

**PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA**

**Item No: 8 (Rev.1)**

**Agenda ID: 18828**

**ENERGY DIVISION**

**RESOLUTION E-5106**

**November 5, 2020**

**R E S O L U T I O N**

**Resolution E-5106:** Rejection of the 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.

**PROPOSED OUTCOME:**

- Rejects the jointly filed Advice Letters of Southern California Gas (SoCalGas) Company 5640-G, Pacific Gas and Electric Company (PG&E) 4255-G/5839-E, Southern California Edison Company (SCE) 4223-E, and the Center for Sustainable Energy (CSE) 112-E.
- Requires a joint Tier 2 advice letter from SoCalGas, PG&E, SCE, and CSE to propose a dynamic Large Thermal Energy Storage incentive methodology based on actual system specifications and site-specific monitoring and data collection, as detailed herein.

**SAFETY CONSIDERATIONS:**

The California Public Utilities Commission (CPUC) previously established safety parameters related to the Self Generation Incentive Program (SGIP). As a result, there are no expected incremental safety implications associated with approval of this Resolution.

**ESTIMATED COST:**

- There are no costs associated with this Resolution beyond funding that was previously approved for SGIP energy storage technologies in Decision 19-09-027 and Decision 20-01-021. This resolution has no additional impacts on rates.

By jointly filed Advice Letters SoCalGas 5640-G, PG&E 4255-G/5839-E, SCE 4223-E, and CSE 112-E filed on June 2, 2020, hereafter collectively SoCalGas 5640-G et al.

---

## **SUMMARY**

This Resolution rejects the jointly filed Advice Letters, Southern California Gas Company 5640-G, Pacific Gas and Electric 4255-G/5839-E, Southern California Edison 4223-E, and the Center for Sustainable Energy 112-E. Within 30 days of issuance of this Resolution, the SGIP PAs shall submit a Tier 2 Advice Letter proposing a dynamic Large Thermal Energy Storage incentive methodology based on actual system specifications and site-specific monitoring and data collection as detailed herein.

## **BACKGROUND**

The Self-Generation Incentive Program (SGIP) was established by the California Public Utilities Commission (CPUC) in 2001 through Decision (D.)01-03-073 in response to Assembly Bill (AB) 970 (Ducheny, Stats. 2000, Ch. 329). AB 970 directed the CPUC to provide incentives for distributed generation resources to reduce peak energy demand. Since 2001, the Legislature has refined and extended the SGIP several times, including expanding the program to include energy storage technologies.<sup>1</sup>

Pursuant to legislation between 2001 and 2019, Section 379.6 and Section 379.9 direct the CPUC to implement the SGIP in accordance with the following rules and objectives:

1. Increase deployment of distributed generation and energy storage systems to facilitate the integration of those resources into the electrical grid;

---

<sup>1</sup> SGIP incentives are available to any retail electric or gas distribution class of customer of the major investor-owned utilities (IOUs): Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), Southern California Gas Company (SoCalGas), and San Diego Gas & Electric (SDG&E). PG&E, SCE, and SoCalGas administer SGIP in their respective service territories. The Center for Sustainable Energy (CSE) administers SGIP for SDG&E. Thus, the four SGIP Program Administrators (PAs) are PG&E, SCE, SoCalGas, and CSE.

improve efficiency and reliability of the distribution and transmission system; reduce GHG emissions, peak demand, and ratepayer costs; and, provide for an equitable distribution of the costs and benefits of the program (Section 379.6(a)(1));

2. Limit eligibility for incentives to distributed energy resources that reduce GHG emissions (Section 379.6(b)(1)); and
3. Limit eligibility for incentives under the program to distributed energy resource technologies that meet all of these criteria:  
(1) shifts onsite energy use to off-peak time periods or reduces demand from the grid by offsetting some or all of the customer's onsite energy load, including, but not limited to, peak electric load; (2) is commercially available; (3) safely utilizes the existing transmission and distribution system; and (4) improves air quality by reducing criteria air pollutants (Section 379.6(e)).

In 2018, Senate Bill (SB) 700 (Wiener), authorized the CPUC to extend annual ratepayer collections for the SGIP from December 31, 2019 to December 31, 2024 by up to \$166 million annually and to extend administration of the program from January 1, 2021 to January 1, 2026 (Section 379.6(a)(2)). In January 2020, the CPUC implemented the newly authorized SGIP funding via D.20-01-021.

The statewide Permanent Load Shift (PLS) program<sup>2</sup>, established in D.12-04-045 was the prominent incentive program for investor-owned utility (IOU) customers who installed Thermal Energy Storage (TES) systems. TES comprises of an energy storage tank added to standard cooling equipment. The TES operates to eliminate or reduce peak period electric load for cooling by shifting energy use to off-peak periods. In anticipation of the PLS program sunset in December 2017, Trane Inc. (later, Trane Technologies, hereafter, Trane),<sup>3</sup> in seeking a successor program in support of Large Thermal Energy Storage (LTES),

---

<sup>2</sup> The PLS was a separate ratepayer-funded CPUC program from the SGIP.

<sup>3</sup> In its Protest of SoCalGas AL 5640-G et al., Trane stated that due to a corporate reorganization, Trane Technologies is the successor in interest to Trane, Inc., at 1.

submitted a Program Modification Request (PMR)<sup>4</sup> to the SGIP Program Administrators (PAs). Trane's PMR aimed to introduce appropriate rating criteria for calculating LTES incentives by proposing the use of a methodology developed by the Western Cooling Efficiency Center (WCEC) at the University of California, Davis (UC Davis) to calculate the 1-in-10-year peak kilowatt (kW) power consumption of a specific building's chillers for the sizing of the LTES system installation. That result is then used to calculate the LTES system's energy (kilowatt hour) shift as compared to the chiller's performance alone.

