post development security at the time of PPA execution will add more value to the process as explained in Section XV.B.5.

12. **Supplier Diversity**

SCE continues to encourage Diverse Business Enterprises to participate in its RPS solicitation. Consistent with GO 156, D.15-06-007 recently expanded the definition of minorities to include Lesbian-Owned, Gay-Owned, Bisexual-Owned, and/or Transgender-Owned Business Enterprises.[55] SCE has incorporated these enterprises into its definition of Diverse Business Enterprises. SCE has also included, as an attachment to its 2015 Procurement Protocol, a sample list of potential products and services that may be available through Diverse Business Enterprise subcontractors.

[55] The decision also provided for a five year implementation plan, among other provisions.

The ACR, at p. 15, quoted from Public Utilities Code Section 399.13(a)(7) requiring the utilities to "give preference to renewable energy projects that provide environmental and economic benefits to communities afflicted with poverty or high unemployment, or that suffer from high emission levels of toxic air contaminants, criteria air pollutants, and greenhouse gases." The ACR then stated that "the 2016 RPS Procurement Plans shall include a description of their methodology for preferring projects that provide the benefits described in 399.13(a)(7)." The 2016 RPS Procurement Protocol, at Section 3.2(g)(i), includes a requirement that each bid address its impact, if any, on such disadvantaged communities, identified in the Environmental Justice communities through California's Environmental Protection Agency's CalEnviroScreen 2.0. As discussed in Section XV.C.2 below and in Appendix H.1, SCE's LCBF methodology will assess this information as one of the qualitative factors considered for each bid.

B. Important Changes in ~~2015 *Pro Forma*~~2016 *Pro Forma*

~~*1.* Pre-Paid Economic Curtailment: Sections 3.12(g) and 4.01(b)(iii)~~

~~As explained in Sections III.F.1.a and XV.A.2, SCE is eliminating the requirement that sellers bid the pre-paid economic curtailment option with the curtailment cap in the 2015 RPS solicitation. SCE is also eliminating the provisions regarding pre-paid curtailment hours and the curtailment cap in the 2015 *Pro Forma*.~~

The ~~2015 *Pro Forma* includes SCE's right to curtail a generating facility in response to an instruction from CAISO or the transmission provider, in order to respond to an emergency, or if SCE issues a Curtailment Order,[56] which may be given in SCE's sole discretion. Sellers will be paid the contract price for energy that could have been delivered but for a Curtailment Order. As~~

~~[56] Under the 2015 *Pro Forma*, "Curtailment Order" means an order from SCE to Seller to reduce or stop the delivery of electric energy from the Generating Facility to SCE for any reason except as set forth in Sections 3.12(g)(i)-(ii).~~

in the 2014 *Pro Forma*, sellers will not be compensated for curtailments due to CAISO or transmission provider instructions or to respond to emergencies. This language gives sellers sufficient certainty of future revenues, while also enabling SCE to respond to CAISO market signals to help alleviate congestion and mitigate customer exposure to negative prices.

2. **Elimination of Startup Period and Initial Synchronization Period: Section 4.01 and Exhibit E**

In the 2015 *Pro Forma*, SCE will eliminate the startup period and initial synchronization periods that are outlined in the PPA. The elimination of these provisions will simplify contract administration and project onboarding for future projects. This change will also provide for cost certainty for SCE customers.

SCE's past practice has been to value each project as proposed by the seller, with dates certain for the delivery term and a set quantity of energy at a forecasted capacity factor based on the generation profile furnished with the proposal package. All of these factors result in an NMV and estimated notional payments for each project, which are used to determine shortlisting and contract selection. However, prior RPS *pro forma* PPAs have allowed the seller to have a start-up period whereby SCE compensates the seller for energy deliveries prior to the delivery term. These deliveries are dictated by the seller per their schedule and SCE has no influence over the volumes delivered in this initial start-up period.

SCE proposes to eliminate the start-up period and provide sellers the opportunity to manage the plant testing, commissioning, and initial synchronization prior to the commercial operation date with SCE. Having the seller manage the start-up of the plant prior to the commercial operation date with SCE will allow the sellers to market the attributes of the facility, reduce the onboarding complexity of operations and settlements for SCE and the seller, and

eliminate the potential for any disputes related to SCE acting as the scheduling coordinator during these start-up periods.

The elimination of these provisions and the requirement that projects be bound by one online date at one contract capacity will also eliminate additional costs to customers that were not included in the valuation of the project and bring SCE's 2015 *Pro Forma* in line with other SCE *pro forma* PPAs (e.g. New Generation PPAs for gas-fired plants, Energy Storage PPAs, Combined Heat and Power ("CHP") PPAs, etc.).

3. **Financial Consolidation: Section 8.06**

SCE is also incorporating language into the 2015 *Pro Forma* that will obligate sellers to provide SCE with appropriate financial statements in order to include projects in its financial filings to the Securities and Exchange Commission in the event that SCE must consolidate any entity in which it has a controlling financial interest. Under GAAP,[57] a reporting entity (SCE) must consolidate in its financial statements any entity in which it has a controlling financial interest. At this time, SCE has not had an obligation to consolidate sellers of renewable resources under RPS contracts; however, the determination is made on the specific facts and circumstances of the seller's legal structure and the terms its contractual arrangements. Further, future changes in accounting rules and interpretations could also trigger financial consolidation by SCE. As a result, SCE required the language in all final versions of negotiated PPAs in the 2014 RPS solicitation and SCE is requiring these provisions in all SCE *pro forma* PPAs going forward.

[57] "GAAP" means Generally Accepted Accounting Practices. The common set of accounting principles, standards, and procedures that companies use to compile their financial statements. GAAP are a combination of authoritative standards (set by policy boards) and the commonly accepted ways of recording and reporting accounting information.

4. **No Return of Development Security for Failure to Obtain Permits After Six Month Extension to Commercial Operation Deadline for Reasonable Permitting Delays and Additional Optional Cure Period With Daily Delay Liquidated Damages: Sections 1.03(b), 3.06(c), and 5.03; Former Section 2.03(b)**

In the 2015 *Pro Forma*, SCE will be entitled to retain 100% of the seller's development security in the event a project is unable to obtain material permits for the project after a six month extension of the commercial operation deadline for reasonable permitting delays and an additional optional cure period of up to six months with daily delay liquidated damages.

In D.15-12-025, the Commission stated that SCE's 2015 *Pro Forma* "shall provide for day-for-day extensions of Commercial Operation Dates (COD) to account for reasonable permitting delays and force majeure events, a reasonable period to cure any delays in achieving COD, and a graduated draw-down of the development security during the cure period."[58]

In accordance with D.15-12-025, SCE has added a provision in Section 1.03(b) of the 2015 *Pro Forma* providing that if a seller has not obtained Permit Approval[59] on or before the date that is 90 days before the forecasted commercial operation date, the seller may obtain a six month extension of the commercial operation deadline, provided that such an extension shall not be given if the failure to obtain Permit Approval was as a result of seller's failure to take all commercially reasonable actions to apply for and meet all of its requirements and deadlines to obtain such Permit

[58] D.15-12-025 at Ordering Paragraph 7.

[59] "Permit Approval" means approval by the relevant regulatory agencies of any Permit and shall be deemed obtained upon the issuance of such Permit, and shall not be invalidated by the pendency of an appeal or other post-issuance challenge to the issuance of the Permit.

Approval.[60] This provision provides an extension of the commercial operation deadline to account for reasonable permitting delays in compliance with D.15-12-025.[61] SCE has included a flat six month extension rather than a day-for-day extension because this extension provides sellers with a reasonable extension of the commercial operation deadline to account for reasonable permitting delays while eliminating disputes over the number of days the extension should cover. This approach has already been approved by the Commission for SCE's RAM standard contract[62] and is reflected in the 2015 *Pro Forma* for Standard Contract Option projects.[63]

In addition to the six month extension, sellers already receive flexibility in terms of their commercial operation date. SCE's 2015 *Pro Forma* requires a negotiated "no later than date" (Section 1.03(a)) and a negotiated "no earlier than" date (Section 2.02(b)(i)) by which commercial operation must occur (subject to permitted extensions). This provides sellers a commercial operation "window" to commence operations. If necessary, sellers have the flexibility to utilize the extra time within the "window" to finalize construction of the facility in case of any permitting or other delays.

SCE's 2015 *Pro Forma* also provides an extension of the commercial operation deadline to account for force majeure events. Specifically, Section 5.03 of the 2015 *Pro Forma* provides that if the commercial operation date does not occur on or before the commercial operation deadline as the result of a force majeure event occurring before the commercial operation deadline, then the

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[60] As provided in Section 1.03(c) of the 2015 *Pro Forma*, this extended commercial operation deadline may be no later than a set date, which is negotiated between the parties and is typically one year after the forecasted commercial operation date.

[61] Because the seller now has a flat six month extension for reasonable permitting delays, SCE has eliminated former Section 2.03(b) of the 2015 *Pro Forma*, which provided either party could terminate the agreement if seller has not obtained Permit Approval of the Construction Permits by a set date with SCE entitled to retain 100% of the development security.

[62] *See* Section 1.04(c) of RAM 6 standard contract, SCE Advice 3195-E, Appendix B (approved on June 17, 2015).

commercial operation deadline will, subject to Sections 1.03 and 5.04 and seller's compliance with its obligations as the claiming party under Section 5.02, be extended on a day-for-day basis for the duration of the force majeure.

Moreover, SCE's 2015 *Pro Forma* satisfies D.15-12-025's requirement to provide a reasonable cure period for any delays in achieving commercial operation and a graduated draw-down of development security during the cure period. In particular, Section 3.06(c) of the 2015 *Pro Forma* provides that a seller may extend its commercial operation deadline for any reason by paying SCE daily delay liquidated damages in an amount equal to 1% of the development security per day for up to 180 days. Accordingly, in addition to the free six-month extension for reasonable permitting delays discussed above, a seller can extend its commercial operation deadline for any reason for up to an additional six months by paying daily delay liquidated damages.[64] This is a reasonable cure period for commercial operation delays.

SCE's daily delay liquidated damage provision is equivalent to the requirement in D.15-12-025 for a graduated draw-down of development security during the cure period, because it results in the same monetary outcome. While the seller is responsible for paying daily delay liquidated damages, which are not deducted from the development security, upon successfully achieving commercial operation and demonstrating the full contract capacity, the seller is entitled to receive a full return of the development security. The full return of the development security netted with the daily delay liquidated damage payments results in the same amount of money as a graduated draw-down of the development security.

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[63] *See* 2015 *Pro Forma* (attached as Appendix G.1) at Section 1.03(b).

[64] As provided in Section 1.03(c) of the 2015 *Pro Forma*, this extended commercial operation deadline may also be no later than a set date, which is negotiated between the parties and is typically one year after the forecasted commercial operation date.

~~SCE's approach to a graduated draw-down benefits sellers because most sellers post development security as a letter of credit, which if drawn, may have negative financial repercussions for the seller. SCE's policy is to draw on letters of credit only in cases where sellers fail to pay.~~

~~These changes remove the concept of a "free walk" related to permitting delays while evenly distributing the permitting risk between sellers and SCE's customers. In the past, sellers have faced zero financial repercussions for failing to successfully bring a project to completion if it was due to the failure to obtain the requisite permits and such failure was not due to any act or failure to act by seller. This provision effectively placed all of the permitting risk on SCE and its customers.~~

~~Because the seller is responsible for selecting a site location and moving a project successfully through the permitting process, the seller should have the obligation to provide protection in the form of development security to SCE's customers if the project does not attain commercial operation, even after an extension of the commercial operation deadline for reasonable permitting delays and a reasonable period to cure any delays in achieving commercial operation. The requirement for a Phase II Interconnection Study and an "application deemed complete" to participate in the solicitation means that projects proposed in the RPS solicitations have progressed significantly in terms of development. Accordingly, it is fair and reasonable to place a portion of the permitting risk on the seller.~~

~~SCE's Independent Evaluator ("IE") Merrimack Energy Group recommended an even more stringent version of this change to SCE's RPS *pro forma* PPA in their IE report to the Commission regarding the 2014 RPS solicitation PPAs. The IE report states, "It is far more typical in renewable energy solicitations of which Merrimack Energy is aware that Sellers who fail to~~

achieve commercial operation due to failure to receive permits take the financial risk in the PPA by forfeiting all or a portion of the security deposit as liquidated damages. This may help in reducing the 'contract failure' rate, by deterring developers with major project permitting risks from bidding or by requiring them to price the risk into their bids."[65]

5. Development Security Due at PPA Execution: Section 3.06

In the past, SCE's development security provisions required sellers to post the first half of their collateral within 30 calendar days of the contract effective date (i.e., PPA execution) and the second half within 30 calendar days after final Commission approval. The time between the effective date and the first posting allows for a significant period of time in which the seller may default under the PPA without consequence as the seller has not posted any collateral. Such events have occurred during other SCE renewable solicitations. These defaults could affect SCE's ability to comply with RPS targets and may impact SCE customers by requiring SCE to procure higher-priced renewable energy when these situations arise. Therefore, in the 2015 *Pro Forma*, SCE has moved the posting of development security to PPA execution.

Requiring full posting of development security at PPA execution will reduce risks for SCE's customers. Sellers must either wire cash or provide a letter of credit as development security when they transmit an executed PPA. SCE will not counter-sign until the collateral and partially executed PPA have both been received. This change will also provide greater certainty for SCE that a PPA will not be terminated immediately, avoiding situations where SCE proceeds to onboard the project and begin the process of seeking Commission approval only to have the PPA terminate because the seller does not post development security.

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[65] SCE Advice 3255-E, Appendix C at 48.

