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

Pacific Gas & Electric Company
ELC (Corp ID 39)
Status of Advice Letter 4593G/6553E
As of June 6, 2022

Subject: Joint AL Revised Proposal for Self-Generation Incentive Program (SGIP) Residential Price Cap in Accordance with Decision 19-09-027, Ordering Paragraphs 7(g) and 8(a).

Division Assigned: Energy

Date Filed: 04-04-2022

Date to Calendar: 04-11-2022

Authorizing Documents: D1909027

Disposition:	**Accepted**
Effective Date:	**05-04-2022**

Resolution Required: No

Resolution Number: None

Commission Meeting Date: None

CPUC Contact Information:

edtariffunit@cpuc.ca.gov

AL Certificate Contact Information:

Stuart Rubio
(415) 973-4587
PGETariffs@pge.com

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Disposition of Filing (Accepted, Rejected, Withdrawn, etc.)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

Pacific Gas and Electric Company®

Sidney Bob Dietz II
Director
Regulatory Relations

Pacific Gas and Electric Company
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April 4, 2022

Advice 4593-G/6553-E
(Pacific Gas and Electric Company U 39-M)

Advice 135-E
(Center for Sustainable Energy®)

Advice 4763-E
(Southern California Edison Company U 338-E)

Advice 5960-G
(Southern California Gas Company U 904-G)

Public Utilities Commission of the State of California

Subject: **Revised Proposal for Self-Generation Incentive Program (SGIP) Residential Price Cap in Accordance with Decision 19-09-027, Ordering Paragraphs 7(g) and 8(a).**

Purpose

In accordance with Ordering Paragraphs (OP or OPs) 7(g) and 8(a) of Decision (D.)19-09-027 (Decision), Pacific Gas and Electric Company (PG&E), Southern California Gas Company (SoCalGas), Southern California Edison Company (SCE), and Center for Sustainable Energy® (CSE) (collectively, SGIP Program Administrators or PAs) resubmit to the California Public Utilities Commission (CPUC or Commission) this Joint Tier 2 Advice Letter (Joint AL) to address the implementation of a price cap[1] on residential storage systems receiving SGIP Equity Budget incentives.

Background

D.19-09-027 was issued on September 18, 2019. On August 12, 2020, SoCalGas, on behalf of the SGIP PAs, requested an extension of time to submit a Tier 2 Advice Letter to comply with OP 8(a) of D.19-09-027. On September 2, 2020, a 180-day extension of time to comply with OP 8(a) of D.19-09-027 was granted by Michelle Cooke on behalf of Alice Stebbins, the CPUC's Executive Director at the time. The extended date for submittal was March 17, 2021. On March 16, 2021, PG&E, on behalf of the SGIP PAs,

[1] "Price cap" and "cost cap" are assumed herein to mean the same thing and are terms often used interchangeably in this document to mean the limit on eligible project costs.

submitted the Joint AL [2], "*Proposal for Self-Generation Incentive Program (SGIP) Residential Price Cap in Accordance with Decision 19-09-027, Ordering Paragraphs 7g and 8a*" (Initial Proposal).

On February 1, 2022, the Energy Division issued a Disposition Letter highlighting deficiencies in the Joint AL and requiring that the SGIP PAs work with Commission staff to submit a new Advice Letter to meet the requirements of D.19-09-027. This Disposition Letter further clarified that the SGIP PAs should determine if it is *feasible* to implement a price cap on residential storage systems receiving SGIP equity budget incentives, instead of commenting on the *necessity* of a cap, as outlined in the SGIP PAs Initial Proposal. Specifically, in Attachment 1 to the Disposition Letter, "*Staff Technical Review and Disposition*", the Commission directed the SGIP PAs to work with Commission staff to determine the following:

1. If it is feasible to implement a price cap on residential storage systems receiving SGIP equity budget incentives;
2. If there should be any exceptions to such an approach;
3. How to address longer duration batteries; and
4. Other issues about how to implement such a cap

<u>Summary of Previous Research Included in the Initial Proposal</u>

D.19-09-027 explains that in the California Solar Initiative (CSI) program for solar photovoltaic (PV) projects the Commission adopted a "soft cap" on the price of a PV system to protect the interests of consumers and ratepayers funding the program. That cap was based on publicly available CSI program cost data and offered some allowances for costs that exceeded the cap if necessary.[3] Similarly, the Commission expressed interest in exploring a price cap in SGIP for energy storage projects and directed the SGIP PAs to work with Commission staff to determine if a price cap in the program was feasible.