SoCalGas AL 5640-G et al. provides a comprehensive summary of the PMR's proposed methodology (hereafter, Trane's PMR methodology):<sup>5</sup>

1. Calculate 1-in-10-year peak kW (using the UC Davis methodology).
2. Model system kilowatt hour (kWh) in alignment with 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 Typical Meteorological Year (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.

---

<sup>4</sup> SGIP's "Program Modification Guidelines" are found in Section 4.2.7 of the SGIP Handbook. A Program Modification Request is an avenue by which SGIP stakeholders may propose changes to the SGIP. This is an informal process that resides with the SGIP PAs and is specific to the SGIP program.

<sup>5</sup> SoCalGas AL 5640-G et al. at 2.

9. Report the differential between actual performance during discharge and baseline monthly for the Performance Based Incentive (PBI)<sup>6</sup> payment period for both kWh and greenhouse gas (GHG) emissions reductions.

The SGIP PAs, in consultation with the SGIP Technical Working Group (TWG),<sup>7</sup> declined to support Trane's PMR methodology "due to its complexity, use of existing equipment specifications... which may be poorly performing resulting in a higher incentive [than one for a more efficient chiller], unreasonable administrative burden, and use of proprietary simulation models."<sup>8</sup> Instead, as a response to the request, the SGIP TWG developed an alternate methodology to calculate the kW and kWh offsets for LTES systems. The SGIP TWG based their proposed methodology on the California Energy Commission's (CEC) Non-Residential Alternative Calculation Method Reference Manual. As with Trane's PMR methodology, the SGIP TWG used the 1-in-10-year peak weather conditions to calculate the kW offset.

The SGIP TWG and Trane did not, however, come to an agreement on a preferred methodology to determine the rating criteria for LTES systems, and the PAs did not take further action on the PMR. A proposed methodology for LTES incentive calculation was never formally submitted to the CPUC for consideration.

On December 31, 2018, the CPUC released an Assigned Commissioner's Ruling (ACR) issuing the Energy Division's *Revised Self-Generation Program Greenhouse Gas Staff Proposal for Comments*. The ACR specifically asked parties to comment on certain components of the Revised Staff Proposal including the applicability of the proposed new Greenhouse Gas (GHG) emissions reduction rules to

---

<sup>6</sup> Under the SGIP Performance Based Incentive (PBI) scheme, a portion (typically 50 percent) of the total estimated incentive amount is paid upfront, and the remaining amount is paid out based on the actual annual kilowatt hour output of the system over at most five years.

<sup>7</sup> The SGIP TWG is comprised of technical representatives from each of the SGIP PAs and Alternative Energy Systems Consulting, Inc. (AESC), the SGIP PAs' engineering consultant.

<sup>8</sup> SoCalGas AL 5640-G et al. at 2.

thermal energy storage (TES) systems, in general, without drawing a distinction between large and small TES systems. The ACR noted that:

The Revised Staff Proposal was developed with electrochemical storage technologies in mind, however thermal energy storage technologies receiving SGIP incentives are also required by statute to reduce GHG emissions. Therefore, we specifically request that parties comment on whether the rules proposed in the Revised Staff Proposal should be applied to thermal energy storage technologies as is, or whether modifications to the rules are needed (if so, please specify).<sup>9</sup>

Five parties (CSE, SoCalGas, PG&E, the California Energy Storage Alliance (CESA), and Trane) provided comments to the ACR, generally agreeing that the Revised Staff Proposal's GHG rules could be effectively applied to TES. CESA and Trane asserted that, different from electrochemical storage which is a relatively static technology, TES systems are dynamic assets whose grid impact at any given time is directly correlated with ambient air temperature and whether the host building is occupied. Therefore, CESA and Trane argued the actual grid impact and GHG performance of TES should be assessed using real-time data and analysis that accounts for the variables pertaining to a given TES system and its location.

In their comments to the ACR, PG&E recommended the CPUC should evaluate the GHG performance of a TES system after one year to ensure these systems were able to meet the new GHG reduction requirements.

Subsequently, on August 9, 2019, the CPUC issued Decision (D.) 19-08-001, *Decision Approving Greenhouse Gas Emission Reduction Requirements for The Self Generation Incentive Program Storage Budget*, establishing new GHG performance, verification, and enforcement standards for both "electrochemical and TES systems because both types of systems can potentially increase GHGs."<sup>10</sup> Further, D.19-08-001 noted that party comments on the ACR indicated that

---

<sup>9</sup> Assigned Commissioner's Ruling (December 31, 2018) at 3.

<sup>10</sup> D.19-08-001 at 71.

modifications to the adopted GHG and other SGIP rules may be necessary to ensure the appropriate application of the GHG requirements to TES.

D.19-08-001 directed CPUC Energy Division staff and the SGIP PAs to hold a TES Working Group to discuss the "...adopted GHG requirements for TES systems, including system, operation, measurement, verification and performance evaluation requirements, and other issues related to TES system participation in SGIP" and, if necessary, "recommend in the Implementation Plan Tier 2 advice letter approved elsewhere in [D.19-08-001] minor modifications to SGIP system, operation, measurement, verification, and performance evaluation requirements to accommodate TES systems' conformance with the GHG rules adopted in this decision".<sup>11</sup>

The TES Working Group convened on September 13, 2019 with representatives from the PAs and the TES industry in attendance to discuss any potential barriers the new rules established in D.19-08-001 may have presented to TES participation in SGIP. However, the TES Working Group did not identify or recommend minor rule changes in SGIP that would be necessary to ensure TES systems' success in complying with the SGIP's new GHG emissions reduction requirements.