6. Shared Transformers and Low Side Metering Permitted with Customer Protections: Sections 3.01(d)(iv), 3.05, 3.08, 3.09, 3.11(c)(xxiv), 3.28, 4.02, 6.01(b), 6.02, 8.04, 10.02(d), 10.03(b)(viii), and 10.18, and Exhibit A

In accordance with D.15-12-025,[66] SCE modified the 2015 *Pro Forma* to permit generating facilities to utilize shared transformers and low-side metering. SCE also included customer protections specific to generating facilities utilizing shared transformers and low-side metering, including:

- Seller must install CAISO revenue-grade metering sufficient to satisfy both SCE and the CAISO that the metering arrangement is sufficiently accurate and can be used to properly allocate output to the correct generating facility. The CAISO and/or SCE may require CAISO revenue-grade meters on both the high-side and low-side of the transformer;
- Seller must become its own Account Holder, or designate a third party as the Account Holder, for the RECs generated by the generating facility;
- Seller must become its own Qualified Reporting Entity ("QRE"), or designate a third party as the QRE, who has independent oversight and would have visibility to all of the meters associated with generators sharing the transformer, regardless of whether those generators are under contract with SCE;
- Seller must transfer RECs on a regular basis to SCE;
- An event of default will be triggered should the CAISO rescind its exemption around shared transformers and low-side metering;

[66] *See* D.15-12-025 at 104-105.

- Seller shall provide indemnities that allow SCE to recover any penalties, sanctions or fines imposed by the CAISO, CEC, or WREGIS as a result of any inaccuracy of the shared metering scheme;
- Seller shall provide indemnities that allow SCE to recover payment for the product in the event that RECs are disallowed or the seller fails to transfer RECs to SCE on a timely basis;
- Seller shall comply with specific requirements around the transfer of RECs after the end of the term of the contract (as RECs are generated approximately three months following energy generation); and
- Seller shall agree that a change of the CAISO, Commission, WREGIS, or CEC policies towards shared metering and/or shared transformers shall not be considered a "change in law" or subject to the compliance expenditure cap in the 2015 *Pro Forma*.

These customer protections are based on SCE's experience with shared facilities and are intended to ensure that SCE is receiving accurate meter data and will receive the RECs paid for by SCE's customers. The customer protections are generic enough to cover a subset of facilities with shared transformers and low-side metering and should not result in barriers to entry for counterparties, as they have been accepted through amendments in specific past situations. The most significant departure from SCE's standard practice is the requirement for sellers with shared transformers and low-side metering to manage a WREGIS account and to facilitate the transfer of RECs to SCE on a timely basis. However, the market is already accustomed to this, as both Pacific Gas and Electric Company and San Diego Gas & Electric Company require generators to manage their own WREGIS accounts for the creation and transfer of RECs to the purchasing utility in their *pro forma* agreements.

7. Tax Credit Legislation: Section 1.05 and Former Sections 1.04(b), 1.10 and 2.03(a)(ii)

In the 2014 *Pro Forma*, SCE provided for a possible extension of the commercial operation deadline and/or a termination right for sellers in the event federal tax credit legislation was not extended beyond 2016 on terms similar to those available to projects that achieve commercial operation at the time the contract is executed. Those provisions are not included in the 2015 *Pro Forma* because of the anticipated timing of the 2015 RPS solicitation.

In 2014, the Commission concluded that the federal tax credit legislation language should remain in the 2014 *Pro Forma* because it was "still potentially feasible for some projects to qualify for the available tax credits and since there is a history of last-minute changes to these federal tax credit provisions."[67] That timing no longer applies for the 2015 RPS solicitation. In order for projects to qualify for the ITC in its current form, projects must achieve commercial operation by December 31, 2016. Given the anticipated timing of the 2015 RPS solicitation, including the time period needed for Commission approval of any executed PPAs and the time period needed for projects to be built and achieve commercial operation, there is an extremely low likelihood that any project participating in the 2015 solicitation will achieve commercial operation by December 31, 2016.

Currently, however, there is tax legislation at the federal level which contemplates an extension of the ITC at 30% beyond 2016.[68] Additionally, there may be other federal tax incentives specific to the development of renewable projects that neither sellers nor SCE are currently contemplating. To the extent sellers are able to take advantage of any new tax incentives not contemplated at the time of PPA execution, SCE proposes a discount to the contract price

[67] D.14-11-042 at 30.

related to any unforeseen tax benefits that would be triggered if applicable tax laws were to be extended or enacted. The amount of the discount will be an agreement between the parties, including those sellers who elect the Standard Contract Option. SCE has updated its 2015 *Pro Forma* to include language that implements this discount mechanism. This mechanism is appropriate as SCE customers should be entitled to unforeseen economic benefits received by a project due to a change in tax law. Otherwise, these benefits will be financial windfalls to developers while SCE customers pay a price based on more expensive economics.

8. **Levelized Performance Assurance: Section 1.06**

In the 2015 *Pro Forma*, SCE will require performance assurance to be posted in a single amount over the delivery term of the PPA (levelized), as opposed to bell-curve shaped amounts (shaped) as it has in the recent past. Shaped performance assurance postings require sellers to adjust the collateral amount multiple times during the delivery term, which is burdensome for both sellers and SCE, and potentially adds unnecessary costs to the PPA. A single, levelized posting requirement will decrease cost, reduce complexity, and simplify the PPA.

This change responds to the market and is a benefit to both sellers and SCE customers. During negotiations with sellers in the 2014 RPS solicitation, several sellers requested the levelized performance assurance posting requirement. A levelized performance assurance posting requirement results in lower administrative costs for sellers, who do not need to pay a bank annually to amend their letter of credit, as required by the different collateral amounts inherent in the shaped performance assurance curve. The cost to SCE's customers is also lessened due to the reduced volume of letters of credit amendments that must be processed.

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68 After the filing of SCE's original 2015 RPS Plan, the ITC was extended on December 18, 2015.

The average of the shaped performance assurance posting amounts is the same as the levelized performance assurance posting amount (i.e., 5% of the total project revenues). Thus, over the delivery period the risk profile is the same.

9. **Time of Delivery Factors: Exhibit I**

As the electricity market in California continues to evolve, as load forecasts change, and as resources are added and retired, it is increasingly appropriate and necessary to regularly update time-of-delivery ("TOD") factors. SCE has updated the TOD factors in its 2015 *Pro Forma* to reflect the changes to its forecast of load, resources, and additions and retirements.

10. **Confidentiality Provisions: Section 10.10 and Former Exhibit I**

SCE has revised the confidentiality provisions in the 2015 *Pro Forma* to eliminate Exhibit I, which was a stand-alone NDA applicable to the PPA. Instead, SCE will incorporate the material requirements from Exhibit I into the relevant confidentiality provisions in Section 10.10, as is done in all other SCE *pro forma* PPAs.

11. **Illustrating Contract Capacity in Both Alternating Current and Direct Current: Sections 1.01(h) and 1.05(c)(i)**

As penetration levels of variable energy resources like wind and solar increase, the CAISO and transmission providers face greater difficulty regulating voltage on the systems within their jurisdiction. As a result, reactive power requirements have become more critical, and many developers of solar photovoltaic projects in particular have sought to up-size their inverters and/or transformers to account for the likelihood of being called upon to produce VARs, and to account for losses within their collection systems. As there are no specific alternating current ("AC") nameplate capacity restrictions within the 2015 Procurement Protocol or program rules, SCE believes it is reasonable to allow developers to install more AC capacity than they plan to deliver

~~in order to account for reactive power requirements and losses, provided they utilize plant controllers to limit their AC output to their allotted interconnection capacity at the point of delivery. Therefore, SCE is modifying Section 1.01(h) and Section 1.05(c)(i) in the 2015 *Pro Forma* to require sellers to provide both the maximum output at the delivery point and the AC nameplate capacity of the generating facility. By requiring sellers to provide this information in the PPA, it provides SCE certainty on the amount of payments sellers receive for energy deliveries, while also affording sellers the ability to economically meet their reactive power obligations under their interconnection agreements.~~

~~12. **Supplier Diversity: Section 3.17(i)**~~

~~The 2014 *Pro Forma* already included a requirement to report payments made to Women-Owned, Minority-Owned, and Disabled Veteran-Owned Business Enterprises that supplied goods or services as subcontractors under a contract with SCE. The 2015 *Pro Forma* will include all Diverse Business Enterprises in that reporting requirement.~~

changes to the *Pro Forma* were either minor or clean-up items.[50] A redline of the 2016 Pro Forma showing all of the changes from the 2015 RPS Pro Forma is attached as Appendix F.2. Additionally, changes related specifically to the Standard Contract Option are mentioned in Section XVII.B. If SCE goes forward with a 2016 RPS solicitation it will include a Community Renewables solicitation. SCE will use the Community Renewables Rider ("CR Rider") to the 2015 Standard Contract Option, which SCE submitted to the Commission via Advice Letter 3422-E for its Community Renewables PPAs.

SCE will provide its 2016 *Pro Forma* Master Renewable Energy Credit Purchase Agreement with supplementary materials later in the 2016 RPS review process.

[50] SCE also made changes to the Green Rate provisions that mirror the CR-Rider.

C. Important Changes in ~~LCBF~~2016 Least Cost, Best Fit Methodology

1. ~~Valuation of Transmission Costs for Projects Located Within and Outside the CAISO Control Area~~Workforce Development

~~As discussed in Section III.F.1.b, SCE will only consider reimbursable transmission network upgrade costs that are paid by SCE customers in the LCBF evaluation process for the 2015 RPS solicitation. For projects connecting to the CAISO control area, this will be the share of costs that SCE's customers pay for reimbursable transmission network upgrade costs. For projects not connecting to the CAISO control area, it will be zero as none of those costs are paid by SCE's customers. For most of the projects connecting to the CAISO control area, the costs that SCE customers pay is determined based on a utility-specific Transmission Access Charge ("TAC") rate, which is based on a utility's load share. The CAISO publishes these rates every year.[69] SCE will use the latest rates available for SCE at the time of 2015 RPS solicitation evaluation process.~~

SCE will review information submitted by the bidders describing the impact of their project on employment growth as one of the qualitative factors that it considers in its evaluation of each bid, as further discussed in Section II.A.1(f) of Appendix H.1

2. ~~Selection of Projects Based on Qualitative Criteria~~Disadvantaged Communities

~~In the shortlist for the 2014 RPS solicitation, SCE selected resources according to the LCBF principles. When procuring resources for the long-term, SCE uses the LCBF methodology to ensure the portfolio increases the confidence level of meeting SCE's RPS goals. By~~

~~[69] CAISO TAC rates are available at: http://www.caiso.com/market/Pages/TransmissionOperations/Default.aspx.~~

~~diversifying SCE's portfolio based on LCBF, SCE considers generation profiles, energy and capacity values, renewable integration costs, locational congestion costs, and transmission costs where applicable.~~

~~However, when trying to meet portfolio fit objectives, using only NMV criterion may not help meet all the required objectives for procurement.~~ [redacted] ~~In the 2015 RPS solicitation, SCE will continue to use this approach and will continue to refine the approach based on changes to SCE's portfolio and updated RNS and load forecasts.~~

SCE will review information submitted by the bidders describing the impact of their project on disadvantaged communities as one of the qualitative factors that it considers in its evaluation of each bid, as further discussed in Section II.A.1(f) of Appendix H.1.

3. ~~SCE Experience with Developers as a Qualitative Factor for Shortlisting and Selection~~Selection Criteria for Community Renewables

~~In the 2015 RPS solicitation, SCE will add prior experience with renewable developers as a qualitative factor for consideration for both shortlisting and final selection purposes. In the past, SCE has encountered developers who have repeated issues that make for unsuccessful projects. Some examples include sellers executing PPAs and then not posting development security and~~

~~sellers who attest to having site control only to have SCE discover through negotiations that they in fact do not. These situations have posed problems in the administration of the solicitation. While they are more the exception than the norm, SCE would like the ability to take its experience with developers into account as a qualitative factor in the shortlisting and selection process in these rare, yet problematic situations.~~

If SCE holds a 2016 RPS solicitation, one of its two required Community Renewables solicitations will be part of the 2016 RPS solicitation. As a result, SCE added to its LCBF Methodology in Section III.A of Appendix H.1 a discussion of the bid evaluation and selection process for Community Renewables.

XVI.

SAFETY CONSIDERATIONS

SCE is strongly committed to safety in all aspects of its business. Renewable sellers are responsible for the safe construction and operation of their generating facilities and compliance with all applicable laws and safety regulations. SCE has taken several steps to address those issues over which it has the most visibility and control – the delivery of renewable electricity products to SCE in a reliable, safe, and operationally sound manner.

As with past RPS *pro forma* PPAs, SCE's ~~2015~~2016 *Pro Forma* provides that the seller must operate the generating facility in accordance with "Prudent Electrical Practices."~~70~~51 The detailed definition of "Prudent Electrical Practices" includes "those practices, methods and acts that would be implemented and followed by prudent operators of electric energy generating facilities in the Western United States, similar to the Generating Facility, during the relevant time period, which practices, methods and acts, in the exercise of prudent and responsible professional

~~70~~51 *See* ~~2015~~2016 *Pro Forma* (attached as Appendix G.1) at Section 3.12(a).

judgment in the light of the facts known or that should reasonably have been known at the time the decision was made, could reasonably have been expected to accomplish the desired result consistent with good business practices, reliability and safety. . . ."[71][52]

Consistent with SCE's focus on safety, SCE's 20152016 *Pro Forma* also provides that, prior to commencement of any construction activities on the project site, the seller must provide to SCE a report from an independent engineer certifying that seller has a written plan for the safe construction and operation of the generating facility in accordance with Prudent Electrical Practices.[72][53]

SCE also has a safety section in its 20152016 Procurement Protocol providing that sellers must possess a written plan for the safe construction and operation of the generating facility as set forth in the 20152016 *Pro Forma*.[73][54]

XVII.