Specifically, OP 7(g) of the Decision ordered:

> Pacific Gas and Electric Company, Southern California Edison Company, Southern California Gas Company and the Center for Sustainable Energy (collectively program administrators) shall:
>
> > g. Work with Commission staff to determine if it is feasible to implement a price cap on residential storage systems receiving SGIP equity budget incentives, if there should be any exceptions to such an approach, how to

[2] Joint Advice Letter PG&E 4402-G/6118-E, CSE 122-E, SCE 4441-E, and SoCal Gas 5779-G. , "Proposal for Self-Generation Incentive Program (SGIP) Residential Price Cap in Accordance with Decision 19-09-027, Ordering Paragraphs 7g and 8a" (Initial Proposal). March 16, 2021.
[3] D.19-09-027, p. 39.

> address longer duration batteries, and other issues about how to implement such a cap.

In addition, OP 8(a) of the Decision states:

> Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), Southern California Gas Company (SoCalGas) and the Center for Sustainable Energy (CSE) are authorized to:
>
> > a. Submit a proposal for a Self-Generation Incentive Program residential price cap as outlined in Ordering Paragraph 7(g) in a Tier 2 advice letter within one year of issuance of this decision.[4]

Within the Initial Proposal, the SGIP PAs presented a summary of an analysis prepared by Verdant, the SGIP's third-party Measurement and Evaluation (M&E) contractor that develops SGIP's annual M&E reports, examining the distribution of project costs normalized by system size (in kilowatt-hours).[5] Based on Verdant's findings, the SGIP PAs concluded that there was limited evidence of intentional price inflation by developers and that some price differences could be the result of other factors, such as different labor market costs in different geographic regions.[6] The SGIP PAs did not recommend implementing a price cap in the program at that time.

<u>New Research to Address Feasibility and Other Questions</u>

To specifically address the question of feasibility: <u>the SGIP PAs believe it is feasible to implement a cost cap in SGIP</u>. This is supported by the fact that cost caps have been implemented in other programs, such as the CSI program. Additionally, for this Joint AL, the SGIP PAs also discuss alternate methods of providing consumer and ratepayer protections. Thus, the SGIP PAs took 1) an analytical approach to address feasibility and reasonableness specific to a traditional cost cap mechanism utilizing Verdant's findings, as well as 2) an analysis conducted in consultation with Energy Division to help identify alternative approaches to providing consumer information and protection.

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[4] *Ibid* at OP 8(a).

[5] The PAs note that although OP 7(g) identified systems receiving 'equity budget' incentives, as distinguished from Equity Resiliency or General Market incentives, there were not enough paid Equity Budget projects to provide statistically significant data for the Verdant analysis. That analysis leveraged the universe of paid General Market and Equity Resiliency paid projects.

[6] Joint AL; "*Proposal for Self-Generation Incentive Program (SGIP) Residential Price Cap in Accordance with Decision 19-09-027, Ordering Paragraphs 7g and 8a*" (Initial Proposal). March 16, 2021

Market and linear regression analyses performed by Verdant

A cost cap could protect ratepayers[7] by avoiding project inflation that might otherwise result from project developers capitalizing on very lucrative SGIP incentive rates by preventing the program from over-paying projects. A cost cap can also establish guideposts to incentivize reasonable project costs that are aligned with expected market conditions. An initial exploration of this concept required an analysis of SGIP project cost data, recent trends, as well as an assessment of California and national storage costs to help inform a data-supported cost cap in SGIP, should one be implemented.

The SGIP PAs worked with Verdant to conduct a more in-depth examination into the original analysis completed to support the PAs' Initial Proposal (Verdant Report). Verdant analyzed a variety of statewide and national data from EnergySage, Lazard, National Renewable Energy Laboratory (NREL), Lawrence Berkeley National Labs (LBNL), and information from specific manufacturers.[8] The Verdant Report is found in Attachment 1.

