BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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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)

JOINT RESPONSE OF PACIFIC GAS AND ELECTRIC COMPANY (U 39 E), SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E), AND SAN DIEGO GAS & ELECTRIC COMPANY (U 902 E) TO ADMINISTRATIVE LAW JUDGE'S RULING ACCEPTING INTO THE RECORD REVISED ENERGY DIVISION STAFF PAPER ON THE USE OF EFFECTIVE LOAD CARRYING CAPABILITY FOR RENEWABLES PORTFOLIO STANDARD PROCUREMENT AND SETTING SCHEDULE

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Dated: June 17, 2016

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Pursuant to Ordering Paragraph 2 of Administrative Law Judge ("ALJ") Simon's March 9, 2016 Ruling Accepting into the Record Revised Energy Division Staff Paper on the Use of Effective Load Carrying Capability ("ELCC") for Renewables Portfolio Standard ("RPS") Procurement and Setting Schedule (the "Ruling") as modified by the June 6, 2016 Ruling of ALJ Simon, Pacific Gas and Electric Company ("PG&E"), Southern California Edison Company ("SCE"), and San Diego Gas & Electric Company (hereinafter referred to as "Joint IOUs") submit as Attachment 1 to this pleading the Joint IOU proposal on the use of ELCC methodologies for use in RPS procurement (the "Joint Proposal"). By a Ruling filed on June 6, 2016, ALJ Simon extended the time to submit this portion of the Joint Proposal to June 17, 2016. Consistent with ALJ Simon's June 6, 2016 Ruling, the Joint IOUs anticipate filing an update to the Joint Proposal no later than December 15, 2016.

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Respectfully Submitted on behalf of the Joint IOUs,

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By: */s/ M. Grady Mathai-Jackson*
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Dated: June 17, 2016

ATTACHMENT 1:
JOINT IOU PROPOSAL
TO USE EFFECTIVE LOAD CARRYING CAPABILITY METHODOLOGY FOR RPS PROCUREMENT

I. INTRODUCTION

This joint proposal (Joint Proposal) of the three investor-owned utilities (IOUs), Southern California Edison Company (SCE), San Diego Gas and Electric Company (SDG&E), and Pacific Gas and Electric Company (PG&E) (collectively, the Joint IOUs), responds to the Administrative Law Judge's Ruling of March 9, 2016 (March 9 Ruling), as modified by the Administrative Law Judge's Ruling Granting in Part and Denying in Part Joint Motion for Extension of Time to File Effective Load Carrying Capability Proposal for Renewables Portfolio Standard (RPS) Procurement, dated June 6, 2016 (June 6 Ruling). This Joint Proposal recommends an Effective Load Carrying Capability (ELCC) methodology for procurement to meet RPS requirements.

The March 9 Ruling, as modified by the June 6 Ruling, directed the Joint IOUs to submit a proposal on using ELCC values in the RPS procurement process, including at least the following elements:

a. A common methodology to calculate ELCC values, following the guidelines in section 5 of the Revised Staff Paper[1];

b. Standardized model inputs and assumptions for calculating ELCC, following the guidelines in section 6 of the Revised Staff Paper;

c. Draft ELCC values for multiple years, following the format in section 4.2 of the Revised Staff Paper;

d. A benchmarking report that compares and contrasts the IOUs' respective ELCC values and the RPS Calculator and Resource Adequacy (RA) ELCC values, following the guidelines in section 7 of the Revised Staff Paper;

[1] The "Revised Staff Paper" refers to the "Revised Energy Division Staff Paper on Criteria for Effective Load Carrying Capability in Least-Cost Best-Fit Analysis for RPS Procurement," filed in R.15-02-020 as Attachment A to the March 9 Ruling.

e. A plan for benchmarking and updating ELCC values every two years;

f. Any other elements necessary to provide a complete proposal on ELCC for RPS procurement purposes.

II. JOINT PROPOSAL

The Joint Proposal presented below covers certain topics outlined in the March 9 Ruling and further described in the Revised Staff Paper. Consistent with the June 6 Ruling, the Joint IOUs will file an update to this Joint Proposal no later than December 15, 2016, providing actual draft ELCC values and a comparison of those values to the RPS Calculator and RA ELCC values.

A. Common inputs and assumptions

1. Data inputs

The IOUs propose to use the Default Scenario with Mid Additional Achievable Energy Efficiency (AAEE) from the May 17, 2016, Assigned Commissioner's Ruling adopting standardized assumptions and scenarios for use in the 2016 Long-Term Procurement Planning (LTPP) and Integrated Resources Planning (IRP) (May 17 ACR) as the basis for inputs to the ELCC analysis.[2] At a high level, the Default Scenario with Mid AAEE is a sensitivity to the 2016 LTPP adopted Default Scenario with lower energy efficiency based on the CEC's 2015 Mid AAEE level, and therefore with higher loads and RPS generation. Given that there are alternatives to achieve the desired 40% greenhouse emission reduction goal by 2030, including energy efficiency and RPS, it is appropriate to use the Mid AAEE level to estimate the ELCCs before the integrated resource plans are developed in the 2016 LTPP/IRP proceeding.