Pursuant to D.19-08-001, on November 27, 2019, the SGIP PAs jointly submitted SCE AL 4118-E, PG&E AL 4186-G/5701-E, SoCalGas AL 5551-G, and CSE AL 104-E (SCE AL 4118-E et al.), proposing revisions to the SGIP Handbook pursuant to the GHG reduction requirements in D.19-08-001.

On December 17, 2019, Trane and DN Tanks protested SCE AL 4118-E et al., stating that the SGIP Handbook revisions proposed did not fully comply with the requirements in D.19-08-001 because the SGIP PAs failed to propose an incentive calculation methodology for LTES. CESA submitted a response to SCE AL 4118-E et al., which presented similar concerns regarding the lack of a proposed methodology for calculating LTES incentives.

---

<sup>11</sup> Ibid.

On December 24, 2019, the SGIP PAs submitted a joint reply to the protest and response, in which they disagreed that SCE AL 4118-E et al. did not meet the requirements of D.19-08-001. The PAs pointed to the language in D.19-08-001 authorizing only “minor” proposed modifications to the new and existing SGIP requirements to accommodate TES conformance, as needed. The PAs then recommended that a separate AL address the need for a proposed LTES incentive calculation methodology.

In a non-standard disposition letter issued on February 24, 2020, the CPUC’s Energy Division approved SCE AL 4118-E et al. The letter, however, noted that “the lack of an approved incentive calculation methodology is an undue barrier to LTES participation in the SGIP” as “it is not a goal of the SGIP to favor certain energy storage technologies over others.”<sup>12</sup> Therefore, in the non-standard disposition letter, CPUC Energy Division staff recommended the PAs submit a joint AL to propose an LTES incentive calculation methodology.

### **The SGIP PAs’ Proposed LTES Incentive Calculation Methodology**

On June 2, 2020, the SGIP PAs submitted a proposed LTES incentive calculation methodology (hereafter, the SGIP PAs’ methodology) via the jointly filed Advice Letter: SoCalGas AL 5640-G, PG&E AL 4255-G/5839-E, SCE AL 4223-E, and CSE AL 112-E (SoCalGas AL 5640-G et al.).

In SoCalGas AL 5640-G et al., the SGIP PAs propose a methodology based on the California Energy Commission (CEC) 2019 Nonresidential Alternative Calculation Method Reference Manual to assess both the baseline (initial incentive) and measured (PBI) performance. This methodology uses CEC-approved deemed-value chiller curves, also included in the California Building Energy Compliance (CBEC) software for Title 24 compliance. These CEC deemed

---

<sup>12</sup> *Energy Division Non-Standard Disposition Letter on SCE AL 4118-E/-A/-B, PG&E AL 4186 G/-A/-B/5701-E/-A/-B, SoCalGas AL 5551-G/-A/-B, and CSE AL 104-E/-A/-B, Revisions to the Self-Generation Incentive Program Handbook Incorporating Changes Related to Greenhouse Gas Emissions Reduction Requirements Pursuant to Ordering Paragraph 2 of Decision D.19-08-001*, Attachment 1 at 6.



chiller values reflect the average performance of new chiller technologies available as of 2019 and after.

The SGIP PAs argue that their proposed methodology has a number of advantages over the methodology proposed in Trane's December 2017 Program Modification Request in that it:<sup>13</sup>

- follows a CEC-approved methodology;
- similar to Trane's proposal, uses the 1-in-10-year peak weather conditions to calculate the kW and kWh offsets;
- adapts easily to different types of LTES systems, including ice-on-coil and stratified chilled water systems;
- is consistent across projects (i.e., chiller curves are not derived on a project by project basis);
- does not allow overestimation of the SGIP incentive based on the chiller curves for poorly performing existing equipment;
- is similar to the methodology currently being used in the SGIP for small thermal energy storage (STES); and
- requires a one-time development of streamlined calculation spreadsheets for the upfront and PBI portions of the incentive, which minimizes the administrative burden and costs associated with the technical review of these projects.

## **NOTICE**

Notice of: SoCalGas AL 5640-G, PG&E AL 4255-G/5839-E, SCE AL 4223-E, and CSE AL 112-E (SoCalGas AL 5640-G et al.) was made by publication in the Commission's Daily Calendar. The SGIP PAs states that a copy of the Advice Letter was mailed and distributed in accordance with Section 4 of General Order 96-B.

## **PROTESTS**

On June 22, 2020, SoCalGas AL 5640-G et al. was timely protested by CESA and Trane.

---

<sup>13</sup> SoCalGas AL 5640-G et al. at 4.

On June 29, 2020, the SGIP PAs submitted a joint reply to the protests filed by CESA and Trane.

This section provides a summary of the major issues raised in the protests to SoCalGas AL 5640-G et al. and the SGIP PAs' responses.

### **Challenges to the Accuracy of the SGIP PA's Proposed LTES Incentive Calculation Methodology**

In their protests, CESA and Trane ask that the CPUC's Energy Division reject SoCalGas AL 5640-G et al. broadly due to the use of "deemed" chiller curves in the SGIP PAs' proposed methodology for calculating LTES incentives. Both protestors argue that the deemed curve approach is inaccurate and will not address existing barriers to participation by LTES in SGIP.

According to the CESA's protest, without site-specific data "for chillers that are inherently dynamic, the deemed values will most certainly be inaccurate and not represent the actual characteristics and performance of the specific project and location."<sup>14</sup> Trane further asserts that due to a "combination of chiller variability and the 'average of averages' nature of the [SGIP PAs' proposed methodology]," some LTES systems' performance will be overestimated, "...while others will have their actual impact underestimated."<sup>15</sup> In this way, Trane argues that the PAs' proposed methodology does not prevent overpayment. Therefore, CESA and Trane consider the use of deemed chiller curves as inferior to Trane's December 2017 Program Modification Request proposal to use data from the specific project site to make a more accurate calculation of a LTES system's initial performance estimation for determining the incentive amount, which is then updated with actual site data during the PBI period.