Market Data

For their market assessment, Verdant's analysis demonstrated several important findings:

a. Nationwide: With increased deployment of energy storage technologies, rather than seeing a decrease in costs, the average energy storage costs have been increasing. Median storage pricing has increased approximately 14% nationally from $1.128/Wh in Q3 2020 to $1.289/Wh in Q4 2021.[9]
b. Statewide: California's cost data suggests a second-half 2021 median storage price of approximately $1.29/Wh.[10]
c. SGIP Specific: SGIP has seen a 15% increase in small residential project costs (by developer/manufacturer) from 2020 to 2021, from $1.05/Wh to $1.21/Wh.[11]
d. SGIP Longer Duration Storage: For Large-Scale Storage (residential only) with longer duration, eligible costs increased 11% from 2020 to 2021. These costs have increased from $0.98/Wh to $1.09/Wh.[12]
e. Overall: There is a general upward trend in pricing across categories in SGIP from 2020 to 2021 as well as in most other states.[13]

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[7] Ratepayers are distinguished here because SGIP is a ratepayer-funded incentive program. While not all ratepayers are SGIP customers, it is the responsibility of the SGIP PAs to manage ratepayer funding efficiently. Customers – ratepayers who participate in SGIP – also can benefit from a cost cap and will be addressed in the next section.
[8] Energy Sage and Lazard are third-party websites that house energy cost data.
[9] Verdant Report, Slide 10.
[10] Verdant Report, Slide 11.
[11] Verdant Report, Slide 7.
[12] Verdant Report, Slide 9.
[13] As a reminder, and for comparison: SGIP incentive rates are as follows: Equity Resiliency - $1.00/Wh; Equity Budget - $0.85/Wh; General Market Residential - $0.15 - $0.20/Wh depending on PA; General Market Non-Residential - $0.25 - $0.30/Wh depending on PA.

CSI Cost Cap Model

To offer perspective on what is feasible, Verdant also provided background on the CSI program, as a potential model. The CSI cost cap includes the following:

- A rolling 12-month simple mean soft cost cap,[14] updated weekly, based on CSI data.
- National data considered on an annual basis to revise the cap as necessary.
- Differentiation by size category and excluding third-party owned systems.
- Customers provide justification for the higher costs via a signed High-Cost Justification and Acknowledgement Form when necessary.

Regression Analysis

For its regression analysis, Verdant built several linear models with the dependent variable being total eligible cost by dollar per watt hour ($/Wh). Independent variables included:

- System size (kWh)
- Program Administrator
- Budget Category
- Equipment Manufacturer / Developer Combination
- Investor-Owned Utility Territory

The analysis included only PY 2020 and PY 2021 projects that received incentives.

Overall, Verdant's conclusions from the regression analysis and market data analysis (above) are as follows:

1) Regression analysis predicts that, using only small residential coefficients, the Equity Resiliency costs are $0.99/Wh.[15] This very nearly corresponds to the current incentive for Equity Resiliency of $1.00/Wh.
2) Based on lessons learned from the CSI program, an incentive program cost cap is feasible using a rolling 12-month average of eligible costs.
3) Any development of a program cost cap should be specific to each budget category and manufacturer given the variations in observed project costs.
4) Regardless of a firm program cost cap, the total eligible project costs should continue to be the not-to-exceed incentives provided for any given project, particularly in the Equity and Equity Resiliency budgets where the $/kWh incentive rate may exceed the total eligible project costs in the absence of this firm per-project limitation.

[14] A soft cost cap is the limit on eligible project costs but can be exceeded as long as the developer provides an explanation, and the customer acknowledges and signs a justification form.
[15] Attachment 1 - Verdant Cost Cap Analysis at 17.

5) Any development of a programmatic soft cost cap should include a signed Justification and Acknowledgement Form from the customer and project developer to justify higher system costs.
6) Special consideration should be given to longer duration storage projects, which have historically applied to the Large Scale budget categories, by implementing a soft cost cap specific to each SGIP budget category. This would capture the nuances of longer duration storage costs relative to the costs of shorter 2 to 4-hour duration systems in either the residential or equity resiliency budgets.
7) It may be necessary to monitor deviations from current sizing expectations. Residential-Large Scale storage projects have averaged 41-42 kWh; going forward, if systems deviate significantly from this size, it may be necessary to create separate size categories for the cost cap.
8) Flexibility in any cost cap development will also remain important. The SGIP PAs should have the authority to evaluate and adjust cost cap calculations on an annual basis. These evaluations should include both SGIP data as well as assumptions from other external sources (e.g., EnergySage, Lazard).