STANDARD CONTRACT OPTION

In D.14-11-042, the Commission terminatedended the RAM program, as authorized in D.10-12-048, after the conclusion of the RAM 6 auction.[74][55] The Commission also authorized the IOUs to use an optional streamlined RAM procurement tool in future RPS solicitations.[75][56] The Commission directed the IOUs to include the streamlined procurement tool in their RPS Procurement Plans, at their discretion, starting with the 2015 RPS Procurement Plans.[76][57]

In itsAs in the 2015 RPS solicitation, SCE plans to include a "Standard Contract Option" using the RAM procurement tool in any 2016 RPS solicitation that it may conduct. Consistent with the Commission's intent to provide the IOUs with flexibility to optimize their portfolios

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[71][52] *See id.* at Exhibit A.
[72][53] *See id.* at Section 3.11(e).
[73][54] *See* 20152016 Procurement Protocol (attached as Appendix F.1) at Section 9.03.
[74][55] *See* D.14-11-042 at pp. 91-92, pp. 102-104.
[75][56] *See id.* at pp. 91-92.
[76][57] *See id.* at p. 92.

based on their procurement needs while providing a streamlined procurement tool,~~77~~58 the Standard Contract Option will allow for rapid development of renewable projects by avoiding the contract negotiation process and expediting the Commission approval process of executed PPAs. Sellers will have the option to participate in the Standard Contract Option by checking a box in the RPS proposal form. The ~~Standard Contract Option will only be available for proposals offering Category 1 products, and will not be available for proposals offering Category 2 or Category 3 unbundled REC products, where contract negotiations are likely to be required. Additionally, the~~ Standard Contract Option will only be available to projects with a first point of interconnection to the CAISO, and not to dynamically scheduled projects.~~78~~59

Subject to SCE's selection of the proposal and agreement that a standard contract is appropriate for the proposal, sellers will be offered a standard contract in the form of the ~~Negotiated Contract Option~~ ~~2015~~2016 *Pro Forma* with no negotiations. Once executed, the Standard Contract Option PPAs will be submitted to the Commission for approval via a Tier 2 advice letter. This process uses the same approval process as in RAM, which was one factor in SCE successfully procuring 787 MW of renewables over five years in six auctions. ~~The chart below illustrates the shorter timeframe for anticipated Commission approval that will benefit Standard Contract Option projects.~~79

In the sections below, SCE discusses the parameters of the Standard Contract Option and their consistency with D.14-11-042.

A. Procurement Need

In D.14-11-042, the Commission stated that the IOUs should explain in their RPS Procurement Plan filings how any proposed use of the streamlined RAM procurement tool could

~~77~~58 *See id.*

~~78~~59 SCE's ~~2015~~2016 *Pro Forma* is structured with the assumption that the generating facility will have a first point of interconnection with the CAISO. Accordingly, changes to the ~~2015~~2016 *Pro Forma* will be required for dynamically scheduled projects.

~~79 This chart overlays the actual schedules of the two most recent RPS and RAM procurements to illustrate the time saved by exercising the Standard Contract Option. The timeline illustrated in blue represents RPS, while the timeline in red is RAM.~~

satisfy an authorized procurement need, "including, for example, system Resource Adequacy needs, local Resource Adequacy needs, RPS needs, reliability needs, LCR needs, GTSR needs, and any need arising from Commission or legislative mandates."[80][60] In ~~the 2015~~a 2016 RPS solicitation, SCE will ~~primarily~~ use the Standard Contract Option to satisfy its RPS ~~procurement~~and energy needs. ~~However,~~ SCE will also use the Standard Contract Option ~~to satisfy its Green Rate~~for Community Renewables procurement needs as discussed in Section XVIII. Community Renewables has a Rider that modifies the Standard Contract Option, which is detailed in Section XVIII. SCE may also use the Standard Contract Option to fulfill other authorized procurement needs in the future.

B. Standard Contract

The Commission required IOUs to seek Commission authorization for a revised standard contract so that the RAM tool can continue to be a more streamlined contracting and approval process.[81][61] SCE ~~proposes to use the 2015~~uses its current *Pro Forma* as the standard contract for the Standard Contract Option. The ~~existing~~ RAM standard contract and SCE's RPS *pro forma* PPAs are closely aligned. Changes to the RPS *pro forma* PPA that were approved for use in RPS solicitations were subsequently requested and generally approved for use in the next RAM cycle, and vice versa. Additionally, both the RPS *pro forma* PPA and the RAM standard contract have been drafted in a manner that allows for the simple insertion of project specific information without any other modifications to the terms and conditions. Specifically, project-specific parameters can be inserted into the ~~2015~~2016 *Pro Forma* (e.g., project size, technology, location, and other project specific attributes), and the resulting contract will be the standard contract. Additional non-material ministerial changes to the ~~2015~~2016 *Pro Forma* may also be needed in the standard contracts; for example, to correct typographical errors or section references or delete definitions that are not needed for particular projects.

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[80][60] D.14-11-042 at p. 92.
[81][61] *See id.* at p. 93.

It will be considerably more efficient for SCE, the Commission, the parties, and the market to update one *pro forma* PPA each year, rather than having separate *pro forma* PPAs for Standard Contract Option and non-Standard Contract Option projects. Further, one *pro forma* PPA eliminates market distortions that might come from commercial differences that could skew sellers toward or away from the Standard Contract Option.

For 2016, SCE made changes applicable to the Standard Contract Option to: (i) the Commercial Operation Date, and (ii) extensions to the Commercial Operation Date. These changes were made to correct an error in the previously approved 2015 *Pro Forma* Standard Contract Option provisions, which incorrectly stated that the Commercial Operation Date must be no later than 24 months from CPUC Approval rather than 36 months from CPUC Approval.

C. Project Size Restrictions

The Commission eliminated the RAM project size restrictions for the streamlined RAM procurement tool and authorized the IOUs to establish project size requirements based on their specific procurement needs at the time of the solicitation.[82][62] SCE does not propose to include any project size restrictions for the Standard Contract Option in ~~the 2015~~a 2016 RPS solicitation. SCE will allow sellers to propose projects of any size, but not less than the minimum of 500 kilowatts for the ~~2015~~2016 solicitation.[83]

While SCE will allow sellers with projects of any size to select the Standard Contract Option, SCE must also agree that the Standard Contract Option is appropriate for the seller's proposed project. For proposals that state a preference for a standard contract, SCE reserves the right to discuss with a seller the need to negotiate certain terms and conditions when appropriate. Although project size is not the only example of a parameter that might trigger such a situation,

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[82][62] *See id.* at p. 94.

[83] ~~If SCE uses the Standard Contract Option for Green Rate procurement, that procurement would be limited to the project size restrictions of the Green Rate program (as well as project category, locational, and eligibility requirements as discussed below).~~

very large projects do often carry more complicated issues that warrant careful construction of a negotiated PPA. The Standard Contract Option will only be used if both SCE and the seller agree that it is appropriate for the specific project.

D. Project Categories

The Commission retained the RAM product category requirement (peaking, non-peaking, baseload), but did not mandate that the IOUs procure a specific amount from each product category.[84][63] ~~SCE will include the three product categories in its Standard Contract Option.~~ While SCE does not intend to set specific targets for each product category~~. Instead~~, SCE will consider all the product categories and they will be indicators of SCE's desire to balance the resources in its diverse renewables portfolio. SCE intends to conduct its selection process for both the negotiated track and the Standard Contract Option using LCBF criteria.

E. Restriction on Subdivided Projects

In D.14-11-042, the Commission eliminated the prohibition against subdivided projects participating in RAM, and required the IOUs to define the terms they will use to either include or exclude subdivided projects.[85][64] SCE sees no need to impose a restriction on subdivided projects in its Standard Contract Option for the ~~2015~~2016 RPS solicitation, particularly given that it is not imposing a size restriction.

F. Locational Restrictions

The Commission removed the requirement that RAM projects be located in the service territories of the IOUs, and permitted the IOUs to procure anywhere within the CAISO control area, including dynamically scheduled resources, to increase the available pool of resources.[86][65]

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[84][63] *See* D.14-11-042 at p. 95.
[85][64] *See id.* at p. 96.
[86][65] *See id.* at pp. 97-98.

SCE's Standard Contract Option for the ~~2015~~2016 RPS solicitation will be applicable to projects with a first point of interconnection to the CAISO control area, but will not include dynamically scheduled resources.~~87~~ Dynamically scheduled resources generally require some changes to SCE's RPS *pro forma* PPA.

G. Valuation and Selection

The Commission found it reasonable to require the IOUs to use the same valuation methodologies used in their RPS solicitations for the RAM procurement tool.~~88~~66 SCE will use its LCBF evaluation process for valuation and selection of Standard Contract Option projects. In order to be selected, the value of a Standard Contract Option project must be within the range established by the SCE's ~~2015~~2016 RPS solicitation shortlist based on SCE's LCBF methodology as described in Appendix ~~I~~H.1.~~89~~ This approach results in all projects being valued utilizing the same methodology, and lends fairness to the process while increasing competition among sellers.

H. Interconnection Studies

In D.14-11-042, the Commission required that projects participating in the RAM procurement tool process have a Phase II Interconnection Study (or the equivalent).~~90~~67 Consistent with that decision, SCE will apply the same Phase II Interconnection Study requirement to Standard Contract Option and non-Standard Contract Option projects in its ~~2015 RPS solicitation~~2016 RPS solicitation, except for projects located in the Western LA Basin and Goleta area where there is local reliability need. In those areas, a Phase I Interconnection Study will be required.

~~87 If SCE uses the Standard Contract Option for Green Rate procurement, that procurement would be limited by the locational restrictions of the Green Rate program.~~

~~88~~66 *See* D.14-11-042 at pp. 98-99.

~~89 If SCE uses the Standard Contract Option for Green Rate procurement, eligibility for the Green Rate program and the Green Rate program environmental justice reservation will be qualitative factors considered in the evaluation process.~~

~~90~~67 ~~*See* D.14-11-042~~*Id.* at p. 100.

I. Commercial Operation Deadline

For new projects, the Commission imposed a commercial operation deadline requirement for the RAM procurement tool of 36 months with a six month extension for regulatory delays.[91][68] The Commission also exempted existing projects from going through the RAM viability screens, which include: (1) site control; (2) development experience; (3) commercial technology; and (4) interconnection application.[92][69] SCE will include the 36 month commercial operation deadline with a six month extension for regulatory delays in its Standard Contract Option for new projects. Moreover, SCE does not intend to apply any separate RAM viability screens to Standard Contract Option projects. However, SCE does believe it is appropriate to apply the same eligibility requirements that apply to all other existing projects participating in the 2015[2016] RPS solicitation to Standard Contract Option projects. In particular, existing projects with interconnection agreements that terminate before the start of the new RPS PPA should be required to demonstrate that they will have a new interconnection agreement in place at the start of the new RPS PPA. Those existing projects with interconnection agreements that continue during the new RPS PPA should be required to demonstrate that they are not making any modifications that would prevent them from delivering under their existing interconnection agreements. Existing projects should not be permitted to circumvent solicitation eligibility requirements by selecting the Standard Contract Option.

J. Commission Approval Process

In D.14-11-042, the Commission permitted the IOUs to seek approval of RAM procurement tool projects through the Tier 2 advice letter process or to request approval of another approval process in their RPS Procurement Plans.[93][70] As noted above, SCE proposes to seek approval of Standard Contract Option projects through the Tier 2 advice letter process.

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[91][68] *See id.* at p. 101.
[92][69] *See id.*
[93][70] *See id.*

XVIII.

GREEN TARIFF SHARED RENEWABLES PROGRAM

On September 28, 2013, Governor Brown signed SB 43 into law.[94][71] SB 43 enacted the GTSR program, a 600 MW statewide program that allows participating utilities' customers – including local governments, businesses, schools, homeowners, municipal customers, and renters – to meet up to 100% of their energy usage with generation from eligible renewable energy resources. As required by SB 43, all of the IOUs filed applications with the Commission requesting approval of GTSR programs consistent with the requirements and intent of the statute.

On January 29, 2015, the Commission adopted D.15-01-051, implementing a GTSR program framework and approving the IOUs' applications with modifications. Among other things, the Commission divided the GTSR program's statewide limitation of 600 MW of customer participation among the IOUs. Specifically, the Commission allocated 269 MW to SCE.[95][72] SB 43 also provides that 100 MW of the statewide limitation for the GTSR program shall be reserved for facilities that are no larger than 1 MW and that are located in areas previously identified by the California Environmental Protection Agency as "the most impacted and disadvantaged communities.[96]" [73] (referred to as "environmental justice" or "EJ" projects by SCE). To implement this statutory provision, the Commission established environmental justiceEJ and residential reservations for each IOU, including 45 MW forto SCE.[97][74]

The GTSR program structure approved by the Commission consists of two elements: (1) a green tariff option (called the "Green Rate" by SCE) allowing customers to purchase energy with a greater share of renewables, and (2) an enhanced community renewables option (called the

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[94][71] SB 43 was codified in California Public Utilities Code Section 2831 *et seq*.

[95][72] *See* D.15-01-051 at Ordering Paragraph 7.

[96] Cal. Pub. Util. Code § 2833(d)(1).

[73] CAL. PUB. UTIL. CODE § 2833(d)(1).

[97][74] *See* D.15-01-051 at Ordering Paragraph [7].7 and D.15-01-051 at pp. 4-5.

"Community Renewables" or "CR" program" by SCE) allowing customers to subscribe to renewable energy from community-based projects.[98][75] With regard to the Green Rate, SCE has already procured its 50 MW advance procurement requirement in its 2015 RPS solicitation. SCE does not anticipate doing additional Green Rate procurement in the 2016 RPS solicitation. This is because the Green Rate program currently has a limited number subscribed customers and SCE's advance procurement is expected to satisfy initial customer enrollment.

A. Community Renewables - Background

The Commission authorized RAM as a procurement mechanism for the ~~Green Rate~~CR program, including the streamlined RAM procurement tool that can be used as part of the IOUs' RPS solicitations.[99] ~~Community Renewables program procurement must occur through ReMAT.~~[100][76] The Commission limited initial procurement to new solar facilities ~~sized between 0.5 MW and 20 MW for the Green Rate and new solar facilities sized~~ between 0.5 MW and 3 MW ~~for the Community Renewables program.~~[101][77] ~~There are also other eligibility requirements, including that all of SCE's GTSR resources~~ but modified this in D.16-05-006 to include all eligible renewable resources between 0.5 MW and 20 MW for CR projects and all eligible renewable resources between 0.5 MW and 1 MW for CR-EJ projects.[78] CR projects must be located within SCE's service territory,[102] ~~and that Community Renewables program resources meet certain community interest requirements.~~[103][79] and must satisfy the eligibility requirements associated with the RAM procurement tool.[80]

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[98][75] See *id.* at pp. 3-4.

[99] ~~*See id.* at 21-23, Conclusion of Law 7.~~

[100][76] *See id.* ~~at 61.~~Ordering Paragraph 1.

