PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco CA 94102-3298

Pacific Gas & Electric Company
ELC (Corp ID 39)
Status of Advice Letter 4255G/5839E
As of November 30, 2020

Subject: Large Thermal Energy Storage (L-TES) Incentive Calculation Methodology Proposal for the Self-Generation Incentive Program and Proposed Updates to the Self-Generation Incentive Program (SGIP) Handbook

Division Assigned: Energy

Date Filed: 06-02-2020

Date to Calendar: 06-05-2020

Authorizing Documents: D1908001

Disposition:	**Rejected**
Effective Date:	**None**

Resolution Required: Yes

Resolution Number: E-5106

Commission Meeting Date: None

CPUC Contact Information:

edtariffunit@cpuc.ca.gov

AL Certificate Contact Information:

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STATE OF CALIFORNIA **GAVIN NEWSOM,** *Governor*

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco CA 94102-3298

To: Energy Company Filing Advice Letter

From: Energy Division PAL Coordinator

Subject: Your Advice Letter Filing

The Energy Division of the California Public Utilities Commission has processed your recent Advice Letter (AL) filing and is returning an AL status certificate for your records.

The AL status certificate indicates:

Advice Letter Number
Name of Filer
CPUC Corporate ID number of Filer
Subject of Filing
Date Filed
Disposition of Filing (Accepted, Rejected, Withdrawn, etc.)
Effective Date of Filing
Other Miscellaneous Information (e.g., Resolution, if applicable, etc.)

The Energy Division has made no changes to your copy of the Advice Letter Filing; please review your Advice Letter Filing with the information contained in the AL status certificate, and update your Advice Letter and tariff records accordingly.

All inquiries to the California Public Utilities Commission on the status of your Advice Letter Filing will be answered by Energy Division staff based on the information contained in the Energy Division's PAL database from which the AL status certificate is generated. If you have any questions on this matter please contact the:

Energy Division's Tariff Unit by e-mail to
edtariffunit@cpuc.ca.gov

Ronald van der Leeden
Director
Regulatory Affairs

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June 2, 2020

Advice No. 5640
(Southern California Gas Company – U 904 G)

Advice 4255-G/5839-E
(Pacific Gas and Electric Company – U 39 M)

Advice 4223-E
(Southern California Edison Company – U 338 E)

Advice 112-E
(Center for Sustainable Energy®)

Public Utilities Commission of the State of California

Subject: Large Thermal Energy Storage (L-TES) Incentive Calculation Methodology Proposal for the Self-Generation Incentive Program and Proposed Updates to the Self-Generation Incentive Program (SGIP) Handbook

Purpose

Southern California Gas Company (SoCalGas), Pacific Gas & Electric Company (PG&E), Southern California Edison Company (SCE), and Center for Sustainable Energy® (CSE) (collectively SGIP Program Administrators or PAs) hereby jointly submit to the California Public Utilities Commission (CPUC or Commission) this Advice Letter (AL) to propose a L-TES incentive calculation methodology for SGIP and proposed updates to the SGIP Handbook (Handbook) to incorporate the proposed methodology in accordance with Energy Division's Non-Standard Disposition Letter for SCE AL 4118-E-A/-B, PG&E AL 4186-G-A-B/5701-E-A/-B, SoCalGas AL 5551-G-A/-B, CSE AL 104-E-A/-B (collectively, the Joint PAs' AL) in reference to Decision (D.) 19-08-001,[1] Ordering Paragraph (OP) 2.

[1] D.19-08-001, *Decision Approving Greenhouse Gas Emission Reduction Requirements for the Self-Generation Incentive Program Storage Budget*.

Background

Trane US, Inc. (Trane) submitted an SGIP Program Modification Request (PMR) pertaining to the rating criteria for L-TES projects on December 8, 2017. In the PMR, Trane proposed to use a methodology developed by University of California (UC) Davis' Western Cooling Efficiency Center to calculate the 1-in-10-year peak kilowatt (kW) power consumption of a building's chillers for the sizing of the L-TES system. This methodology was outlined in a project report entitled "Valuation of Thermal Energy Storage Systems for Utility Grid Operators." In addition to this methodology, the Trane PMR proposed to add the following steps to comply with the SGIP requirements pertaining to rating criteria for energy storage systems:

1. Calculate 1-in-10 peak kW (using the UC Davis methodology).
2. Model system kilowatt hour (kWh) as in the CPUC's former Permanent Load Shifting program.
3. Use site pre-monitoring to calibrate the model.
4. Use the calibrated 8760 model to populate a number of 1-hour bins.
5. Interpolate between the end of the bin database and the 1-in-10 peak kW-based UC Davis methodology.
6. "Smooth out" the number of hours in the bins to account for noise in the TMY3 file.
7. Set up the post installation data to be continuously collected.
8. Use the incoming measured system on/off data to replace the data set initially populated by the model and to update the baseline database on a monthly basis thereafter.
9. Report the differential between actual performance during discharge and baseline monthly for the Performance Based Incentive (PBI) payment period for both kWh and greenhouse gas (GHG) emissions reductions.