As outlined herein, the SGIP PAs do find that a cost cap is feasible. Furthermore, considering the above information from Verdant, should the Commission deem a program cost cap reasonable to implement, it may also be feasible to collect California and national energy storage cost data to construct a simple mean cost cap in SGIP along the lines of how CSI implemented a similar cost cap mechanism. Data could be differentiated by budget category, project size, and longer duration storage. To take advantage of lessons learned from CSI, SGIP could similarly engage with storage vendors and experts in the field to optimize their experience with developing a cost cap methodology.

Any implementation of a cost cap should also take into consideration time and administrative budget impacts. These impacts should be evaluated against the consumer protection benefits that could be gained through implementation of a cost cap. A more thorough evaluation of these costs and benefits should be conducted to determine if such an undertaking is recommended by the Commission.

SGIP PA and Energy Division Collaboration

The Verdant analysis addressed feasibility of implementing a cost cap by looking at SGIP costs and external market data, anchoring the analysis on current costs, and whether they are increasing, decreasing or staying the same.

Additionally, the PAs also worked with Energy Division Staff to evaluate other possible solutions to customer information asymmetry (i.e., customer lack of information/knowledge as compared to project developers). A goal of the SGIP PAs is to provide a program with transparent consumer protections in place to make certain that customers are well informed of market expectations and do not unnecessarily overpay for projects. These basic ratepayer goals should continue to be evaluated regardless of a decision specific to the development of a program cost cap. The SGIP PAs and Energy

Division staff worked together to produce recommendations for supporting SGIP customers that could reduce information asymmetry and help each SGIP customer through the decision-making process.

Matrix

The SGIP PAs and Energy Division constructed a matrix that analyzed specific Alternative Solutions to reduce customer information asymmetry in SGIP regarding project costs. The Alternative Solutions explored included:

a. Business as Usual (BAU): No changes made to the existing program.
b. Residential Cost Cap (hard): Set a "not-to-exceed" cap for the $/Wh that can be charged for residential storage projects.
c. Residential Cost Cap (soft): Set a cap for the $/Wh but allow developers, when necessary, to provide a justification for increased costs and have host customers sign a Justification Form attesting they have been informed that their project costs are above the cap.
d. Reduce incentive level in the Equity Budget/Equity Resiliency Budget: Reduce the incentive rates for the Equity Budget and Equity Resiliency Budget to better align with anticipated system costs.
e. Bidding Best Practices Sign-off: Inform customers of accepted best practices for soliciting bids from contractors and requiring customers sign a declaration confirming they have considered these best practices.
f. Collate Residential Cost Resources: Produce a "how-to" guide on navigating the energy storage installation process, including what to look for in bids, how to vet contractors, and providing links to helpful websites to enable customers to perform their own research.
g. Share Market Cost Comparisons: Inform customers how their project costs compare to similar local project costs (e.g., "Your project costs are lower than X% of similar projects in your area.").

Aside from BAU, there are two basic groupings: 1) alternatives that provide customers *educational resources* to promote good decisions (items e, f, and g); and 2) *program incentive design changes* such as a soft or hard cap or incentive reduction (items b, c, and d).