[101][77] *See id.* at pp. 36-37, p. 39, Conclusion of Law 17.

[78] *See* D.16-05-006, Conclusions of Law 2 and 4.

[102] ~~*See id.* at 35, Conclusion of Law 14.~~

[79] *See* D.15-01-051 at pp. 21-23, Conclusion of Law 14.

[103][80] *See* ~~*id.*~~D.16-05-006 at ~~67-68,~~p. 35, Conclusion of Law ~~25-26.~~ 4.

SCE has filed several advice letters to implement the ~~GTSR~~CR program, including: (i) Advice 3180-E ~~setting forth SCE's plan for advance procurement for the GTSR program and~~ identifying the eligible census tracts for ~~environmental justice~~EJ projects in its service territory;~~[104]~~[81] ~~Advice 3195-E making the changes to its RAM 6 PPA and RFO instructions needed to accommodate advance GTSR program procurement,~~[105] (ii) Advice 3218-E, which is the IOUs' Joint Procurement Implementation Advice Letter~~,~~; (iii) Advice 3219-E, which is SCE's Customer-Side Implementation Advice Letter~~, and~~; (iv) Advice 3220-E, which is SCE's Marketing Implementation Advice Letter.~~[106]~~[82] ~~In accordance with D.15-01-051 and Advice 3195-E, SCE sought to procure 50 MW of Green Rate-eligible resources through the RAM 6 auction in order to meet its advance procurement need. SCE was only able to procure 20 MW through the RAM 6 auction and thus intends to solicit at least 30 MW of Green Rate-eligible resources through the 2015 RPS solicitation. SCE plans to procure Green Rate-eligible resources through the Standard Contract Option portion of the RPS solicitation. SCE will provide Green Rate-eligible resources the option to select consideration for the Green Rate program, in addition to consideration for the RPS program, as part of the solicitation.~~[107] (v) Advice 3432-E, which is the 20 Year Forecast of GTSR bill credits and charges;[83] and (vi) Advice 3422-E, which makes changes to SCE's 2015 *Pro Forma* Renewable Power Purchase and Sale Agreement, Standard Contract Option and RFO instructions, needed to implement the CR program through the RAM procurement tool consistent with D.16-05-006 (the "CR-RAM RFO"), and also requested closure

~~104~~81 Advice 3180-E was approved by the Energy Division effective as of February 23, 2015.

~~105 Advice 3195-E was approved by the Energy Division effective as of April 20, 2015.~~

~~106~~82 The Commission approved Advice 3218-E, 3219-E, and 3220-E, with modifications, in Resolution E-4734.

~~107 Community Renewables procurement will occur through a Community Renewables Project Development Tariff and a Community Renewables Program Project Development Tariff Rider and Amendment to the standard ReMAT PPA~~[83] SCE submitted Advice 3432-E on July 11, 2016, which has not been approved as of the date of this filing.

of SCE's CR-MAT program because projects eligible for SCE's CR-MAT program will also be eligible for SCE's CR-RAM program. [84]

~~Going forward, on an annual basis, SCE plans to assess its Green Rate procurement need in each RPS Procurement Plan and set Green Rate procurement targets for each solicitation, if any, based on incremental customer enrollments and the amount of dedicated Green Rate. Beyond SCE's remaining advance procurement need of 30 MW, SCE does not anticipate additional Green Rate procurement need for the 2015 RPS solicitation. The Green Rate has not yet launched for customers so there are no incremental customer enrollments. Moreover, SCE's total advance procurement target of 50 MW is expected to fulfill initial customer enrollments.~~

B. Community Renewables - Modifications to the 2016 Procurement Protocol, 2016 Pro Forma Standard Contract Option, and LCBF Methodology

SCE has incorporated CR-related modifications into its 2016 Procurement Protocol, created a CR Rider and Amendment to the 2016 *Pro Forma* Standard Contract Option, and incorporated modifications to its LCBF Methodology for CR and CR-EJ eligible projects. SCE will include a Community Renewables solicitation in any 2016 RPS solicitation that it decides to have. If SCE does not go forward with a 2016 RPS solicitation, it will move forward separately with a second Community Renewables Solicitation.

1. 2016 Procurement Protocol – CR Modifications

~~SCE has incorporated Green Rate-related modifications into its 2015 Procurement Protocol, 2015 *Pro Forma*, and LCBF Methodology. To be considered for the Green Rate program, Green Rate-eligible~~The 2016 Procurement Protocol includes additional requirements applicable only to CR and CR-EJ projects. CR and CR-EJ projects must agree to participate in the

[84] SCE submitted Advice 3422-E on June 15, 2016, which has not been approved as of the date of this filing.

RAM tool via the 2016 Pro Forma Standard Contract Option and CR Rider and Amendment, consistent with the Commission's direction in D.15-01-~~051.[108] SCE's 2015 *Pro Forma* includes an additional representation and warranty only applicable to Green Rate projects, indicating that projects must be eligible for Green-e Energy© certification and maintain this eligibility. This is similar to the language included in the standard RAM 6 PPA, except that a new representation and warranty has been included applicable only to Green Rate projects related to Green-e Energy© certification.[109] As part of the GTSR program, the Commission directed the IOUs to seek Green-E Energy© certification of their GTSR programs.[110]~~051 and D.16-05-006.[85] The Procurement Protocol also contains specific instructions applicable to CR and CR-EJ projects only, including:

- RAM Eligibility: CR and CR-EJ projects must comply with the eligibility requirements of applicable to the RAM procurement tool.
- Contract Capacity: CR projects must have a minimum project size of 0.5 MW and a maximum project size of 20 MW; and CR-EJ projects must have a minimum project size of 0.5 MW and a maximum project size of 1 MW.
- Procurement Targets: 75 MW is identified as the minimum procurement target ("Minimum Procurement Target").
- Community Interest: CR and CR-EJ projects must demonstrate fulfillment of the community interest requirements pursuant to Decisions 15-01-051 and 16-05-006 within 60 days of notification of contract award or the awarded capacity may be assigned to the next highest ranking LCBF CR or CR-EJ project offer. In addition, at least 50% (by number of customers) and at least 1/6th of the demonstrated community interest in CR and CR-EJ projects must come from residential customers.

~~[108] *See* D.15-01-051 at 21-23, Conclusion of Law 7.~~

~~[109] The Commission approved the RAM 6 PPA when it approved Advice 3195-E in a disposition letter on June 17, 2015.~~

~~[110]~~[85] *See* D.15-01-051 at pp. 21-23, Conclusion of Law 7, and D.16-05-006 Ordering Paragraph ~~20.~~1.

2. 2016 *Pro Forma*, Standard Contract Option – CR Rider and Amendment Modifications

In Advice Letter 3422-E, pursuant to D.16-05-006, SCE transferred the previously approved CR and CR-EJ program, as well as the CR-MAT Rider and Amendment provisions to the RAM tool, creating a CR-RAM Rider and Amendment to the approved 2015 RPS *Pro Forma* Standard Offer Contract (the "Current CR-RAM Rider"). The Current CR-RAM Rider will work with the 2016 RPS *Pro Forma* Standard Offer Contract because it contains only minor changes from the 2015 RPS *Pro Forma* Standard Offer Contract. The Current CR-RAM Rider included a number of modifications necessary to implement the requirements of D.16-05-006. SCE intends to utilize the Current CR-RAM Rider, as modified by any future supplemental advice letters or as required by the Commission (the "Approved CR-RAM Rider") to procure CR-eligible resources as part of any the 2016 RPS solicitation that it may decide to hold. If SCE does not decide to hold a 2016 RPS solicitation, it will hold a second CR solicitation.

3. LCBF – CR Modifications

As with other RPS-eligible projects, ~~Green Rate~~CR and CR-EJ projects will be selected using the LCBF methodology~~. Qualitative factors have been added to SCE's LCBF methodology to indicate that Green Rate eligibility, Green Rate environmental justice eligibility, and a developer's affirmative "opt in" to consideration for the Green Rate program will be considered during the selection process when there is a Green Rate procurement need.~~, subject to the additional selection criteria as follows: (i) SCE may decline to award contracts to developers that bid a price in excess of 120 percent (for CR projects) and 200 percent (for CR-EJ projects) of the maximum executed contract price in either the RAM as-available peaking category or the Green Rate program, whichever occurred most recently ("Procurement Price Limits");[86] (ii) when Minimum Procurement Targets are exceeded, first, SCE must select the LCBF CR-EJ projects

[86] *See* D.16-05-006 at Ordering Paragraph 3.

with offer prices less than the Procurement Price Limit up to the EJ reservation amount established in D.15-01-051, then SCE will evaluate all remaining projects against one another on a LCBF basis and SCE must select those projects with offer prices less than the applicable Procurement Price Limit, up to the Procurement Target.[87]

C. Green Rate and Community Renewables – Annual Reporting

In D.15-01-051, the Commission directed the IOUs to include certain additional information in ~~their RPS Procurement Plans, including their progress in~~an annual report (the "GTSR Report").[88] The GTSR Report will be filed on September 1, 2016 and will include: (i) progress toward GTSR procurement ~~and towards the environmental justice~~, including EJ and residential reservations, (ii) information on the transfer of capacity between the GTSR and RPS programs, and the cost impacts of that transfer and impact on the IOUs' RNS, ~~and certain reporting.[111] As discussed above, the GTSR program has not yet been implemented for customers and SCE has only just begun to procure dedicated GTSR projects. Therefore, SCE does have any information to include in this 2015 RPS Plan. SCE will include this information in future RPS Procurement Plans.~~(iii) the need, if any, to bridge for any shortfall, (iv) accounting of RECs, and (v) a list of contracts with price, and other relevant details.[89]

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87 *See* Ordering Paragraph 2.
88 *See* D.15-01-051 at pp. 32-33, p. 41, pp. 68-69, and p. 143.
~~111 *See id.* at 32-33, 41, 68-69, 143.~~
89 *See* Advice 3218-E at p. 24 and p. 32.

XIX.

OTHER RPS PLANNING CONSIDERATIONS AND ISSUES

A. Bilateral Transactions

As part of its overall procurement strategy, SCE may engage in bilateral negotiations for renewable energy purchases or sales subject to the Commission's review and approval of completed transactions.

~~B. Short Term Products~~

~~SCE's 2015 RPS solicitation will be limited to long-term Category 1, Category 2, and Category 3 unbundled REC products. SCE may, however, conduct an RFI, another solicitation, or bilateral negotiations for short-term Category 1, Category 2, or Category 3 unbundled REC products. Such processes will provide SCE with valuable information on the market for short-term renewable products. Moreover, procurement of short-term products could help SCE optimize its portfolio and minimize RPS procurement costs for its customers.~~

B. ~~C.~~ Energy Storage Procurement

Public Utilities Code Section 2837 requires the IOUs' RPS Procurement Plans to incorporate any energy storage targets and policies that are adopted by the Commission as a result of its implementation of AB 2514. To implement AB 2514, the Commission adopted D.13-10-040, which implemented an energy storage procurement framework and design. The Commission also directed SCE to procure 580 MW of energy storage by 2020, with projects installed and delivering by 2024.~~11~~[2][90]

SCE conducted ~~its~~a 2014 Energy Storage RFO to help meet the target identified in D.13-~~-~~10-040. SCE signed three contracts from that RFO for a total of 16.3 MW. ~~SCE will file its~~

~~11~~[2][90] *See* D.13-10-040 at ~~15,~~p. 15 and p. 26.

~~2016 Energy Storage Procurement Plan on March 1, 2016.In addition to the~~Additionally, SCE launched an Aliso Canyon Energy Storage RFO~~, SCE also encourages sellers to submit proposals including energy storage in its RPS solicitations, including the 2015 RPS~~ in June 2016 and is currently evaluating the offers received.

SCE will allow proposals with energy storage in a 2016 RPS solicitation where the seller controls the storage. Because of SCE's limited RPS needs, SCE does not intend to solicit RPS projects with energy storage where SCE controls the dispatch or charging of the storage units. Instead, SCE will consider such energy storage offers in its 2016 Energy Storage solicitation.