After thorough review of the methodology proposed by Trane, the SGIP PAs were unable to support the PMR due to its complexity, use of existing equipment specifications rather than replacement equipment specifications to calculate the initial incentive (which may be poorly performing resulting in a higher incentive), unreasonable administrative burden, and use of proprietary simulation models. However, in response to the request, the SGIP Technical Working Group (TWG) developed a methodology based on the California Energy Commission's (CEC) Non-Residential Alternative Calculation Method Reference Manual to calculate the kW and kWh offsets for L-TES technology. Similar to Trane's proposal, the TWG used the 1-in-10-year peak weather conditions to calculate the kW offset. The TWG methodology is outlined herein.

Subsequently, on August 1, 2019, D.19-08-001, *Decision Approving Greenhouse Gas Emission Reduction Requirements for the Self Generation Incentive Program Storage Budget,* was approved and incorporated new operational, verification, and enforcement requirements to ensure compliance of SGIP energy storage systems' reduction of GHG emissions.

Pursuant to D.19-08-001, the PAs and Energy Division Staff agreed to convene a Thermal Energy Storage Working Group, which met on September 13, 2019 to discuss the new GHG rules and their applicability to thermal energy storage technologies.

On November 27, 2019, the PAs jointly submitted an AL pursuant to OP 2 in D.19-08-001,[2] proposing revisions to the Handbook to incorporate new GHG rules to ensure SGIP storage systems reduce GHG emissions.

On December 17, 2019, Trane and DN Tanks submitted their Protest to the Joint PAs' AL, stating the revisions proposed to the Handbook were not in compliance with the requirement set forth in Section 9 of D.19-08-001 because no specific revisions were made to the incentive methodology, and no modifications were made to the GHG requirements for L-TES in the Handbook.[3] CESA's Response to the Joint PAs' AL echoed this concern.[4] Trane, DN Tanks, and CESA requested this modification to L-TES be addressed in a supplemental AL to the Joint PAs' AL.

On December 24, 2019, the PAs submitted a Reply to Trane and DN Tanks' Protest and CESA's Response. The PAs disagreed that the Handbook was not in compliance with the requirement of Section 9 in D.19-08-001.[5] The Decision's Section 9 directed the PAs to recommend minor modifications to the SGIP system, operation, measurement, verification, and performance evaluation requirements to accommodate thermal energy storage (TES) systems' conformance with the GHG rules, as needed. The PAs asserted that the current GHG requirements do not prohibit the participation of L-TES in SGIP, and thus, no specific modifications needed to be made to the proposed GHG requirements; rather, a proposed methodology for calculating the kW/kWh offset for L-TES systems would be more appropriately addressed in a separate AL.

A Non-Standard Disposition Letter approving the Joint PAs' AL was issued on February 24, 2020 by Energy Division and additionally recommended the PAs submit a joint AL to propose a methodology for the L-TES incentive calculation.

Proposed Methodology for L-TES

The PAs propose to use the methodology in the CEC 2019 Nonresidential Alternative Calculation Method Reference Manual (CEC-400-2019-006-CMF) to calculate the kW and kWh offsets for L-TES technology. This methodology uses chiller curves approved by the CEC and used in the California Building Energy Compliance (CBEC) software for Title 24 compliance.

The following parameters would be measured to allow the calculation of the Chiller kW/kWh Offset:

- Chilled water supply temperature
- Chilled water return temperature
- Chilled water supply flowrate
- Condenser water supply temperature
- Condenser water return temperature

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[2] SCE AL 4118-E, AL 4186-G/5701-E, SoCalGas AL 5551-G, and CSE AL 104, *Revisions and Updates to the Self-Generation Incentive Program Handbook Incorporating Program Changes Related to Greenhouse Gas Emissions Reduction Requirements pursuant to Decision 19-08-001.*

[3] Trane and DN Tanks Protest at 2.

[4] CESA Response at 5.

[5] Joint PAs Reply at 5-6.