CESA and Trane's protest also disagrees with the SGIP PAs' claim in SoCalGas AL 5640-G et al. that the use of deemed-value curves is preferable to Trane's proposed methodology because of the latter's reliance on proprietary simulation models would hinder the PAs' ability to verify data and analysis submitted by

---

<sup>14</sup> CESA Protest of SoCalGas AL 5640-G et al. at 6.

<sup>15</sup> Trane Protest of SoCalGas AL 5640-G et al. at 9.

applicants for LTES projects. CESA points to the availability of a number of proprietary simulation models that comply with existing engineering and industry standards<sup>16</sup> and could, therefore, be used for the SGIP LTES incentive calculation without the additional need for reviewing the models for accuracy. As long as the energy simulation model is compliant with industry standards and is calibrated to the energy consumption by the chiller plant only, CESA suggests that proprietary tools are appropriate for use in SGIP incentive calculation.

Moreover, CESA suggests that although “industry standards should be more than sufficient”, the SGIP PAs could conduct an independent third-party review of software tools to verify the accuracy of a model’s functionalities.<sup>17</sup> However, CESA is opposed to the implementation of such a requirement if the process further delays the adoption of an SGIP LTES incentive calculation methodology.

### **Additional Comments on Incentive Payments based on Existing Equipment Specifications**

In their protests, CESA and Trane dispute the assertion made in SoCalGas AL 5640-G et al. that the SGIP PAs’ proposed methodology avoids overestimation of the SGIP incentive based on the chiller curves for poorly performing existing equipment. CESA and Trane question what “overestimation” or “overpayment” means if the SGIP incentive is meant to provide compensation that is commensurate with the grid benefits and improved efficiency of adding LTES to existing equipment. CESA and Trane also observe that SGIP already has effective safeguards in place to prevent payment above the total eligible cost of all energy storage projects applying for SGIP incentives.<sup>18</sup> Citing section 3.2.2 of the SGIP Handbook, CESA and Trane note that SGIP provides a comprehensive summary of project costs that can count toward the

---

<sup>16</sup> In its protest of SoCalGas AL 5640-G et al., CESA cites compliance with standards set by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) as one potential requirement for propriety modeling software used for LTES applications to SGIP, at 7.

<sup>17</sup> CESA Protest of SoCalGas AL 5640-G et al. at 7.

<sup>18</sup> *Please see* SGIP Handbook v.7 (July 15, 2020) at 28.

total incentive calculation, which must be reported and substantiated at the application stage. SGIP projects cannot receive total incentives in excess of the total eligible project costs. Therefore, CESA and Trane argue that additional incentive limitations based on new efficiency requirements for existing equipment are not warranted.

### **The SGIP PAs' Proposed Methodology's Alignment with Deemed Methodology Adopted for STES**

CESA and Trane's protests challenge the SGIP PAs' assertion that one of the advantages of the PAs' proposed methodology is its alignment with the existing deemed methodology used for small thermal energy storage (STES) systems. Due to the cost of monitoring and reporting as a ratio of total project cost, both protestors view the size distinction between the two energy storage categories as providing sufficient rationale for having separate SGIP incentive calculation schemes based on a system's given size. According to Trane, the current availability of advanced monitoring equipment makes system monitoring and verification easier and more cost-efficient than before. For LTES systems with more than 10,000 tons of cooling capacity, compared to STES's 3 to 10 ton cooling capacity range, the cost of monitoring equipment can be less than 1 percent of the overall project cost. Therefore, CESA and Trane argue that implementing an SGIP LTES methodology based on actual project performance and monitoring data, as opposed to a deemed approach, is reasonable.

### **LTES Projects under the Performance, Verification, and Enforcement Standards set by D.19-08-001**

CESA and Trane's protest asserts that the proposed LTES incentive calculation methodology in SoCalGas AL 5640-G et al. is not compliant with D.19-08-001 in supporting LTES participation in SGIP. In D.19-08-001, the CPUC instituted project-level GHG performance requirements including site-specific reporting and verification requirements for all commercial projects applying to the SGIP after April 1, 2020.<sup>19</sup> Trane and CESA argue that the PAs' proposed deemed-curve approach does not align with those project-specific requirements in D.19-08-001. CESA explains "because of the variability in both chiller design and

---

<sup>19</sup> D.19-08-001, Conclusion of Law 10 at 104.

performance..., the performance of the chiller, and therefore the grid impact of an L-TES system incentivized under SGIP, is not just variable across a range of conditions, it is also dynamic from chiller to chiller.”<sup>20</sup> Therefore, using deemed curves does not accurately measure the performance of specific LTES projects across varying conditions and is “inherently less accurate in...reporting [the] GHG impacts of a given site.”<sup>21</sup> Conversely, CESA and Trane argue, the methodology proposed in Trane’s December 2017 Program Modification Request complies with D.19-08-001 requirements in that it is able to account for the “specific and unique characteristics of LTES by project and location.”<sup>22</sup>

### **The SGIP PAs’ Joint Reply to Protests of SoCalGas AL 5640-G et al.**

In their joint reply to Trane’s and CESA’s protests in response to SoCalGas 5640-G et al., the SGIP PAs address each of the points discussed in the sections above.