Modeling of wind and solar generation based on region, weather, and technology type will be based on historical and forecasted data, and other data sources, provided by the California

[2] Assigned Commissioner's Ruling Adopting Assumptions And Scenarios For Use In The California Independent System Operator's 2016-17 Transmission Planning Process And Future Commission Proceedings, filed in R.13-012-010 on May 17, 2016, Attachment 1, pp. 54 (describing the Default Scenario with Mid AEEE).

Independent System Operator (CAISO) for the 2016 LTPP need analysis and provided by the Western Electricity Coordinating Council (WECC) as part of its Transmission Expansion Planning Policy Committee (TEPPC) 2026 Common Case. All inputs from the CAISO and WECC are for the 2026 operating year.

As required by the Revised Staff Paper, the Joint Proposal provides a list of key input assumptions in the table below. Unless noted, the assumptions come from inputs that the Commission adopted for the 2016 LTPP Default Scenario with Mid AAEE.[3] For these inputs, the table below simply refers to the "2016 LTPP assumption." In some cases, Energy Division, the CAISO, and others are going to develop the actual numerical values for these assumptions, such as: energy profiles for wind and solar resources used in the Default Scenario; conventional resource inputs that come from the Energy Division's Scenario Tool; the CAISO Master Generation Capacity File; and the WECC TEPPC 2026 Common Case. As a result, the IOUs would update and supplement this list of assumptions as needed when the IOUs submit the actual ELCC values in December 2016.

Table 1 – List of Input Assumptions

Input	Assumption
a. Outage rates of system resources	2016 LTPP assumption
b. Resource inputs and use limitations	2016 LTPP assumption
c. Contribution of hydro resources toward meeting system loads	2016 LTPP assumption
d. ELCC values at the appropriate level - system, local, service territory, or any other level	ELCC values for wind and solar calculated with SERVM; additional comparison data will be calculated using the simplified analysis tool described below
e. Planned resource additions and resource retirement	2016 LTPP assumption

[3] Attachment 1 to May 17 ACR, p. 54.

Input	Assumption
f. Contribution of imports toward meeting system loads	2016 LTPP assumption
g. Accounting for all prior procurement	2016 LTPP assumption
h. Data sources for weather and weather region definitions	Temperature data from NOAA (NNDC Climate Data); Weather region from Energy Division's ELCC modeling for RA proceeding
i. Data sources for historical and projected load, including load shapes	2016 LTPP assumption
j. Technology and geographic combinations of resources	2016 LTPP assumption
k. Operating/production costs for system resources	2016 LTPP assumption
l. Treatment of flexibility	Loss of load due to flexibility shortages are counted towards loss of load events, as directed by expected Commission decision directing modeling methodologies and approaches[4]
m. Natural gas price forecast	2016 LTPP assumption
n. Variable generation data for calculations of capacity value	2016 LTPP assumption
o. Renewable penetration levels and related scenarios	2016 LTPP assumption
p. Common years to calculate ELCC values	2026
q. Assumptions for years 11-20	2016 LTPP assumption
r. Hourly profiles for different weather years for load, wind/solar generation.	Developed by CEC for load, and Energy Division and CAISO for wind/solar profiles, for the 2016 LTPP

[4] *See* Joint Scoping Memo and Ruling of Assigned Commissioner and Administrative Law Judge, filed May 26, 2016, in R.16-02-007 (May 26 Ruling), pp. 13-14 (stating Commission intention to issue a decision in June/July 2016 directing modeling methodologies and approaches).

Input	Assumption
s. Intra-hour and 5-minute forecast errors for load, wind/solar generation.	Developed from CAISO 2014 1-minute load, wind, solar historical profiles

B. ELCC Methodology

1. Marginal ELCC Calculation

The IOUs propose to calculate the marginal ELCC for least-cost, best-fit (LCBF) RPS bid evaluation for 1000 MW increments for each technology and location combination identified in the following table below. The marginal ELCC will be calculated by adding the increment of each technology to the renewable portfolio in the Default Scenario with Mid AAEE after calibrating the Default Scenario with Mid AAEE to a load/resource balance point, when the loss of load expectation (LOLE) metric for the scenario equals 1.0. This calibration will be done by adding or subtracting conventional fossil generation in proportion to the peak demand in each IOU service area.

Table 2: Location-Technology Combinations for Marginal ELCC

Location → ↓Technology	Northern Cal	Southern Cal	Northwest	Southwest
Wind	✓	✓	✓	✓
Tracking PV	✓	✓		✓
Fixed Axis PV	✓	✓		✓
Distributed PV	✓	✓		

2. Average ELCC Calculation

The IOUs also propose to calculate the average ELCC for wind and solar for the entire CAISO (instead of separate estimates at each location) in the Default Scenario with Mid AAEE. For this calculation, the entire CAISO wind and solar portfolio will be removed to calculate aggregate ELCCs. Each technology (wind or solar) will be removed both individually and together to estimate proportional contribution to ELCC. The average ELCCs will be useful to

compare with the ELCC currently being prepared by the Energy Division in the RA proceeding for use in the 2018 compliance year.