- Outside air-dry bulb temperature
- Outside air wet bulb
- Delta T across the L-TES
- Flow through the L-TES

The measured inputs will be entered into a macro-enabled Microsoft Excel worksheet along with other inputs, such as:

- Type of chiller
- Rated Capacity of chiller at AHRI conditions (tons)
- Rated Input Power of chiller at AHRI conditions (kW)
- Rated Capacity of Cooling Tower at CTI conditions (tons)
- Rated Input Power of CT Fans at CTI conditions (kW)

The macro-enabled Microsoft Excel worksheet will calculate:

- Available Cooling Capacity of Chiller
- Chiller Part Load Ratio
- Operating Power Draw of Chiller
- Tower Range
- Tower Approach
- Ratio of Available Tower Capacity to Rated Capacity
- Present Load on Cooling Tower
- Cooling Tower Part Load Ratio
- Operating Power Draw of Cooling Tower Fans
- Total Operating Power

To calculate the overall incentive, the total operating power (kW offset) will be calculated at 1-in-10-year peak temperature conditions, assuming the chiller will be operating under full load at those conditions. To calculate the kWh offset, the kW offset will be multiplied by the duration of discharge of the L-TES.

For the calculation of the PBI incentive, the measured inputs will be recorded and entered into the macro-enabled worksheet on a 15-minute interval basis. The kW offset will be calculated every 15 minutes and reported as part of the PBI calculation.

The advantages of this methodology are that it: 1) follows a CEC-approved methodology; 2) adapts easily to different types of L-TES systems, including ice-on-coil and stratified chilled water systems; 3) is consistent across projects (i.e., chiller curves are not derived on a project by project basis); 4) does not allow over-estimation of the SGIP incentive based on the chiller curves for poorly performing existing equipment; 5) is similar to the methodology currently being used in the SGIP for Small Thermal Energy Storage (S-TES); and 6) the one-time development of streamlined calculation spreadsheets for the upfront and PBI portions of the incentive minimizes administrative burden and costs associated with technical review of these projects.

Proposed Amendments to the SGIP Handbook

The proposed amendments to the SGIP Handbook are shown in Attachment A with changes marked in purple and are also summarized below.

Affected Handbook Sections:

- Section 5.1 Rating Criteria for Energy Storage Projects
  - 5.1.1 Rated Capacity (W)
    The rated capacity (W) for energy storage technologies is calculated as follows:

    Large TES (L-TES): Calculated using the L-TES kW/kWh Offset Worksheet and is based on the following parameters of the chiller system(s) with which the Large TES system will be integrated: type of chiller; rated capacity of the chiller at AHRI conditions (tons); rated input power of the chiller at AHRI conditions (kW-AC); rated capacity of the cooling tower at CTI conditions (tons); rated input power of the cooling tower fans at CTI conditions (kW-AC); chilled water supply temperature set point (Degrees F); chilled water return temperature (Degrees F); chilled water supply flowrate (GPM); condenser water supply temperature setpoint and condenser water return temperature (for water cooled systems) (Degrees F); outside air dry bulb temperature and outside air wet bulb temperature (during 1-in-10-year peak temperature conditions) (Degrees F); and estimated load on the chiller during 1-in-10-year peak temperature conditions (Percent).

  - 5.1.2 Energy Capacity (Wh)
    The energy capacity (Wh) for energy storage technologies is calculated as follows:

    Large TES: The rated power (W-AC) of the involved chilled water or ice producing equipment multiplied by the avoided full load-hours which is equal to the single discharge duration of the thermal energy storage system, in hours.

- Section 5.2 Eligibility Requirements for Energy Storage Projects
  - 5.2.4 System Size Parameters
    Large TES systems must be sized no larger than the tonnage of their accompanying chiller system(s).

- Section 5.4 Application Documentation Requirements for Energy Storage Projects
  - 5.4.1 Required Documentation for Reservation Request
    The “Equipment Specifications” description under this section is revised. Energy storage applications must provide a copy of the following:

    3. Equipment Specifications (All Projects not currently Listed on the SGIP Energy Storage Equipment List)

    Large TES systems must provide TES system equipment specifications, chiller system equipment specifications, cooling tower equipment specifications (if applicable), the L-TES kW/kWh-AC Offset Worksheet, and backup documentation of any site-specific conditions, if relevant.