#### *Challenges to the Accuracy of the SGIP PAs’ Proposed LTES Incentive Calculation Methodology*

The SGIP PAs reply to CESA’s and Trane’s protests regarding the lack of accuracy of the SGIP PAs’ proposed methodology by stating that they have evidence to the contrary. According to the SGIP PAs, modeling<sup>23</sup> conducted by the PAs’ technical team using deemed chiller curves showed that their proposed methodology is in fact accurate within 5 percent of the performance specifications of a variety of chiller models, even at 1-in-10-year temperatures. The SGIP PAs further clarify that their proposed methodology uses actual site data to determine the kW and kWh offset of chillers during the PBI period. In the SGIP PAs’ view, therefore, their proposed methodology is a dynamic approach that is accurate and uses actual data during the PBI stage.

#### *Additional Remarks on Incentive Payments based on Existing Equipment Specifications*

---

<sup>20</sup> CESA Protest of SoCalGas AL 5640-G et al. at 5.

<sup>21</sup> Trane Protest of SoCalGas AL 5640-G et al. at 7.

<sup>22</sup> CESA Protest of SoCalGas AL 5640-G et al. at 5.

<sup>23</sup> The PA technical team’s modeling of the proposed methodology has not been submitted to the CPUC for review and verification.

In their reply to the CESA and Trane protests, the SGIP PAs reiterate their argument that their proposed methodology has an important advantage over Trane's December 2017 Program Modification Request in that it will not encourage LTES system installations paired with older, less efficient chillers. The SGIP PAs express their agreement with CESA that there is significant variability in both chiller design and performance, but they view this fact as further justification for using standardized chiller performance curves. As a result, when LTES is paired with older, less efficient chillers, the kWh offset and corresponding incentive payment is not higher than when LTES is paired with existing chiller equipment that is newer and more efficient. The PAs contend that their proposed methodology "will result in LTES projects paired with newer, higher efficiency, chillers and the replacement of older, poorer performing chillers."<sup>24</sup> In contrast, the PAs argue, by not establishing performance standards for chillers, Trane's PMR methodology could incentivize LTES paired with less efficient existing equipment.

*The SGIP PAs' Proposed Methodology's Alignment with Deemed Methodology Adopted for STES*

In their reply to the protests, the SGIP PAs clarify that their recommendation of a proposed methodology is in line with the deemed SGIP incentive calculation methodology currently in place for STES and is not based on the cost and difficulty of monitoring and verification relative to the total project cost. The SGIP PAs further explain that STES projects are typically comprised of multiple systems, the aggregated size of which triggers PBI and the associated requirements for the measurement and reporting of operating performance. Therefore, the cost of monitoring and verification is not the main justification behind the SGIP PAs' proposed methodology. Rather, the SGIP PAs contend that they recommend a similar deemed approach for both LTES and STES due to the list of advantages that the PAs argue are associated with using deemed performance curves that have been vetted and used statewide by the CEC.

*LTES Projects under the Performance, Verification, and Enforcement Standards set by D.19-08-001*

---

<sup>24</sup> SGIP PAs' Reply to Protests of SoCalGas AL 5640-G et al. at 6.

The SGIP PAs oppose Trane's and CESA's arguments that the SGIP PAs' proposed methodology fails to comply with Section 9.1 of D.19-08-001 requirements for "a dynamic approach and actual data" in the assessment of LTES performance.<sup>25</sup> The SGIP PAs point out that this directive is aimed at the "SGIP evaluator" for program evaluation purposes and not for measuring system performance for incentive payment considerations. For this reason, the PAs assert that their proposed methodology does comply with directives in D.19-08-001.

## **DISCUSSION**

In their protests to SoCalGas AL 5650-G et al., CESA and Trane ask the CPUC to reject the SGIP PAs' proposed methodology for calculating LTES incentives. The protestors argue that the PAs' proposed methodology is inadequate in addressing barriers to LTES participation in SGIP because it does not accurately measure LTES system performance, which is the basis for calculating any SGIP project's total incentive amount, as well as its PBI payments. In contrast, the SGIP PAs argue that their proposed methodology has the advantage of establishing performance standards for all chillers paired with LTES so that the incentive paid to projects with less efficient existing chillers is not higher than that paid to more efficient chiller equipment.

We do not agree with the PAs' assertion that their proposed methodology should be used to establish SGIP incentives for LTES because the use of standardized chiller curves will prevent SGIP incentivizing of pairing LTES with older lower performing systems. The CPUC has not adopted a policy in this proceeding against incentivizing thermal storage for facilities with older, less efficient chillers. We find that it is not within the PAs' authority to base their proposed rules for calculating LTES incentives on a policy that has not been vetted at the proceeding level.

Furthermore, existing SGIP rules include provisions for evaluating the energy efficiency of the building or site where an SGIP project is being added. D.11-09-015 established an Energy Efficiency Audit requirement for all projects

---

<sup>25</sup> D.19-08-001 at 71.

receiving SGIP incentives, regardless of technology type.<sup>26</sup> As part of the Energy Efficiency Audit, applicants were required to implement any identified energy efficiency measures with a payback period of two years or less prior to receiving the upfront incentive payment. However, in D.16-06-055, the CPUC found that the general requirement for energy efficiency investments is incompatible with SGIP goals and stated:

We continue to support the requirement for an energy efficiency audit, which is consistent with the State's loading order and supported by most parties. However, we remove the previous rule requiring customers to invest in measures with a two year payback. While the Commission continues to support energy efficiency, we do not find that a uniform requirement to invest is an efficient way to support innovation and instead prescribes customers' investment choices.<sup>27</sup>

Given the CPUC's rationale for removing the prerequisite implementation of minimal energy efficiency measures based on the Energy Efficiency Audit, we find further justification for rejecting the PAs' proposed LTES methodology. In D.16-06-055, the CPUC clearly determined that it is not the role of the program, or the PAs, to direct applicants' energy efficiency investments outside of the system installation incentivized by the SGIP. Therefore, the PAs' argument that standard chiller curves are necessary to ensure the program does not encourage LTES pairings with less efficient existing equipment conflicts with the previous CPUC determinations made in D.16-06-055.