Document comparison by Workshare Compare on Friday, August 05, 2016 9:58:36 AM

Input:	
Document 1 ID	file://H:\Schmid-Frazee\RPS\Final 2015 RPS Procurement Plan - Written Plan (PUBLIC).docx
Description	Final 2015 RPS Procurement Plan - Written Plan (PUBLIC)
Document 2 ID	file://H:\Schmid-Frazee\RPS\01 2016 RPS Plan (PUBLIC).docx
Description	01 2016 RPS Plan (PUBLIC)
Rendering set	Standard

Legend:	
Insertion	
~~Deletion~~	
~~Moved from~~	
Moved to	
Style change	
Format change	
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Inserted cell	
Deleted cell	
Moved cell	
Split/Merged cell	
Padding cell	

Statistics:	
	Count
Insertions	791
Deletions	870
Moved from	25
Moved to	25
Style change	0
Format changed	0
Total changes	1711

PUBLIC APPENDIX B

Project Development Status Update

Project Status	Project ID	Project Name	Contract Status	Site Control Status	Permit Type	Permit Status	Expected or Actual permitting completion date	Transmission secured?	Financing secured?	Equipment secured?
In Construction	1238	Republic Services of Sonoma	Approved		US EPA Title V Permit, Major Facility Review Permit, Bay Area Air Quality Management District Permit to Operate, CalRecycle Solid Waster Facility Permit, Sonoma County CUP	Complete	12/18/2015			
In Development	4316	Walnut Valley Water District	No Approval Needed		NA			Yes		
In Construction	5218	Desert Stateline	Approved		FLPMA ROW Grant, CWA, Construction	Complete	Q4 2014	Yes		
Pre-Construction	5219	Mirasol Murrieta 1	Approved		CUP			Yes		
Pre-Construction	5220	Mirasol Pomona 1	Approved		CUP			Yes		
Pre-Construction	5222	SunE (Bell Tustin)	Pending Approval		Bulding Permit, Electrical Permit					
Pre-Construction	5223	SunE (Red Hill)	Pending Approval		Bulding Permit, Electrical Permit					
Pre-Construction	5226	Caliente Springs, LLC	No approval needed		CUP and construction			Yes		
In process	5245	RE: Walker Pass	Approved		CUP					
In process	5246	RE: Tranquility 8	Approved		CUP					
Pre-Construction	5251	Milestone Wildomar, LLC	No Approval Needed		CUP					
In Construction	5284	Silver State Solar Power, LLC	Approved		BLM ROD/ROW / AFC	Complete	Q4 2014	Yes		
In Construction	5405	SUNRAY SEGS I	Approved		San Bernardino CUP, Building Permit					
Pre Construction	5468	North Lancaster Ranch, LLC (A&R)	Approved		CUP			Yes		
Existing Facility	5476	American Solar Greenworks, LLC (A&R)	Approved		CUP	Complete	6/11/2014	Yes		
In Development	5485	Nicolis, LLC (Weldon Solar)	Approved		CUP, Construction, grading	Complete	10/22/2014	Yes		
In Development	5490	Tropico, LLC (Great Lakes)	Approved		CUP, Construction, grading	Complete	10/22/2014	Yes		
Construction Completed	5494	McCoy Solar, LLC	Approved		CEQA, BLM	Complete	CEQA (3/11/2014); BLM (6/13/14)	Yes		
Pre-construction	5519	One Ten Partners, LLC	Approved		TBD			Yes		
In Construction	5625	US Topco Energy, Inc. (Soccer Center)	Approved		CUP	Complete	7/10/2015	Yes		
Pre-Construction	5744	PVNavigator, LLC	Approved		CUP, Construction & Building			Yes		
Pre-Construction	5747	AVS Phase 2	Approved		CUP					
Pre Construction	5748	Lancaster WAD B, LLC	Approved		CUP	Complete	9/24/2014	Yes		
Pre Construction	5762	Central Antelope Dry Ranch B, LLC	Approved		CUP	Complete	6/16/2014	Yes		
In Construction	5788	Lancaster Solar 1	Approved		CUP	Complete	12/31/2014	Yes		
In Construction	5791	SunE - Rochester	Approved		City Building Permit	Complete	10/28/2015	Yes		
In Construction	5804	Copper Mountain Solar 4, LLC	Approved		Nevada Utility Environmental Protection Act Order	Complete	10/29/2014	Yes		
Pre-Construction	5805	88FT 8ME LLC (Mount Signal II)	Approved		CUP, IID Encroachment Agreement, Construction & Building	Complete	6/15/2015	Yes		
Pre-Construction	5808	93LF 8ME LLC (Mount Signal V)	Approved		CUP, IID Encroachment Agreement, Construction & Building	Complete	6/15/2015	Yes		
Pre-Construction	5810	41MB 8ME LLC	Approved		CUP, Construction & Building					
In process	5811	RE Tranquillity LLC	Approved		CUP					
Pre-Construction	5813	Tribal Solar, LLC	Approved		UEPA/BLM ROW/SUP/ESA/CHR/404/DCP					
Pre-Construction	5814	North Rosamond Solar, LLC	Pending CPUC Approval		CUP					
In Construction	5816	Panoche Valley Solar, LLC	Approved		CUP	Complete	6/14/2106			
Already built	5817	Luz Solar Partners Ltd, III (SEGS III) (f/k/a 5017)	Not yet approved		n/a	Complete	N/A	Yes		
Already built	5818	Luz Solar Partners Ltd, IV (SEGS IV) (f/k/a 5018)	Not yet approved		n/a	Complete	N/A	Yes		
Already built	5819	Luz Solar Partners Ltd, V (SEGS V) (f/k/a 5019)	Not yet approved		n/a	Complete	N/A	Yes		
Pre Construction	5822	Longboat Solar, LLC	Approved		CUP	Complete	12/29/2015	Yes		
In Construction	5823	Algonquin SKIC 10 Solar, LLC	Approved		CUP	Complete	12/16/2015	Yes		
Pre-Construction	5826	Portal Ridge Solar B, LLC	Approved		CUP/Building Permit/EWG FERC cert					
Pre-Construction	5827	Rio Bravo Solar I, LLC	Approved		construction	Complete	5/31/2016	Yes		
Pre-Construction	5828	Rio Bravo Solar II, LLC	Approved		construction	Complete	5/31/2016	Yes		
Pre-Construction	5829	Wildwood Solar II, LLC	Approved		construction	Complete	5/31/2016	Yes		
Pre-Construction	5833	Jacumba Solar, LLC	Approved		CUP			Yes		
In process	5834	RE Garland A, LLC	Approved		CUP					
In Construction	5835	CED Ducor 1, LLC	Approved		CUP			Yes		
In Construction	5836	CED Ducor 2, LLC	Approved		CUP			Yes		
In Construction	5837	CED Ducor 4, LLC	Approved		CUP			Yes		
In Construction	5838	CED Ducor 3, LLC	Approved		CUP			Yes		
Pre-Construction	5840	Joshua Tree Solar Farm, LLC	Approved		CUP			Yes		

Project Status	Project ID	Project Name	Contract Status	Site Control Status	Permit Type	Permit Status	Expected or Actual permitting completion date	Transmission secured?	Financing secured?	Equipment secured?
In process	5844	SunE- Victorville	Approved		Building, Electrical					
In process	5845	SunE- Elm Fontana	Approved		Building, Electrical					
In process	5846	SunE- Cherry Fontana	Approved		Building, Electrical					
[redacted]	5847	SunE- Fontana	[redacted]							
In process	5859	Boomer Solar 2	Approved		Building, Electrical					
In process	5860	Boomer Solar 6	Approved		Building, Electrical					
In process	5861	Boomer Solar 7	Approved		Building, Electrical					
In process	5865	Boomer Solar 12	Approved		Building, Electrical					
In process	5867	Boomer Solar 15	Approved		Building, Electrical					
In process	5869	Boomer Solar 17	Approved		Building, Electrical					
In process	5870	Boomer Solar 18	Approved		Building, Electrical					
In process	5871	Boomer Solar 22	Approved		Building, Electrical					
In process	5872	SunE- Quarry Corona	Approved		Building, Electrical					
In Construction	5874	Golden Springs Building F	Approved		City, AHJ Building			Yes		
In Construction	5875	Golden Springs Building G	Approved		City, AHJ Building			Yes		
In Construction	5876	Golden Springs Building L	Approved		City, AHJ Building			Yes		
In Construction	5877	Freeway Springs	Approved		City, AHJ Building			Yes		
In Construction	5878	Dulles	Approved		City, AHJ Building			Yes		
In Construction	5880	Mesquite Solar 2	Approved		Special Use Permit	Complete	12/31/2015	Yes		
Pre-Construction	5882	Sun Streams, LLC	Pending CPUC Approval		SUP/CEC					
Pre-Construction	5883	Willow Springs Solar, LLC	Pending CPUC Approval		CUP Nye County Dev. Agreement/UEPA/US					
Pre-Construction	5884	Sunshine Valley Solar, LLC	Pending CPUC Approval		FWSH					
In Construction	5885	Blythe Solar II, LLC	Approved		Construction	Complete	Q1 2016	Yes		
Pre-Construction	5886	Valentine Solar, LLC	Pending Approval		CUP	[redacted]		Yes		
In process	5888	RE Garland, LLC	Approved		CUP	Complete	3/31/2016	Yes		
Pre-Construction	5889	Blythe Solar III, LLC	Not yet approved		Construction	Complete	Q1 2019	Yes		
Pre-Construction	6368	Broadview Energy KW, LLC	Approved		Construction	Complete	Q3 2016	Yes		
Pre-Construction	6369	El Cabo Wind, LLC	Approved		CUP, Construction & Building	[redacted]		Yes		
Pre-Construction	6372	Tule Wind	Approved		CUP, Construction & Building			Yes		
Pre-Construction	6379	Broadview Energy JN, LLC	Approved		Construction	Complete	Q3 2016	Yes		
Pre-Construction	6380	Voyager Wind I, LLC	Approved		CUP, Construction & Building	[redacted]		Yes		

PUBLIC APPENDIX C.1

Physical Renewable Net Short Calculations Based on CPUC Assumptions

Physical Renewable Net Short Calculations Based on CPUC Assumptions

Variable	Calculation	Item	Deficit from RPS prior to Reporting	2011 Actuals	2012 Actuals	2013 Actuals	2011-2013	2014 Actual	2015 Actual	2016 Forecast	2014-2016	2017 Forecast	2018 Forecast	2019 Forecast	2020 Forecast	2017-2020	2021 Forecast	2022 Forecast	2023 Forecast	2024 Forecast	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast
		Forecast Year					CP1			1	CP2	2	3	4	5	CP3	6	7	8	9	10	11	12	13	14	15
		Annual RPS Requirement																								
A		**Bundled Retail Sales Forecast (LTPP)** [1]		73,777	75,597	74,480	223,854	75,829	75,322						71,316		76,194	76,660	76,980	77,205	72,103	72,974	74,041	75,105	76,002	77,065
B		RPS Procurement Quantity Requirement (%)		20.0%	20.0%	20.0%		21.7%	23.3%	25.0%		27.0%	29.0%	31.0%	33.0%		34.8%	36.5%	38.3%	40.0%	41.7%	43.3%	45.0%	46.7%	48.3%	50.0%
C	A*B	**Gross RPS Procurement Quantity Requirement (GWh)**		14,755	15,119	14,896	44,771	16,455	17,550						23,534		26,478	27,981	29,445	30,882	30,043	31,622	33,318	35,049	36,734	38,533
D		Voluntary Margin of Over-procurement		-	-	-	-	-	0	0	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
E	C+D	**Net RPS Procurement Need (GWh)**		14,755	15,119	14,896	44,771	16,455	17,550						23,534		26,478	27,981	29,445	30,882	30,043	31,622	33,318	35,049	36,734	38,533
		RPS-Eligible Procurement																								
Fa		**Risk-Adjusted RECs from Online Generation**		15,654	15,817	16,535	48,006	17,731	18,214	19,719	55,663	19,293	19,192	18,361	17,499	74,345	16,861	16,769	16,714	16,614	16,544	16,298	14,836	13,489	13,314	12,049
Faa		Forecast Failure Rate for Online Generation (%)		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Fb		**Risk-Adjusted RECs from RPS Facilities in Development**		-	-	-	-	-	102	1,801	1,904	4,265	5,315	6,430	8,892	24,903	9,057	9,017	8,976	8,956	8,896	8,856	8,816	8,797	8,738	8,699
Fbb		Forecast Failure Rate for RPS Facilities in Development (%)		*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*11.6%*	*11.0%*	*16.8%*	*16.8%*	*19.8%*	*26.0%*	*21.1%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*
Fc		**Pre-Approved Generic RECs**		-	-	-	-	-	-	-	-	21	75	291	440	827	573	760	934	941	938	938	938	941	938	938
Fe		**Executed REC Sales**		362	778	473	1,614	-	-	404	404	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F	Fa+Fb+Fc-Fe	**Total RPS Eligible Procurement (GWh)** [2]		15,291	15,039	16,062	46,392	17,731	18,316	21,116	57,163	23,579	24,582	25,082	26,831	100,074	26,492	26,546	26,624	26,511	26,377	26,092	24,590	23,226	22,990	21,686
F0		Category 0 RECs [3]		15,239	14,905	15,806	45,949	16,492	15,169	15,558	47,218	14,305	12,923	11,761	10,916	49,905	10,304	10,229	10,224	10,127	10,093	9,905	9,733	9,716	9,562	8,307
F1		Category 1 RECs [3]		52	134	256	443	1,240	3,147	5,558	9,945	9,253	11,584	13,031	15,475	49,342	15,615	15,556	15,465	15,443	15,346	15,249	13,919	12,570	12,490	12,441
F2		Category 2 RECs [3]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3		Category 3 RECs [3]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Gross RPS Position (Physical Net Short)																								
Ga	F-E	**Annual Gross RPS Position (GWh)**		536	(80)	1,166	1,622	1,277	766						3,297		14	(1,435)	(2,821)	(4,372)	(3,666)	(5,530)	(8,728)	(11,823)	(13,744)	(16,847)
Gb	F/A	Annual Gross RPS Position (%)		20.7%	19.9%	21.6%	20.7%	23.4%	24.3%						37.6%		34.8%	34.6%	34.6%	34.3%	36.6%	35.8%	33.2%	30.9%	30.2%	28.1%
		Application of Bank																								
Ha		**Existing Banked RECs above the PQR**		0	536	447	0	1,583	2,858	3,591	1,583				16,479		19,729	19,729	19,729	19,729	19,729	19,729	19,729	19,729	19,729	19,729
Hb		RECs above the PQR added to Bank		536	(89)	1,136	1,583	1,275	734						3,251		-	-	-	-	-	-	-	-	-	-
Hc		Non-bankable RECs above the PQR		-	9	30	39	2	32						46		14	-	-	-	-	-	-	-	-	-
H	Ha+Hb	**Gross Balance of RECs above the PQR**		536	447	1,583	1,583	2,858	3,591						19,729		19,729	19,729	19,729	19,729	19,729	19,729	19,729	19,729	19,729	19,729
Ia		Planned Application of RECs above the PQR towards RPS Compliance		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ib		Planned Sales of RECs above the PQR		0	0	0	-	0	0	0	-	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0
J	H-Ia-Ib	**Net Balance of RECs above the PQR**		536	447	1,583	1,583	2,858	3,591						19,729		19,729	19,729	19,729	19,729	19,729	19,729	19,729	19,729	19,729	19,729
J0		Category 0 RECs [3]		1,140	-	-	1,140	-									-	-	-	-	-	-	-	-	-	-
J1		Category 1 RECs [3]		52	134	256	443	1,240	3,147								-	-	-	-	-	-	-	-	-	-
J2		Category 2 RECs [3]		-	-	-	-	-									-	-	-	-	-	-	-	-	-	-
		Expiring Contracts																								
K		RECs from Expiring RPS Contracts								1,010	1,010	1,678	2,100	3,213	4,069	11,059	4,648	4,961	5,059	5,207	5,204	5,409	5,597	5,643	5,750	6,226
		Net RPS Position (Optimized Net Short)																								
La	Ga+Ia-Ib-Hc	**Annual Net RPS Position after Bank Optimization (GWh)**		536	(89)	1,136	1,583	1,275	734						3,251		-	(1,435)	(2,821)	(4,372)	(3,666)	(5,530)	(8,728)	(11,823)	(13,744)	(16,847)
Lb	(F+Ia-Ib-Hc)/A	Annual Net RPS Position after Bank Optimization (%)		20.7%	19.9%	21.5%	20.7%	23.4%	24.3%						37.6%		34.8%	34.6%	34.6%	34.3%	36.6%	35.8%	33.2%	30.9%	30.2%	28.1%