- Section 5.5 Metering & Monitoring Requirements for Energy Storage Projects

  Large TES systems must report the power (kW-AC offset) and energy (kWh-AC offset) that would have been consumed by the chiller system(s) to provide the same amount of cooling provided by the L-TES system by monitoring the operating parameters of the chiller system(s), cooling load on the chiller system(s), and when the L-TES system turns off the involved chiller system(s). The operating parameters to be monitored include chilled water supply temperature set point (Degrees F), chilled water return temperature (Degrees F), chilled water supply flowrate (GPM), condenser water supply temperature setpoint and condenser water return temperature (for water cooled systems) (Degrees F), outside air dry bulb temperature and outside air wet bulb temperature (Degrees F), temperature differential across the L-TES (Degrees F), and flowrate through the L-TES (GPM).

Conclusion

On behalf of the SGIP PAs, SoCalGas respectfully requests the Commission approve the proposed changes to the SGIP Handbook to incorporate a proposed incentive calculation methodology for L-TES in SGIP.

Protests

Anyone may protest this AL to the Commission. The protest must state the grounds upon which it is based, including such items as financial and service impact, and should be submitted expeditiously. The protest must be made in writing and must be received within 20 days of the date of this AL, which is June 22, 2020. The address for mailing or delivering a protest to the Commission is given below.

CPUC Energy Division
Attention: Tariff Unit
505 Van Ness Avenue
San Francisco, CA 94102

A copy of the protest should also be sent via e-mail to the attention of the Energy Division Tariff Unit (EDTariffUnit@cpuc.ca.gov). Due to the COVID-19 pandemic and the shelter at home orders, SoCalGas is currently unable to receive protests or comments to this AL via U.S. mail or fax. Please submit protests or comments to this AL via e-mail to the addresses shown below on the same date they are mailed or e-mailed to the Commission.

For SoCalGas: Attn: Ray B. Ortiz
Tariff Manager - GT14D6
555 West Fifth Street
Los Angeles, CA 90013-1011
Facsimile No.: (213) 244-4957
E-mail: ROrtiz@socalgas.com

For PG&E: Erik Jacobson
Director - Regulatory Relations
c/o Megan Lawson
Pacific Gas and Electric Company
77 Beale Street, Mail Code B13U
P.O. Box 770000
San Francisco, CA 94177
Facsimile No.: (415) 973-3582
E-mail: PGETarrifs@pge.com

For SCE: Gary A. Stern, Ph.D.
Managing Director – Statewide Regulatory Operations
Southern California Edison Company
8631 Rush Street
Rosemead, CA 91770
Telephone No.: (626) 302-9645
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And

Laura Genao
Managing Director, State Regulatory Affairs
c/o Karyn Gansecki
Southern California Edison Company
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Facsimile No.: (415) 929-5544
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For CSE: Sephra Ninow
Director, Regulatory Affairs
Center for Sustainable Energy®
3980 Sherman Street, Suite 170
San Diego, CA 92110
E-mail: sephra.ninow@energycenter.org

Effective Date

SoCalGas believes that this submittal is subject to Energy Division disposition and should be classified as Tier 2 (effective after staff approval) pursuant to General Order (GO) 96-B. Therefore, SoCalGas respectfully requests that this submittal become effective on July 2, 2020, which is 30 days from the date submitted.

Notice

A copy of this AL is being sent to SoCalGas' GO 96-B service list and the Commission's service list in R.12-11-005. Address change requests to the GO 96-B service list should be directed via e-mail to tariffs@socalgas.com or call 213-244-2837. For changes to all other service lists, please contact the Commission's Process Office at 415-703-2021 or via e-mail at process_office@cpuc.ca.gov.

/s/ Ronald van der Leeden
Ronald van der Leeden
Director - Regulatory Affairs

California Public Utilities Commission

ADVICE LETTER SUMMARY

ENERGY UTILITY

MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No.: Southern California Gas Company (U 904G)

Utility type:
☑ ELC ☑ GAS ☐ WATER
☐ PLC ☐ HEAT

Contact Person: Ray B. Ortiz
Phone #: (213) 244-3837
E-mail: ROrtiz@socalgas.com
E-mail Disposition Notice to: Tariffs@socalgas.com

EXPLANATION OF UTILITY TYPE
ELC = Electric GAS = Gas WATER = Water
PLC = Pipeline HEAT = Heat

(Date Submitted / Received Stamp by CPUC)

Advice Letter (AL) #: 5640, et al.