In addition, we note that the current SGIP rules for calculating incentives for battery storage technologies are based on the actual performance of the system in kWhs, which corresponds to a reduction in a facility's existing load and not what the facility's load would be using new efficient equipment that complies with current building code standards. Likewise, we determine that the SGIP LTES incentive calculation methodology shall be based on site-specific monitoring and data collection and the actual performance of the LTES being paired with

---

<sup>26</sup> *Please see* SGIP Handbook v.7 (July 15, 2020) at 54.

<sup>27</sup> D.16-06-055 at 44.



existing equipment. However, at this time, we decline to adopt Trane's methodology as proposed in its December 2017 Program Modification Request because it was never formally submitted to the CPUC for review. Instead, the PAs shall propose, via a joint Tier 2 Advice Letter, a "dynamic" methodology, the same or similar to Trane's PMR methodology, that uses project-specific data to calculate LTES systems' initial performance estimation for determining the total estimated incentive amount, which is then updated with actual site data during the PBI period.

Notwithstanding, we share the SGIP PAs' expressed concern that a dynamic methodology will necessitate review and verification of performance estimates determined by using proprietary simulation models. Therefore, we direct the PAs to work with their technical staff and with industry to identify and propose industry standards and/or certifications for LTES applicants who submit their initial system performance estimates using proprietary simulation models. The PAs shall also propose in their joint Tier 2 Advice Letter a clear list of documentations needed to substantiate an LTES applicant's initial system performance estimate and requested incentive amount, as well as a proposed list of metering requirements to enable the necessary level of data collection during the PBI stage.

In addition, although we agree with CESA and Trane regarding the importance of modifying SGIP rules and requirements to mitigate barriers to LTES' participation, due to low participation rates to date, the SGIP has not had the opportunity for lessons-learned in terms of evaluating and verifying LTES installations from the application stage through the end of the PBI payment period. To date, the SGIP has received only 15 applications and nine successful reservations for LTES projects.<sup>28</sup> In their protests, CESA and Trane seek to provide assurances that the appropriate software and monitoring equipment are readily available to facilitate the successful implementation of a dynamic incentive calculation methodology for SGIP LTES. However, at this time, we do not have the experience or data to verify the feasibility of using a dynamic methodology to calculate LTES incentives accurately. Therefore, we adopt a

---

<sup>28</sup> SGIP "Weekly Statewide Report", [www.selfgenca.com](http://www.selfgenca.com) (accessed August 18, 2020)

provisional one-year 30/70 PBI<sup>29</sup> structure for LTES, meaning that 30 percent of the total incentive will be paid upfront based on the applicant's requested incentive amount estimated using the applicant's proprietary modeling. The remaining 70 percent will be paid out, based on actual performance, over at most five years.

All LTES applications must include a metering and performance verification methodology that is compliant with the PAs' proposed list of requirements in the joint Tier 2 Advice Letter ordered above, as well as with SGIP reporting requirements for storage system performance and GHG reduction monitoring and verification rules already in place. All such "Metering and Performance Verification Plans" shall be vetted and approved by the PAs before the incentive reservation is confirmed. This will ensure the initial incentive amounts requested as part of LTES applications are accurate and actual system performance is reasonably consistent with the estimated performance.

The provisional period shall begin on the date the first LTES application is successfully reserved. After one year, should five LTES incentive reservations be submitted, within 60 days, the PAs shall file their recommendation for or against restoring the 50/50 PBI structure for LTES to the Energy Division via a joint Tier 2 advice letter. Concurrently, if after one year fewer than five successful LTES reservations have been received, the 30/70 PBI structure shall remain. Thereafter, the PAs shall file their recommendation for or against restoring the 50/50 PBI structure for LTES to the Energy Division via a joint Tier 2 advice letter within 60 days of receiving the fifth successful LTES reservation. The PAs shall base their recommendations for, or against, restoring the 50/50 PBI structure on significant issues with the LTES incentive calculation methodology process, substantiated by documentation and/or data. For example, the PAs should document observed inaccuracies in the methodology, persistent issues with data reporting and verification, or excessive administrative burden. The eventual

---

<sup>29</sup> Other than the provisional 30/70 PBI structure specific to LTES systems for one year after the first successful LTES application is filed with the SGIP PAs, LTES projects are subject to all other existing PBI rules as outlined in Section 5.3.4 "Performance Based Incentive Payment (PBI)" of the SGIP Handbook.

restored 50/50 PBI structure will apply to LTES projects going forward only (i.e. the sixth, seventh, etc. LTES reservation).

In regards to the SGIP PAs' argument that consistency in the LTES and STES incentive calculation methodologies is appropriate, we note that the SGIP has a history of applying different rules to accommodate projects' financial and operational characteristics that vary by size. For example, although D.19-08-001 collapsed the then existing distinction between small (less than 30kW) and large (30 kW or more) commercial energy storage systems for PBI purposes, the decision eased the metering requirements for smaller projects due to the potentially high financial burden of requiring that these projects install revenue-grade meters for PBI reporting.<sup>30</sup> Therefore, at this time, we maintain the existing STES methodology, while directing the PAs to propose a dynamic incentive calculation methodology for LTES.