Note Fields in grey are potected as Confidential under CPUC Confidentiality Rules

Note Values are shown in GWhs

Notes:

1 Bundled retail sales forecast for 2016-2020 and 2025-2030 is from SCE's bundled retail sales forecast; bundled retail sales forecast for 2020-2024 is forecast used in 2014 LTPP

2 Includes all contracts executed through June 30, 2016; new generation forecast based on individual project specific success rates for large near-term projects and flat average success rate for remaining projects based on these projects' overall weighted average success rate

3 Forecast of deliveries by portfolio content categories is for executed contracts only; does not include program generics

PUBLIC APPENDIX C.2

Physical Renewable Net Short Calculations Based On SCE Assumptions

Physical Renewable Net Short Calculations Based on SCE Assumptic

Variable	Calculation	Item	Deficit from RPS prior to Reporting	2011 Actuals	2012 Actuals	2013 Actuals	2011-2013 CP1	2014 Actual	2015 Actual	2016 Forecast 1	2014-2016 CP2	2017 Forecast 2	2018 Forecast 3	2019 Forecast 4	2020 Forecast 5	2017-2020 CP3	2021 Forecast 6	2022 Forecast 7	2023 Forecast 8	2024 Forecast 9	2025 Forecast 10	2026 Forecast 11	2027 Forecast 12	2028 Forecast 13	2029 Forecast 14	2030 Forecast 15
		Forecast Year					CP1			1	CP2	2	3	4	5	CP3	6	7	8	9	10	11	12	13	14	15
		Annual RPS Requirement																								
A		SCE Bundled Sales Forecast [1]		73,777	75,597	74,480	223,854	75,829	75,322						71,316		70,765	70,724	71,006	71,659	72,103	72,974	74,041	75,105	76,002	77,065
B		RPS Procurement Quantity Requirement (%)		20 0%	20 0%	20 0%		21 7%	23 3%	25 0%		27 0%	29 0%	31 0%	33 0%		34 8%	36 5%	38 3%	40 0%	41 7%	43 3%	45 0%	46 7%	48 3%	50 0%
C	A*B	Gross RPS Procurement Quantity Requirement (GWh)		14,755	15,119	14,896	44,771	16,455	17,550						23,534		24,591	25,814	27,160	28,664	30,043	31,622	33,318	35,049	36,734	38,533
D		Voluntary Margin of Over-procurement		-	-	-	-	-	0	0	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
E	C+D	Net RPS Procurement Need (GWh)		14,755	15,119	14,896	44,771	16,455	17,550						23,534		24,591	25,814	27,160	28,664	30,043	31,622	33,318	35,049	36,734	38,533
		RPS-Eligible Procurement																								
Fa		Risk-Adjusted RECs from Online Generation		15,654	15,817	16,535	48,006	17,731	18,214	19,719	55,663	19,293	19,192	18,361	17,499	74,345	16,861	16,769	16,714	16,614	16,544	16,298	14,836	13,489	13,314	12,049
Faa		Forecast Failure Rate for Online Generation (%)		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Fb		Risk-Adjusted RECs from RPS Facilities in Development		-	-	-	-	-	102	1,801	1,904	4,265	5,315	6,430	8,892	24,903	9,057	9,017	8,976	8,956	8,896	8,856	8,816	8,797	8,738	8,699
Fbb		Forecast Failure Rate for RPS Facilities in Development (%)		*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*11.6%*	*11.0%*	*16.8%*	*16.8%*	*19.8%*	*26.0%*	*21.1%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*	*26.4%*
Fc		Pre-Approved Generic RECs		-	-	-	-	-	-	-	-	21	75	291	440	827	573	760	934	941	938	938	938	941	938	938
Fe		Executed REC Sales		362	778	473	1,614	-	-	404	404	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F	Fa+Fb+Fc-Fe	Total RPS Eligible Procurement (GWh) [2]		15,291	15,039	16,062	46,392	17,731	18,316	21,116	57,163	23,579	24,582	25,082	26,831	100,074	26,492	26,546	26,624	26,511	26,377	26,092	24,590	23,226	22,990	21,686
F0		Category 0 RECs [3]		15,239	14,905	15,806	45,949	16,492	15,169	15,558	47,218	14,305	12,923	11,761	10,916	49,905	10,304	10,229	10,224	10,127	10,093	9,905	9,733	9,716	9,562	8,307
F1		Category 1 RECs [3]		52	134	256	443	1,240	3,147	5,558	9,945	9,253	11,584	13,031	15,475	49,342	15,615	15,556	15,465	15,443	15,346	15,249	13,919	12,570	12,490	12,441
F2		Category 2 RECs [3]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3		Category 3 RECs [3]		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Gross RPS Position (Physical Net Short)																								
Ga	F-E	Annual Gross RPS Position (GWh)		536	(80)	1,166	1,622	1,277	766						3,297		1,901	731	(536)	(2,153)	(3,666)	(5,530)	(8,728)	(11,823)	(13,744)	(16,847)
Gb	F/A	Annual Gross RPS Position (%)		20 7%	19 9%	21 6%	20 7%	23 4%	24 3%						37 6%		37 4%	37 5%	37 5%	37 0%	36 6%	35 8%	33 2%	30 9%	30 2%	28 1%
		Application of Bank																								
Ha		Existing Banked RECs above the PQR		0	536	447	0	1,583	2,858	3,591	1,583				16,479		19,729	21,585	22,277	22,277	22,277	22,277	22,277	22,277	22,277	22,277
Hb		RECs above the PQR added to Bank		536	(89)	1,136	1,583	1,275	734						3,251		1,855	693	-	-	-	-	-	-	-	-
Hc		Non-bankable RECs above the PQR		-	9	30	39	2	32						46		46	39	-	-	-	-	-	-	-	-
H	Ha+Hb	Gross Balance of RECs above the PQR		536	447	1,583	1,583	2,858	3,591						19,729		21,585	22,277	22,277	22,277	22,277	22,277	22,277	22,277	22,277	22,277
Ia		Planned Application of RECs above the PQR towards RPS Compliance		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ib		Planned Sales of RECs above the PQR		0	0	0	-	0	0	0	-	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0
J	H-Ia-Ib	Net Balance of RECs above the PQR		536	447	1,583	1,583	2,858	3,591						19,729		21,585	22,277	22,277	22,277	22,277	22,277	22,277	22,277	22,277	22,277
J0		Category 0 RECs [3]		1,140	-	-	1,140	-									-	-	-	-	-	-	-	-	-	-
J1		Category 1 RECs [3]		52	134	256	443	1,240	3,147								1,855	693	-	-	-	-	-	-	-	-
J2		Category 2 RECs [3]		-	-	-	-	-									-	-	-	-	-	-	-	-	-	-
		Expiring Contracts																								
K		RECs from Expiring RPS Contracts								1,010	1,010	1,678	2,100	3,213	4,069	11,059	4,648	4,961	5,059	5,207	5,204	5,409	5,597	5,643	5,750	6,226
		Net RPS Position (Optimized Net Short)																								
La	Ga+Ia-Ib-Hc	Annual Net RPS Position after Bank Optimization (GWh)		536	(89)	1,136	1,583	1,275	734						3,251		1,855	693	(536)	(2,153)	(3,666)	(5,530)	(8,728)	(11,823)	(13,744)	(16,847)
Lb	(Ga+Ia-Ib-Hc)/A	Annual Net RPS Position after Bank Optimization (%)		20 7%	19 9%	21 5%	20 7%	23 4%	24 3%						37 6%		37 4%	37 5%	37 5%	37 0%	36 6%	35 8%	33 2%	30 9%	30 2%	28 1%

Note Fields in grey are potected as Confidential under CPUC Confidentiality Rules

Note Values are shown in GWhs

Notes:

1 Based on SCE's February 2016 bundled retail sales forecast

2 Includes all contracts executed through June 30, 2016; new generation forecast based on individual project specific success rates for large near-term projects and flat average success rate for remaining projects based on these projects' overall weighted average success rate

3 Forecast of deliveries by portfolio content categories is for executed contracts only; does not include program generics

CONFIDENTIAL APPENDIX C.3

Optimized Renewable Net Short Calculations Based On CPUC Assumptions

(REDACTED)

CONFIDENTIAL APPENDIX C.4

Optimized Renewable Net Short Calculations Based On SCE Assumptions

(REDACTED)

PUBLIC APPENDIX D

Cost Quantification Table

Joint IOU Assumption Guidelines for Table Input	
Table 1 (Actual Costs, $) Items	**Actual**
Rows 2 – 8, 11 (2003-2015)	Settlements data from 1/1/2003 to 12/31/2015
Row 9	Annualized capital cost plus applicable O&M in each year
Row 10	LCOE multiplied by actual generation in each year
Row 13	Actual bundled retail sales data reported to the CEC through the annual RPS track forms and the CPUC through the semi-annual RPS compliance report
Row 14	Total Cost / Bundled Retail Sales
Table 2 (Forecast Cost, $) Items	**Forecast**
Rows 2 -11 and 16-25	Forecast begins on 1/1/2016 • UOG Small Hydro is annualized capital cost plus 2015 O&M escalated at 5% annually • UOG Solar is LCOE multiplied by actual generation in each year
Rows 13 and 27	IOU's most current bundled retail sales forecast
Rows 14 and 28	Total Cost / Bundled Retail Sales
Table 3 (Actual Generation, MWh) Items	**Actual**
Rows 2 – 11 (2003-2015)	Settlements data from 1/1/2003 to 12/31/2015
Table 4 (Forecast Generation, MWh) Items	**Forecast**
Rows 2 -11 and 16-25	Forecast begins on 1/1/2016 • Caluclated as forecasted generation in each year

Joint IOU Cost Quantification Table 1 (Actual Costs, $)

		Actual RPS-Eligible Procurement and Generation Costs												
1	**Technology Type**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
2	Biogas	$49,239,752	$55,218,581	$58,024,700	$55,842,748	$46,391,310	$45,669,901	$41,319,957	$46,567,994	$45,003,728	$35,156,543	$33,114,888	$33,398,837	$26,208,060
3	Biomass	$30,229,214	$30,641,340	$29,266,687	$29,364,748	$31,995,803	$32,870,627	$37,676,121	$39,934,586	$32,647,359	$8,227,073	$0	$0	$0
4	Geothermal	$533,787,287	$568,528,010	$569,145,247	$540,276,590	$564,191,771	$682,923,953	$591,094,390	$601,071,879	$559,894,871	$415,307,356	$433,400,967	$488,851,482	$406,326,046
5	Small Hydro	$14,680,635	$13,351,784	$23,129,437	$22,350,522	$11,682,561	$17,217,269	$12,197,656	$19,239,880	$26,057,270	$18,237,083	$10,001,384	$2,467,173	$1,578,731
6	Solar PV	$2,303	$1,077	$574	$111	$0	$0	$116,015	$6,014,872	$6,175,717	$10,245,933	$28,978,316	$201,179,165	$406,503,661
7	Solar Thermal	$109,767,959	$109,176,941	$102,333,401	$100,464,297	$108,126,446	$118,442,549	$118,633,943	$122,739,976	$124,859,719	$101,611,519	$92,137,545	$111,941,669	$114,443,298
8	Wind	$150,501,168	$168,906,414	$164,098,293	$158,644,762	$185,560,185	$211,157,917	$197,306,648	$298,846,815	$443,074,749	$553,158,034	$732,844,641	$733,069,427	$597,228,328
9	UOG Small Hydro	$18,919,069	$20,783,330	$22,004,724	$25,476,773	$28,921,419	$29,624,912	$32,852,293	$35,084,449	$46,523,880	$54,403,396	$53,529,737	$54,486,018	$24,938,059
10	UOG Solar	$0	$0	$0	$0	$0	$237,324	$1,518,688	$2,587,858	$15,703,577	$34,084,657	$24,802,431	$35,339,130	$42,453,790
11	Unbundled RECs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
12	**Total CPUC-Approved RPS-Eligible Procurement and Generation Cost** [Sum of Rows 2 through 11]	**$907,127,388**	**$966,607,475**	**$968,003,063**	**$932,420,551**	**$976,869,495**	**$1,138,144,451**	**$1,032,715,711**	**$1,172,088,308**	**$1,299,940,869**	**$1,230,431,594**	**$1,408,809,909**	**$1,660,732,901**	**$1,619,679,972**
13	Bundled Retail Sales (kWh)	70,616,552,902	72,964,152,898	74,994,454,104	78,863,139,433	79,505,151,004	80,956,160,306	78,048,183,506	75,141,421,957	73,777,490,034	75,596,657,918	74,480,094,902	75,828,582,966	75,322,345,868
14	**Incremental Rate Impact**	**1.28 ¢/kWh**	**1.32 ¢/kWh**	**1.29 ¢/kWh**	**1.18 ¢/kWh**	**1.23 ¢/kWh**	**1.41 ¢/kWh**	**1.32 ¢/kWh**	**1.56 ¢/kWh**	**1.76 ¢/kWh**	**1.63 ¢/kWh**	**1.89 ¢/kWh**	**2.19 ¢/kWh**	**2.15 ¢/kWh**

*The actual cost of UOG Small Hydro in 2013 was $53,529,737, not $53,101,662 as reported in the 2014 RPS Procurement Plan.
*The actual cost of UOG Small Hydro in 2014 was $54,486,018, not $52,517,116 as reported in the 2015 RPS Procurement Plan

Joint IOU Cost Quantification Table 2 (Forecast Costs, $)