Tier Designation: 2

Subject of AL: Large Thermal Energy Storage (L-TES) Incentive Calculation Methodology Proposal for the Self-Generation Incentive Program and Proposed Updates to the Self-Generation Incentive Program (SGIP) Handbook

Keywords (choose from CPUC listing): Self-Generation, Storage

AL Type: ☐ Monthly ☐ Quarterly ☐ Annual ☑ One-Time ☐ Other:

If AL submitted in compliance with a Commission order, indicate relevant Decision/Resolution #: Decision 19-08-001

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: No

Summarize differences between the AL and the prior withdrawn or rejected AL: N/A

Confidential treatment requested? ☐ Yes ☑ No

If yes, specification of confidential information:
Confidential information will be made available to appropriate parties who execute a nondisclosure agreement. Name and contact information to request nondisclosure agreement/ access to confidential information:

Resolution required? ☐ Yes ☑ No

Requested effective date: 7/2/20

No. of tariff sheets: 0

Estimated system annual revenue effect (%): N/A

Estimated system average rate effect (%): N/A

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected: None

Service affected and changes proposed[1]: N/A

Pending advice letters that revise the same tariff sheets: N/A

[1]Discuss in AL if more space is needed.

Clear Form

Protests and all other correspondence regarding this AL are due no later than 20 days after the date of this submittal, unless otherwise authorized by the Commission, and shall be sent to:

CPUC, Energy Division
Attention: Tariff Unit
505 Van Ness Avenue
San Francisco, CA 94102
Email: EDTariffUnit@cpuc.ca.gov

Name: Ray B. Ortiz
Title: Regulatory Tariff Manager
Utility Name: Southern California Gas Company
Address: 555 West Fifth Street, GT14D6
City: Los Angeles
State: California Zip: 90013-1011
Telephone (xxx) xxx-xxxx: (213) 244-3837
Facsimile (xxx) xxx-xxxx: (213) 244-4957
Email: ROrtiz@socalgas.com

Name: SoCalGas Tariffs
Title:
Utility Name: Southern California Gas Company
Address: 555 West Fifth Street, GT14D6
City: Los Angeles
State: California Zip: 90013-1011
Telephone (xxx) xxx-xxxx: (213) 244-2837
Facsimile (xxx) xxx-xxxx: (213)244-4957
Email: Tariffs@socalgas.com

Clear Form

PG&E Gas and Electric
Advice Submittal List
General Order 96-B, Section IV

AT&T
Albion Power Company
Alcantar & Kahl LLP

Alta Power Group, LLC
Anderson & Poole

Atlas ReFuel
BART

Barkovich & Yap, Inc.
California Cotton Ginners & Growers Assn
California Energy Commission
California Public Utilities Commission
California State Association of Counties
Calpine

Cameron-Daniel, P.C.
Casner, Steve
Cenergy Power
Center for Biological Diversity

Chevron Pipeline and Power
City of Palo Alto

City of San Jose
Clean Power Research
Coast Economic Consulting
Commercial Energy
Crossborder Energy
Crown Road Energy, LLC
Davis Wright Tremaine LLP
Day Carter Murphy

Dept of General Services
Don Pickett & Associates, Inc.
Douglass & Liddell

Downey & Brand
East Bay Community Energy
Ellison Schneider & Harris LLP
Energy Management Service
Engineers and Scientists of California

GenOn Energy, Inc.
Goodin, MacBride, Squeri, Schlotz & Ritchie
Green Power Institute
Hanna & Morton
ICF
IGS Energy
International Power Technology
Intestate Gas Services, Inc.
Kelly Group
Ken Bohn Consulting
Keyes & Fox LLP
Leviton Manufacturing Co., Inc.

Los Angeles County Integrated Waste Management Task Force
MRW & Associates
Manatt Phelps Phillips
Marin Energy Authority
McKenzie & Associates

Modesto Irrigation District
NLine Energy, Inc.
NRG Solar

Office of Ratepayer Advocates
OnGrid Solar
Pacific Gas and Electric Company
Peninsula Clean Energy

Pioneer Community Energy

Redwood Coast Energy Authority
Regulatory & Cogeneration Service, Inc.
SCD Energy Solutions

SCE
SDG&E and SoCalGas

SPURR
San Francisco Water Power and Sewer
Seattle City Light
Sempra Utilities
Southern California Edison Company
Southern California Gas Company
Spark Energy
Sun Light & Power
Sunshine Design
Tecogen, Inc.
TerraVerde Renewable Partners
Tiger Natural Gas, Inc.

TransCanada
Troutman Sanders LLP
Utility Cost Management
Utility Power Solutions
Water and Energy Consulting Wellhead Electric Company
Western Manufactured Housing Communities Association (WMA)
Yep Energy