We now discuss CESA's and Trane's protest of SoCalGas AL 5640-G et al. based on their argument that the SGIP PAs' proposed methodology does not comply with D.19-08-001 in supporting LTES participation in SGIP. This issue was previously addressed in the Energy Division-issued non-standard disposition letter approving SCE AL 4118-E et al., which agreed with the PAs that the "minor modifications to the GHG rules authorized by the decision [D.19-08-001] do not provide authority to the PAs to submit a proposal for a wholly new methodology for calculating L-TES incentives."<sup>31</sup> We reassert this finding here. Therefore, with the inclusion of the modification directed in this resolution, SoCalGas AL 5640-G et al. does not violate the directives in D.19-08-001. Thus, we dismiss the protests of CESA and Trane on this issue as moot.

---

<sup>30</sup> In order to strengthen the incentive for all commercial projects to reduce GHG emissions, D.19-08-001 ordered the application of all PBI rules to all new commercial projects, regardless of size at 20-21.

<sup>31</sup> Energy Division non-standard disposition letter of SCE AL 4118-E et al., Attachment 1 at 4.

**COMMENTS**

Public Utilities Code section 311(g)(1) provides that this resolution must be served on all parties and subject to at least 30 days public review. Please note that comments are due 20 days from the mailing date of this resolution. Section 311(g)(2) provides that this 30-day review period and 20-day comment period may be reduced or waived upon the stipulation of all parties in the proceeding.

The 30-day review and 20-day comment period for the draft of this resolution was neither waived nor reduced. Accordingly, this draft resolution was mailed to parties for comments, and will be placed on the Commission's agenda no earlier than 30 days from today.

Comments were timely filed on October 26, 2020 by the California Energy Storage Alliance (CESA) and Trane Technologies (Trane).

*PAs should work with industry to develop a new LTES incentive calculation methodology*

In comments, both CESA and Trane express support for the draft resolution's affirmation that a site-specific, performance and data-based methodology is necessary for LTES systems receiving incentives under SGIP. Both CESA and Trane, however, express concern that the draft resolution gives the SGIP PAs discretion to determine whether it would be necessary for their technical staff to work with industry on a new proposed LTES incentive calculation methodology. Given the delay in establishing a viable LTES incentive calculation methodology and the technical nature of the task at hand, CESA and Trane argue that the PAs should work closely with industry to develop the proposed methodology included in the Tier 2 Advice Letter ordered in this Resolution. We agree with the protestors that working with industry from the start could help mitigate the likelihood of additional disputes between the SGIP PAs and industry and consequent delays to the adoption of a new methodology. We therefore, direct the PAs to consult with industry in developing their new proposed LTES incentive calculation methodology, including on how best to incorporate the use of proprietary software while safeguarding data reporting and integrity during the application process. This resolution has been modified accordingly.

*LTES 30/70 PBI Provisional Period*

Both CESA and Trane state the proposed 30/70 PBI structure proposed in the draft resolution is reasonable for the first five LTES applications but request further clarification on whether the 50/50 PBI structure will be restored as soon as five successful project applications are received and whether the restored 50/50 PBI structure will apply to LTES projects going forward. We clarify that the provisional 30/70 period is established for at least one year after the first successful LTES application is filed. If within that year, five successful LTES applications are filed, the PAs, within 60 days, shall submit a Tier 2 Advice Letter with a recommendation for, or against, restoring the 50/50 PBI structure for LTES projects on a forward basis only.

CESA and Trane also express concern that the draft resolution requires the PBI portion of the SGIP incentive for LTES systems to be paid out over the full five-year period, whereas other energy storage technologies under SGIP are able to accelerate their PBI payments to less than five years by exceeding expected annual performance. We clarify that LTES systems shall be subject to the same PBI rules as other energy storage technologies, as outlined in Section 5.3.4. of the SGIP Handbook and that LTES “PBI payments will be paid annually based on the recorded kWh of electricity discharged or offset over the previous 12 months.”<sup>32</sup> In this way, LTES projects may be able to receive their full PBI amount in less than five years if their actual annual performance exceeds their expected annual performance.

In their comments on the draft Resolution, CESA recommends additional guidance to inform the SGIP PAs on what is considered a reasonable basis for the PAs to recommend against the restoration of the 50/50 PBI payment structure, after 5 LTES reservations and the one year provisional period are reached. We find CESA’s suggestion reasonable and clarify that the PAs shall base their recommendations for or against restoring the 50/50 PBI structure on significant issues with the LTES incentive calculation methodology process, substantiated by documentation and/or data – for example, observed inaccuracies in the methodology, persistent issues with data reporting and verification, and excessive administrative burden. The resolution is modified accordingly.

---

<sup>32</sup> *Please see* SGIP Handbook v.7 (July 15, 2020) at 53.

*Capacity and Performance Evaluation Methodologies for Dynamic Assets*

Trane and CESA recommend the CPUC develop capacity and performance evaluation methodologies for LTES and other dynamic assets, in general, in an existing or new rulemaking. This recommendation falls outside the scope of this Resolution and will not be addressed herein.

**FINDINGS**

1. Assembly Bill (AB) 970 (Ducheny, Stats.2000, Ch.329) directed the California Public Utilities Commission (CPUC) to provide incentives for distributed generation resources to reduce peak energy demand.
2. The Self Generation Incentive Program (SGIP) was established by the CPUC in 2001 in Decision (D.) 01-03-073 in response to AB 970.
3. Since 2001, the California State Legislature has modified and extended SGIP several times, including expanding the program to include energy storage technologies.
4. SGIP is jointly administered by Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), Southern California Gas Company (SoCalGas), and the Center for Sustainable Energy (CSE) on behalf of San Diego Gas & Electric Company (SDG&E), jointly the SGIP Program Administrators (PAs).
5. SB 700 (Wiener, 2018), authorized the CPUC to extend annual ratepayer collections for the SGIP from December 31, 2019 to December 31, 2024 by up to \$166 million annually and to extend administration of the program from January 1, 2021 to January 1, 2026. The newly authorized SGIP funding was implemented by D.20-01-021.
6. The statewide Permanent Load Shift (PLS) program, established in D.12-04-045, was the prominent incentive program for IOU customers who installed Thermal Energy Storage (TES) systems, ended in December 2017.
7. In December 2017, Trane Inc. (later, Trane Technologies), submitted a Program Modification Request (PMR) to the SGIP PAs seeking a successor program in support of Large Thermal Energy Storage (LTES) within SGIP.