3. Models

The IOUs will use the Strategic Energy and Risk Valuation Model (SERVM) to estimate both marginal and average ELCCs. The same methodology can be used to calculate ELCC with other similar commercially available models. In addition, the IOUs will develop and provide a simplified comparison analysis tool that utilizes a spreadsheet engine to provide additional data for comparison. This simplified spreadsheet tool is further discussed in Section III.

4. Key reliability definitions

The key definitions of desired reliability level and loss of load events will reflect the Commission's planned decision in the 2016 LTPP/IRP proceeding that is expected to provide direction on this issue in June or July of 2016.[5] In the event this decision is not available at the end of July 2016, the IOUs will define loss of load event as any hour in which there is not sufficient capacity to maintain regulation-up reserves plus a minimum 3% of load contingency reserves.

5. Monthly ELCCs

For purposes of RPS procurement, the IOUs propose to allocate the annual capacity value (annual ELCC of a resource times annual $/kW-year capacity cost) based on the relative monthly contribution to the total loss of load events due to a resource, or alternatively unserved load, in the calibrated portfolio after the incremental wind or solar resource has been added to the portfolio. For example, assume the marginal ELCC for wind is 12% of installed capacity and the annual capacity value is $100/kW-year. If 30% of the LOLE avoided by wind occurs in July, the capacity value for the month of July would be $3.6/kW (ie, 12% times $100/kW-year times 30%).

[5] May 26 Ruling, pp 13-14.

6. Multiple Years

The Revised Staff Report asks for marginal ELCCs to be calculated for multiple years.[6] The IOUs propose to calculate the marginal ELCC for year 2026 with 43.3% RPS, consistent with the Default Scenario with Mid AAEE, and with 33% RPS using the same set of other load and resource assumptions. The 33% RPS will be associated with currently contracted resources used through 2025, and the 43.3% RPS with 2026 or later years.

C. Benchmarking

The Ruling requires the Joint Proposal to include a benchmarking report that compares and contrasts the IOUs' respective ELCC values and the more recent RPS Calculator and RA ELCC values.[7] The IOUs propose to list the ELCC values produced by the different models and the known differences in the models, methodologies, assumptions used by the models to produce these ELCC values. The IOUs will present the benchmarking results when they submit the actual ELCC values in December 2016, consistent with the June 6 Ruling extending time to submit those actual ELCC values.

D. Frequency of Updating ELCC-LCBF Values

Consistent with the Revised Staff Paper,[8] the IOUs propose that the update of the ELCC for LCBF be done every two years when new public sets of inputs are available in the LTPP/IRP proceeding.

III. Simplified Companion Analysis Tool

The Joint IOUs propose to develop a simplified companion analysis tool to the SERVM or other commercial product analysis. This tool will be based on the Net Load Peak-Effective Load Carry Capacity (NLP-ELCC) tool that SCE presented at a workshop in the RA proceeding. The NLP-ELCC tool calculates an NPC-ELCC value of a resource based on how well that resource can reduce the *net load peak* instead of the frequency of LOLEs. This NLP-ELCC

[6] Revised Staff Paper, p. 8-9.
[7] Ruling, p. 3; Revised Staff Paper, p. 11.
[8] Revised Staff Paper, p. 11.

analysis only requires load data and production data for resources or technologies that need an ELCC value and can be calculated on a monthly granularity.

Given the same input datasets, the NLP-ELCC tool will produce monthly and annual NPC-ELCC results that can be compared to the SERVM model's ELCC results. Additionally, the NLP-ELCC tool will be publicly available at the time of filing.

VERIFICATION

I, Antonio Alvarez, am an employee of Pacific Gas and Electric Company, a corporation, and am authorized to make this verification on its behalf. I have read the foregoing *JOINT RESPONSE OF PACIFIC GAS AND ELECTRIC COMPANY (U 39 E), SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E), AND SAN DIEGO GAS & ELECTRIC COMPANY (U 902 E) TO ADMINISTRATIVE LAW JUDGE'S RULING ACCEPTING INTO THE RECORD REVISED ENERGY DIVISION STAFF PAPER ON THE USE OF EFFECTIVE LOAD CARRYING CAPABILITY FOR RENEWABLES PORTFOLIO STANDARD PROCUREMENT AND SETTING SCHEDULE, dated June 17, 2016.*

The statements in the foregoing document are true to my own knowledge, except as to matters which are therein stated on information and belief, and as to those matters I believe them to be true. I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 17th day of June, 2016 at San Francisco, California.

/s/ Antonio Alvarez

ANTONIO ALVAREZ
Manager, Renewable Integration
Pacific Gas and Electric Company