		Forecasted Future Expenditures on RPS-Eligible Procurement and Generation Costs							
1	**Executed But Not CPUC-Approved RPS-Eligible Contracts**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
2	Biogas	$0	$0	$0	$0	$0	$0	$0	$0
3	Biomass	$0	$0	$0	$0	$0	$0	$0	$0
4	Geothermal	$0	$0	$29,307,449	$29,981,521	$30,706,772	$31,384,263	$32,103,025	$32,838,922
5	Small Hydro	$0	$0	$0	$0	$0	$0	$0	$0
6	Solar PV	$79,011	$2,492,164	$6,483,988	$7,755,502	$111,796,158	$120,843,364	$122,104,083	$123,258,578
7	Solar Thermal	$0	$7,792,355	$12,132,828	$11,807,020	$11,738,554	$11,718,432	$11,717,986	$11,716,851
8	Wind	$0	$8,873,257	$65,108,945	$83,068,357	$83,272,965	$83,087,487	$83,081,426	$83,077,263
9	UOG Small Hydro	$0	$0	$0	$0	$0	$0	$0	$0
10	UOG Solar	$0	$0	$0	$0	$0	$0	$0	$0
11	Unbundled RECs	$0	$0	$0	$0	$0	$0	$0	$0
12	**Total Executed But Not CPUC-Approved RPS-Eligible Procurement and Generation Cost** [Sum of Rows 2 through 11]	**$79,011**	**$19,157,776**	**$113,033,210**	**$132,612,400**	**$237,514,450**	**$247,033,547**	**$249,006,521**	**$250,891,614**
13	Bundled Retail Sales (kWh)					71,334,776,341	70,781,926,528	70,739,206,106	71,020,010,504
14	**Incremental Rate Impact**					**0.33 ¢/kWh**	**0.35 ¢/kWh**	**0.35 ¢/kWh**	**0.35 ¢/kWh**
15	**CPUC-Approved RPS-Eligible Contracts (Incl. RAM/FIT/PV Contracts)**								
16	Biogas	$18,601,973	$10,323,487	$10,466,351	$10,356,684	$9,471,441	$5,724,327	$5,282,807	$5,295,853
17	Biomass	$0	$0	$0	$0	$0	$0	$29,654,125	$41,582,984
18	Geothermal	$271,322,242	$310,116,010	$314,653,882	$316,658,410	$309,399,106	$312,779,755	$316,416,511	$315,008,194
19	Small Hydro	$5,729,704	$7,029,251	$6,655,679	$7,053,540	$5,559,204	$3,485,864	$3,428,958	$3,299,632
20	Solar PV	$639,917,905	$855,213,377	$860,798,071	$931,168,059	$1,063,038,733	$1,074,155,417	$1,079,168,965	$1,082,434,539
21	Solar Thermal	$62,427,125	$72,327,441	$70,881,235	$68,042,947	$65,583,465	$56,222,487	$54,265,375	$54,134,968
22	Wind	$709,935,360	$765,043,818	$766,065,516	$804,370,462	$802,982,010	$789,093,259	$767,872,725	$767,418,478
23	UOG Small Hydro	$26,568,347	$27,219,614	$27,903,444	$28,621,466	$29,375,389	$30,167,008	$30,998,208	$31,870,968
24	UOG Solar	$49,132,021	$49,132,021	$49,132,021	$49,132,021	$49,132,021	$49,132,021	$49,132,021	$49,132,021
25	Unbundled RECs								$ -
26	**Total CPUC-Approved RPS-Eligible Procurement and Generation Cost** [Sum of Rows 16 through 25]	**$1,783,634,678**	**$2,096,405,019**	**$2,106,556,199**	**$2,215,403,589**	**$2,334,541,369**	**$2,320,760,136**	**$2,336,219,695**	**$2,350,177,637**
27	Bundled Retail Sales (kWh)					71,334,776,340.80	70,781,926,527.90	70,739,206,106.06	71,020,010,503.62
28	**Incremental Rate Impact**					**3.27 ¢/kWh**	**3.28 ¢/kWh**	**3.30 ¢/kWh**	**3.31 ¢/kWh**
29	**Total Incremental Rate Impact** [Row 14 + 28; Rounding can cause Row 29 to differ slightl from the sum of Row 14 and 28]					**3.61 ¢/kWh**	**3.63 ¢/kWh**	**3.65 ¢/kWh**	**3.66 ¢/kWh**

Joint IOU Cost Quantification Table 2 (continued) (Forecast Costs, $)

		Forecasted Future Expenditures on RPS-Eligible Procurement and Generation Costs						
1	**Executed But Not CPUC-Approved RPS-Eligible Contracts**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
2	Biogas	$0	$0	$0	$0	$0	$0	$0
3	Biomass	$0	$0	$0	$0	$0	$0	$0
4	Geothermal	$33,619,955	$34,366,884	$35,165,985	$35,972,095	$0	$0	$0
5	Small Hydro	$0	$0	$0	$0	$0	$0	$0
6	Solar PV	$124,544,558	$125,891,288	$127,609,723	$128,811,872	$130,199,038	$131,314,328	$132,739,913
7	Solar Thermal	$11,732,185	$11,715,408	$11,721,280	$4,767,360	$171,495	$0	$0
8	Wind	$83,241,206	$83,067,324	$83,092,880	$83,087,487	$83,258,436	$83,067,254	$83,060,034
9	UOG Small Hydro	$0	$0	$0	$0	$0	$0	$0
10	UOG Solar	$0	$0	$0	$0	$0	$0	$0
11	Unbundled RECs	$0	$0	$0	$0	$0	$0	$0
12	**Total Executed But Not CPUC-Approved RPS-Eligible Procurement and Generation Cost** [Sum of Rows 2 through 11]	**$253,137,903**	**$255,040,904**	**$257,589,868**	**$252,638,814**	**$213,628,969**	**$214,381,582**	**$215,799,946**
13	Bundled Retail Sales (kWh)	71,671,338,660	72,114,523,665	72,984,467,215	74,049,897,958	75,112,942,713	76,009,290,411	77,072,176,476
14	**Incremental Rate Impact**	**0.35 ¢/kWh**	**0.35 ¢/kWh**	**0.35 ¢/kWh**	**0.34 ¢/kWh**	**0.28 ¢/kWh**	**0.28 ¢/kWh**	**0.28 ¢/kWh**
15	**CPUC-Approved RPS-Eligible Contracts (Incl. RAM/FIT/PV Contracts)**							
16	Biogas	$5,426,509	$5,497,640	$4,560,386	$1,436,233	$354,712	$359,695	$368,317
17	Biomass	$42,483,543	$43,387,968	$44,529,625	$45,390,342	$46,364,546	$47,138,770	$48,147,077
18	Geothermal	$313,907,242	$317,508,981	$311,985,225	$202,962,350	$146,584,446	$146,093,216	$55,075,024
19	Small Hydro	$3,313,822	$3,216,631	$3,227,715	$3,234,790	$3,211,836	$3,136,322	$3,147,505
20	Solar PV	$1,087,060,108	$1,093,533,623	$1,105,043,796	$1,108,624,217	$1,114,427,782	$1,116,844,647	$1,118,167,547
21	Solar Thermal	$54,078,794	$54,142,728	$54,456,613	$54,288,332	$54,218,842	$54,000,518	$53,994,920
22	Wind	$769,855,073	$768,931,242	$768,919,692	$770,246,658	$771,792,367	$760,600,647	$749,938,193
23	UOG Small Hydro	$32,787,366	$33,749,584	$34,759,913	$35,820,758	$36,934,645	$38,104,227	$39,332,288
24	UOG Solar	$49,132,021	$49,132,021	$49,132,021	$49,132,021	$49,132,021	$49,132,021	$49,132,021
25	Unbundled RECs	$0	$0	$0	$0	$0	$0	$0
26	**Total CPUC-Approved RPS-Eligible Procurement and Generation Cost** [Sum of Rows 16 through 25]	**$2,358,044,478**	**$2,369,100,419**	**$2,376,614,986**	**$2,271,135,701**	**$2,223,021,197**	**$2,215,410,063**	**$2,117,302,893**
27	Bundled Retail Sales (kWh)	71,671,338,660	72,114,523,665	72,984,467,215	74,049,897,958	75,112,942,713	76,009,290,411	77,072,176,476
28	**Incremental Rate Impact**	**3.29 ¢/kWh**	**3.29 ¢/kWh**	**3.26 ¢/kWh**	**3.07 ¢/kWh**	**2.96 ¢/kWh**	**2.91 ¢/kWh**	**2.75 ¢/kWh**
29	**Total Incremental Rate Impact** [Row 14 + 28; Rounding can cause Row 29 to differ slightly from the sum of Row 14 and 28]	**3.64 ¢/kWh**	**3.64 ¢/kWh**	**3.61 ¢/kWh**	**3.41 ¢/kWh**	**3.24 ¢/kWh**	**3.20 ¢/kWh**	**3.03 ¢/kWh**

Joint IOU Cost Quantification Table 3 (Actual Generation, kWh)

		Actual RPS-Eligible Procurement and Generation (kWh)												
1	**Technology Type**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
2	Biogas	722,946,872	777,312,732	771,018,454	752,792,686	587,082,098	546,962,524	493,557,888	513,205,916	505,975,841	499,348,085	484,856,973	449,602,910	410,834,725
3	Biomass	365,097,000	373,917,000	351,063,000	353,889,000	365,332,000	363,224,000	417,625,000	437,916,000	351,018,000	114,694,000	0	0	0
4	Geothermal	7,079,544,959	7,882,153,152	7,823,442,082	7,481,228,810	7,611,424,731	7,739,370,197	7,675,040,864	7,633,511,171	7,178,640,942	6,421,878,833	6,536,991,410	6,745,455,452	6,687,895,884
5	Small Hydro	236,744,651	246,952,691	325,458,412	348,497,816	196,112,961	182,554,690	138,319,853	220,027,751	301,899,277	193,824,909	111,406,210	28,180,940	17,607,949
6	Solar PV	0	0	0	0	0	0	1,372,324	51,389,213	53,432,781	73,823,619	247,123,128	1,839,819,140	3,825,676,284
7	Solar Thermal	756,941,166	739,291,464	622,099,854	613,049,994	666,864,846	730,264,176	839,801,580	879,081,877	889,065,595	868,991,935	680,234,418	751,904,813	833,904,840
8	Wind	2,366,582,609	2,313,238,518	2,275,713,067	2,232,844,707	2,374,032,238	2,383,541,034	3,038,798,465	4,142,352,867	5,218,539,121	6,286,303,872	7,511,002,142	7,442,198,003	6,062,686,864
9	UOG Small Hydro	535,123,742	466,007,745	545,840,580	599,902,056	362,302,038	344,846,249	426,458,028	461,590,000	618,139,310	434,380,326	269,814,338	274,950,708	234,845,891
10	UOG Solar	0	0	0	0	0	438,489	2,798,912	4,846,187	54,532,151	98,598,314	68,910,176	98,184,960	117,952,073
11	Unbundled RECs	0	0	0	0	0	0	0	0	0	0	0	0	0
12	**Total CPUC-Approved RPS-Eligible Procurement and Generation** [Sum of Rows 2 through 11]	12,062,980,999	12,798,873,302	12,714,635,449	12,382,205,069	12,163,150,912	12,291,201,359	13,033,772,914	14,343,920,982	15,171,243,018	14,991,843,893	15,910,338,795	17,630,296,926	18,191,404,510

Joint IOU Cost Quantification Table 4 (Forecast Generation, kWh)

		Forecasted Future RPS-Deliveries 2016-2023 (kWh)							
1	**Executed But Not CPUC-Approved RPS-Eligible Contracts**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
2	Biogas	0	0	0	0	0	0	0	0
3	Biomass	0	0	0	0	0	0	0	0
4	Geothermal	0	0	438,000,000	438,000,000	439,200,000	438,000,000	438,000,000	438,000,000
5	Small Hydro	0	0	0	0	0	0	0	0
6	Solar PV	1,431,604	47,327,325	99,751,500	121,508,782	2,203,101,970	2,342,283,665	2,330,019,781	2,317,820,739
7	Solar Thermal	0	120,628,635	188,496,130	183,447,020	182,277,707	181,986,030	181,986,030	181,986,030
8	Wind	0	159,454,604	1,223,561,760	1,570,439,440	1,573,673,904	1,570,278,431	1,570,278,431	1,570,278,431
9	UOG Small Hydro	0	0	0	0	0	0	0	0
10	UOG Solar	0	0	0	0	0	0	0	0
11	Unbundled RECs	0	0	0	0	0	0	0	0
12	**Total Executed But Not CPUC-Approved RPS-Eligible Deliveries** [Sum of Rows 2 through 11]	1,431,604	327,410,564	1,949,809,390	2,313,395,243	4,398,253,580	4,532,548,126	4,520,284,242	4,508,085,200
15	**CPUC-Approved RPS-Eligible Contracts (Incl. RAM/FIT/PV Contracts)**								
16	Biogas	501,164,563	141,413,717	141,413,717	138,331,702	125,257,418	75,903,477	65,076,489	63,929,525
17	Biomass	0	0	0	0	0	0	235,274,333	354,045,667
18	Geothermal	6,106,289,096	6,058,995,611	5,616,346,243	4,715,157,400	4,265,151,787	4,231,512,308	4,231,512,308	4,119,046,824
19	Small Hydro	150,465,856	155,225,102	138,189,176	137,491,788	87,333,543	40,443,534	39,287,573	37,670,316
20	Solar PV	5,939,399,265	8,303,362,050	8,305,397,855	9,441,596,175	11,308,373,997	11,439,966,528	11,374,836,286	11,310,060,899
21	Solar Thermal	903,312,368	841,549,661	776,751,033	659,968,179	553,145,892	370,440,552	335,148,840	335,148,840
22	Wind	7,086,937,725	8,014,022,067	7,968,483,186	8,278,607,603	8,078,923,551	7,781,324,714	7,521,568,730	7,482,831,407
23	UOG Small Hydro	197,500,638	452,496,404	452,521,092	452,516,603	453,363,836	452,528,947	452,522,214	452,496,404
24	UOG Solar	120,100,000	120,080,000	120,100,000	120,150,000	120,150,000	119,820,000	120,100,000	120,410,000
25	Unbundled RECs	0	0	0	0	0	0	0	0
26	**Total CPUC-Approved RPS-Eligible Deliveries** [Sum of Rows 16 through 25]	21,005,169,511	24,087,144,612	23,519,202,302	23,943,819,450	24,991,700,024	24,511,940,059	24,375,326,773	24,275,639,882