8. The SGIP TWG did not agree with Trane's proposed methodology, and the SGIP PAs never sought to implement the request in Trane's PMR by filing an advice letter to the Energy Division to formally modify SGIP.
9. On December 31, 2018, the CPUC released an Assigned Commissioner's Ruling (ACR) issuing the Energy Division's *Revised Self-Generation Program Greenhouse Gas Staff Proposal for Comments* and requesting comments on components of the Revised Staff Proposal including the applicability of the proposed new Greenhouse Gas (GHG) emissions reduction rules to TES systems.
10. On August 9, 2019, the CPUC issued Decision (D.) 19-08-001, *Decision Approving Greenhouse Gas Emission Reduction Requirements for The Self Generation Incentive Program Storage Budget*. D.19-08-001 directed Energy Division staff and the SGIP PAs to hold a TES Working Group to discuss whether minor modifications to the SGIP GHG rules were necessary to ensure TES compliance with new GHG performance standards.
11. The TES Working Group convened on September 13, 2019 with representatives from across the TES industry in attendance. The TES Working Group did not identify or recommend minor rule changes in SGIP that would be necessary to ensure TES systems' success in complying with the SGIP's new GHG emissions reduction requirements.
12. On November 27, 2019, the SGIP PAs jointly submitted SCE Advice Letter 4118-E et al., which proposed revisions to the SGIP Handbook pursuant to the GHG reduction rules in D.19-08-001.
13. On February 24, 2020, the CPUC Energy Division approved SCE AL 4118-E et al. in a Non-standard Disposition Letter, and recommended the PAs submit a joint AL to propose an LTES incentive calculation methodology.
14. On June 2, 2020, the SGIP PAs submitted a proposed LTES incentive calculation methodology via jointly filed SoCalGas AL 5640-G et al.
15. On June 22, 2020, the California Energy Storage Alliance (CESA) and Trane Technologies (Trane) each filed a timely protest to SoCalGas AL 5640-G et al.
16. The SGIP PAs submitted a reply to the protests filed by CESA and Trane on June 29, 2020.
17. It is not within the SGIP PAs' authority to establish a policy for encouraging newer, more efficient equipment at sites where SGIP-eligible technology is installed.

18. D.16-06-055 found that prescribing SGIP participants' energy efficiency investment choices is not an efficient way to promote innovation and should not remain as part of the SGIP rules.
19. Current SGIP rules for calculating battery storage are based on the actual performance of the system in kWh, which corresponds to a reduction in a facility's existing load and not what the facility's load would have been using new efficient equipment that complies with current building code standards.
20. Similar to battery storage, LTES incentive calculations should be based on site-specific monitoring and data collection to determine the actual performance of the LTES system.
21. The CPUC cannot adopt Trane's LTES incentive calculation methodology as proposed in its December 2017 Program Modification Request because it was never formally submitted to the CPUC for review.
22. A dynamic methodology that uses project-specific data to estimate the LTES system's initial incentive amount necessitates the use of proprietary modeling software.
23. Due to low participation rates by LTES systems in SGIP, the SGIP has not had the opportunity for lessons-learned in terms of reviewing and verifying applications that use proprietary software to calculate the initial incentive amount and monitoring equipment to determine actual performance during the PBI stage.
24. Establishing distinct incentive calculation methodologies for STES and LTES is consistent with past and current SGIP rules that provide different implementation rules for small (less than 30 kW) and large (30 kW or more) commercial energy storage systems.
25. SCE AL 4118-E does not violate directives in D.19-08-001.

**THEREFORE, IT IS ORDERED THAT:**

1. The request in Southern California Gas Company (SoCalGas) Advice Letter (AL) 5640, Pacific Gas & Electric Company (PG&E) AL 4255-G/5839-E, Southern California Edison Company (SCE) AL 4223-E, and Center for Sustainable Energy (CSE) AL 112-E is denied.



2. Southern California Gas Company (SoCalGas), Pacific Gas & Electric Company (PG&E), Southern California Edison Company (SCE), and Center for Sustainable Energy (CSE) shall submit a joint Tier 2 Advice Letter proposing a dynamic methodology for Large Thermal Energy Storage incentive calculations, as defined in this Resolution, and Self-Generation Incentive Program Handbook revisions including all requirements discussed herein, within 30 days of the effective date of this Resolution.
3. After one year of the provisional Large Thermal Energy Storage (LTES) 70/30 Performance Based Incentive (PBI) period, should five LTES incentive reservations be submitted, within 60 days, the Self-Generation Incentive Program (SGIP) Program Administrators (PAs) shall file their recommendation for or against restoring the 50/50 PBI structure for LTES to the Energy Division via a joint Tier 2 advice letter. Concurrently, if after one year fewer than five successful LTES reservations have been received, the 30/70 PBI structure shall remain. Thereafter, the SGIP PAs shall file their recommendation for or against restoring the 50/50 PBI structure for LTES to the Energy Division via a joint Tier 2 advice letter within 60 days of receiving the fifth successful LTES reservation.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on November 5, 2020; the following Commissioners voting favorably thereon:

---

RACHEL PETERSON  
Acting Executive Director