Joint IOU Cost Quantification Table 4 (continued) (Forecast Generation, kWh)

		Forecasted Future RPS-Deliveries 2024-2030 (kWh)						
1	**Executed But Not CPUC-Approved RPS-Eligible Contracts**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
2	Biogas	0	0	0	0	0	0	0
3	Biomass	0	0	0	0	0	0	0
4	Geothermal	439,200,000	438,000,000	438,000,000	438,000,000	0	0	0
5	Small Hydro	0	0	0	0	0	0	0
6	Solar PV	2,310,889,526	2,293,615,809	2,281,609,235	2,269,666,136	2,262,881,323	2,245,969,013	2,234,214,319
7	Solar Thermal	182,277,707	181,986,030	181,986,030	74,928,206	2,825,124	0	0
8	Wind	1,573,673,904	1,570,278,431	1,570,278,431	1,570,278,431	1,573,673,904	1,570,278,431	1,570,278,431
9	UOG Small Hydro	0	0	0	0	0	0	0
10	UOG Solar	0	0	0	0	0	0	0
11	Unbundled RECs	0	0	0	0	0	0	0
12	**Total Executed But Not CPUC-Approved RPS-Eligible Deliveries** [Sum of Rows 2 through 11]	4,506,041,136	4,483,880,270	4,471,873,696	4,352,872,772	3,839,380,352	3,816,247,443	3,804,492,750
15	**CPUC-Approved RPS-Eligible Contracts (Incl. RAM/FIT/PV Contracts)**							
16	Biogas	64,102,770	63,922,625	52,204,170	16,953,759	5,862,925	5,841,648	5,841,648
17	Biomass	355,090,286	354,045,667	354,045,667	354,045,667	355,090,286	354,045,667	354,045,667
18	Geothermal	4,018,079,022	4,006,976,308	3,828,026,102	2,522,522,656	1,711,874,546	1,707,122,656	593,870,171
19	Small Hydro	37,772,131	36,542,103	36,423,308	36,423,308	35,995,986	34,855,529	34,855,529
20	Solar PV	11,269,756,321	11,181,934,290	11,118,459,047	11,055,336,863	11,016,028,395	10,930,271,735	10,823,707,510
21	Solar Thermal	335,835,834	335,148,840	335,148,840	335,148,840	335,835,834	335,148,840	335,148,840
22	Wind	7,495,802,898	7,466,688,999	7,437,876,380	7,437,876,380	7,436,553,081	7,297,701,949	7,210,286,049
23	UOG Small Hydro	453,334,660	452,528,947	452,545,779	452,545,779	452,545,779	452,545,779	452,545,779
24	UOG Solar	120,410,000	120,140,000	119,850,000	119,850,000	119,850,000	119,850,000	119,850,000
25	Unbundled RECs	0	0	0	0	0	0	0
26	**Total CPUC-Approved RPS-Eligible Deliveries** [Sum of Rows 16 through 25]	24,150,183,920	24,017,927,778	23,734,579,293	22,330,703,251	21,469,636,830	21,237,383,802	19,930,151,191

PUBLIC APPENDIX E

RECS From Expiring Contracts

Contract ID	Name	Contract Type	Nameplate Capacity (MW)	Expected Annual Generation (GWh)	Contract Expiration Date	Technology	Location	Status	PCC Classification
4036	Three Valleys MWD (Miramar)	SO4	0.520	0.730	7/15/2016	Small Hydro	Claremont, CA	Online	PCC 0
6053	Difwind Farms Limited V	SO4	7.900	14.460	10/14/2016	Wind	Palm Springs, CA	Online	PCC 0
4031	Richard Moss	SO4	0.155	0.460	11/6/2016	Small Hydro	Hammil Valley, CA	Online	PCC 0
6096	Westwind Trust	SO4	22.500	25.240	11/30/2016	Wind	Palm Springs, CA	Online	PCC 0
6037	Tehachapi Power Purchase Contract Trust	SO4	56.000	109.230	12/14/2016	Wind	Mojave, CA	Online	PCC 0
8012	TGP Energy Managment, LLC	SALES	-89.000	-404.000	12/15/2016	Biogas, Geothermal, Wind	Various	Online	PCC 1
6213	BNY Western Trust Company	SO4	5.930	17.770	12/21/2016	Wind	Palm Springs, CA	Online	PCC 0
6234	Oak Creek Energy Systems Inc.	SO4	27.900	72.760	12/30/2016	Wind	Mojave, CA	Online	PCC 0
1090	L.A. Co. Sanitation Dist	NEG	50.000	378.650	12/31/2016	Biogas	Whittier, CA	Online	PCC 0
6462	Energy Development & Construction Corp	QFSC	11.700	33.822	12/31/2016	Wind	North Palm Springs, CA	Online	PCC 1
5017	Luz Solar Partners Ltd. III	SO4	35.000	62.580	1/25/2017	Solar Thermal	Boron, CA	Online	PCC 0
5018	Luz Solar Partners Ltd. IV	SO4	35.000	63.630	1/29/2017	Solar Thermal	Boron, CA	Online	PCC 0
4137	American Energy, Inc. (Fullerton Hydro)	SO2	0.400	0.780	1/31/2017	Small Hydro	La Habra, CA	Online	PCC 0
4035	Three Valleys MWD (Fulton Road)	SO4	0.200	1.050	4/1/2017	Small Hydro	Pomona, CA	Online	PCC 0
6012	On Wind Energy, LLC	NEG	2.400	0.960	4/18/2017	Wind	Mojave, CA	Online	PCC 0
3107	Geysers Power Company, LLC	ERR	225.000	1971.000	5/31/2017	Geothermal	Middletown, CA	Online	PCC 0
6105	Terra-Gen 251 Wind, LLC (Monolith X)	SO4	5.310	9.820	6/9/2017	Wind	Tehachapi, CA	Online	PCC 0
4037	Three Valleys MWD (Williams)	SO4	0.350	1.560	6/20/2017	Small Hydro	La Verne, CA	Online	PCC 0
6106	Terra-Gen 251 Wind, LLC (Monolith XI)	SO4	4.990	8.210	6/29/2017	Wind	Tehachapi, CA	Online	PCC 0
6108	Terra-Gen 251 Wind, LLC (Monolith XIII)	SO4	5.670	7.660	6/29/2017	Wind	Tehachapi, CA	Online	PCC 0
3039	Salton Sea Power Generation Co #1	NEG	10.000	64.480	6/30/2017	Geothermal	Calipatria, CA	Online	PCC 0
6107	Terra-Gen 251 Wind, LLC (Monolith XII)	SO4	6.720	10.150	7/8/2017	Wind	Tehachapi, CA	Online	PCC 0
4029	LA CO Flood Control District	SO4	4.975	16.510	10/16/2017	Small Hydro	Azusa, CA	Online	PCC 0
3104	Ormesa Geothermal I	SO4	63.000	385.760	11/29/2017	Geothermal	Holtville, CA	Online	PCC 0
5019	Luz Solar Partners Ltd. V	SO4	35.000	62.880	12/31/2017	Solar Thermal	Boron, CA	Online	PCC 0
4026	Desert Water Agency (Snow Creek)	SO4	0.300	0.500	2/1/2018	Small Hydro	Palm Springs, CA	Online	PCC 0
3011	Terra-Gen Dixie Valley, LLC	SO4	67.230	490.000	7/4/2018	Geothermal	Fallon, NV	Online	PCC 0
6092	Ridgetop Energy, LLC (II)	SO4	28.000	80.650	9/11/2018	Wind	Mojave, CA	Online	PCC 0
6090	Alta Mesa Pwr Purch Contract Trust	SO4	27.000	62.900	12/30/2018	Wind	White Water, CA	Online	PCC 0
3004	Del Ranch Company (Niland #2)	NEG	42.000	308.980	12/31/2018	Geothermal	Niland, CA	Online	PCC 0
3009	Elmore Company	SO4	42.000	312.900	12/31/2018	Geothermal	Niland, CA	Online	PCC 0
4051	Montecito Water District	SO4	0.130	0.630	1/16/2019	Small Hydro	Santa Barbara, CA	Online	PCC 0
3025	Salton Sea Power Generation Co #3	SO4	49.800	322.580	2/13/2019	Geothermal	Calipatria, CA	Online	PCC 0
5020	Luz Solar Partners Ltd. VI	SO4	35.000	58.980	2/20/2019	Solar Thermal	Boron, CA	Online	PCC 0
5021	Luz Solar Partners Ltd. VII	SO4	35.000	54.730	3/1/2019	Solar Thermal	Boron, CA	Online	PCC 0
3030	Coso Energy Developers	SO4	75.000	373.260	3/12/2019	Geothermal	Little Lake, CA	Online	PCC 0
1225	Riverside County Waste Management Dept.	CREST	1.200	6.570	5/31/2019	Biogas	Moreno Valley, CA	Online	PCC 0
6366	Mogul Energy Partnership I, LLC	QFSC	4.000	11.000	6/23/2019	Wind	Tehachapi, CA	Online	PCC 1
6063	Desert Winds I PPC Trust	SO4	48.000	76.280	10/31/2019	Wind	Mojave, CA	Online	PCC 0
6114	Desert Wind III PPC Trust	SO4	40.500	74.460	10/31/2019	Wind	Mojave, CA	Online	PCC 0
4030	Daniel M. Bates	SO4	0.350	1.170	11/21/2019	Small Hydro	California Hot Springs, CA	Online	PCC 0
3026	CE Leathers Company	SO4	42.000	310.480	12/31/2019	Geothermal	Niland, CA	Online	PCC 0
6103	Victory Garden Phase IV Partner - 6103	SO4	6.975	12.810	1/1/2020	Wind	Tehachapi, CA	Online	PCC 0
1221	Ventura Regional Sanitation District	RSC5	1.570	9.198	2/29/2020	Biogas	Santa Paula, CA	Online	PCC 0
4039	Kaweah River Power Authority	SO4	17.000	54.700	3/15/2020	Small Hydro	Lemon Cove, CA	Online	PCC 0
6102	Victory Garden Phase IV Partner - 6102	SO4	6.975	16.400	3/16/2020	Wind	Tehachapi, CA	Online	PCC 0
3028	Salton Sea Power Generation Co #2	SO4	20.000	108.210	4/4/2020	Geothermal	Calipatria, CA	Online	PCC 0
6104	Victory Garden Phase IV Partner - 6104	SO4	6.975	15.540	4/10/2020	Wind	Tehachapi, CA	Online	PCC 0
6095	Dutch Energy	SO4	8.000	20.550	4/12/2020	Wind	Palm Springs, CA	Online	PCC 0
5050	Luz Solar Partners Ltd. VIII	SO2	80.000	158.880	5/29/2020	Solar Thermal	Hinkley, CA	Online	PCC 0
6113	Desert Winds II Pwr Purch Trst	SO4	75.000	201.900	8/16/2020	Wind	Mojave, CA	Online	PCC 0
1193	WM Energy Solutions Inc El Sobrante	RSC5	3.187	16.513	10/31/2020	Biogas	Corona, CA	Online	PCC 0
1195	WM Energy Solutions Inc Simi Valley	RSC5	2.153	10.906	10/31/2020	Biogas	Simi Valley, CA	Online	PCC 0
4034	Central Hydroelectric Corp.	SO4	11.950	41.210	12/7/2020	Small Hydro	Lake Isabella, CA	Online	PCC 0
6067	Sky River Partnership (Wilderness III)	SO4	20.925	44.130	2/13/2021	Wind	Tehachapi, CA	Online	PCC 0
1077	L.A. Co. Sanitation Dist Spadra	NEG	8.000	42.090	4/3/2021	Biogas	Walnut, CA	Online	PCC 0
5051	Luz Solar Partners Ltd. IX	SO2	80.000	170.040	4/17/2021	Solar Thermal	Hinkley, CA	Online	PCC 0
6066	Sky River Partnership (Wilderness II)	SO4	19.800	43.400	5/30/2021	Wind	Tehachapi, CA	Online	PCC 0
6065	Sky River Partnership (Wilderness I)	SO4	36.775	81.710	7/21/2021	Wind	Tehachapi, CA	Online	PCC 0
6333	Mountain View Power Partners, LLC	ERR	66.600	219.900	9/30/2021	Wind	San Gorgonio Pass, CA	Online	PCC 0
4004	Hi Head Hydro Incorporated	NEG	0.350	1.800	4/30/2022	Small Hydro	Bishop, CA	Online	PCC 0
4208	Lower Tule River Irrigation District	CREST	1.400	0.775	7/31/2022	Small Hydro	Porterville, CA	Online	PCC 1
5510	USDA Forest Service San Dimas Technology	CREST	0.250	0.200	7/31/2022	Solar PV	San Dimas, CA	Online	PCC 1
6456	Edom Hills Project 1, LLC	QFSC	19.550	51.400	10/1/2022	Wind	Palm Springs, CA	Online	PCC 1
1099	Inland Empire Utilities Agency	SO1	0.580	1.140	12/27/2022	Biogas	Chino, CA	Online	PCC 0
3021	Second Imperial Geothermal Co.	NEG	37.000	222.880	7/4/2023	Geothermal	Heber, CA	Online	PCC 0
2804	Orange County Sanitation District	NEG	12.000	0.010	7/26/2023	Biogas	Huntington Beach, CA	Online	PCC 0
6367	Windland Refresh 1, LLC	RAM20	7.455	18.286	6/30/2024	Wind	Mojave, CA	Online	PCC 1
4150	Water Facilities Authority	SO1	0.224	0.050	8/25/2024	Small Hydro	Upland, CA	Online	PCC 0
4222	Goleta Water District	WATER	0.250	1.200	2/18/2025	Small Hydro	Goleta, CA	Online	PCC 1
6355	Coram Energy LLC	RAM20	3.000	10.512	12/31/2025	Wind	Mojave, CA	Online	PCC 1
3050	Salton Sea Power Generation Co #4	NEG	36.000	309.080	5/23/2026	Geothermal	Calipatria, CA	Online	PCC 0