After identifying the possible Alternative Solutions, the SGIP PAs and Energy Division then developed new *Indices of Performance* to use for ranking each of the new Alternative Solutions, as follows:

a. Cost (lowest to highest)
b. Implementation Timeframe (shortest to longest)
c. Unintended Consequences (least to most)
d. Effectiveness (most to least)
e. Flexibility (most to least)

Next, each PA, with input from the SGIP database provider Energy Solutions (on potential development and cost impacts), ranked each Alternative Solution considering the above Indices. The summary of these evaluations highlighted the following:

- First, BAU, while the easiest with least cost implications, was not the preferred approach as it would fail to provide any additional consumer and/or ratepayer protection as mentioned above.
- Second, the educational resources were generally deemed easier, less costly and faster to implement. Sharing market cost comparisons, other cost resources and getting customer sign-off on their bids would likely benefit ratepayers and SGIP customers quickly. Furthermore, it was determined that a Share Market Cost Comparison approach would most directly address concerns regarding customer information asymmetry.
- Third, program changes, such as implementing a soft cost cap, are feasible and potentially desirable but harder to implement and take more time than providing educational resources. Additionally, of the program changes, the residential soft cost cap would establish a standard market-based project cost cap without the inflexibility of other solutions that may fail to account for more complex projects that may reasonably exceed what is considered a standard cost cap for more routine installations.

Summary of Conclusions

1. ***Is it feasible to implement a price cap on residential storage systems receiving SGIP equity budget incentives?***
   Instituting a price cap (i.e., soft cost cap per budget category) is feasible and could be considered. Other similar programs have instituted some version of a cost cap. The CSI program, as an example, implemented a similar mechanism using a rolling 12-month average of eligible costs. This approach could also be specific to each SGIP budget category to address variations in project costs (as observed by Verdant).[16]

2. ***Should there be any exceptions to such an approach?***
   Should a cost cap be considered, the PAs recommend a soft cost cap that could allow exceptions for more complex project installations, while remaining in the spirit of promoting consumer protection. Furthermore, the PAs recommend consideration also be given to the Alternative Solutions as presented above to provide program transparency and further address issues related to customer information asymmetry.

3. ***How to address longer duration batteries?***
   Implementing a soft cost cap, specific to each SGIP budget category, would help address issues specific to longer duration batteries (e.g., the difference in the cost

[16] Verdant Report, Slide 19.

per Wh for longer duration batteries as compared to shorter duration batteries). Longer duration battery projects are predominantly found in the Large-Scale Storage budget thus a soft cost cap specific to this budget would appropriately isolate and specifically account for such issues. It may also be possible to provide market cost comparisons for longer duration batteries (i.e., 4 to 6 hours) separately from the shorter, generally 2-hour battery comparisons.

4. ***Other issues about how to implement such a cap.***
   Specific to the question of developing a cost cap, the PAs believe implementing a soft cost cap would provide consumer protection while maintaining PA flexibility in approving high cost justifications for more complex projects. Furthermore, this solution could also be developed concurrently with the easier-to-implement recommendations, such as a Share of Market Cost Comparisons or other consumer educational resources that can quickly address the problem of customer information asymmetry described above.

This analysis fulfills the requirements of D.19-09-027, OPs 7(g) and 8.(a).[17]

The PAs, in support of the conclusions contained herein, enclose Verdant's SGIP Cost Cap Analysis for reference at Attachment 1.

Protests

Anyone wishing to protest this submittal may do so by letter sent via E-mail no later than April 25, 2022, which is 21[18] days after the date of this submittal. Protests must be submitted to:

CPUC Energy Division
ED Tariff Unit
E-mail: EDTariffUnit@cpuc.ca.gov

Copies of protests also should be mailed to the attention of the Director, Energy Division, Room 4004, at the address shown above.

The protest shall also be sent to the SGIP PAs via E-mail on the same date it is emailed to the Commission:

For PG&E:

Sidney Bob Dietz II
Director, Regulatory Relations
c/o Megan Lawson
E-mail: PGETariffs@pge.com

[17] D.19-09-027, P. 128.
[18] PG&E is moving this date to the following business day because the 20-day protest period concludes on a weekend.

For CSE:

Sephra Ninow
Director, Regulatory Affairs
E-mail: sephra.ninow@energycenter.org

For SCE:

Shinjini C. Menon
Managing Director, Statewide Regulatory Operations
E-mail: AdviceTariffManager@sce.com
And
Tara Kaushik
Managing Director, Regulatory Relations
c/o Karyn.Gansecki@sce.com

For SoCalGas:

Gary Lenart
Regulatory Tariff Manager
E-mail: GLenart@socalgas.com
E-mail: Tariffs@socalgas.com

Any person (including individuals, groups, or organizations) may protest or respond to an advice letter (General Order 96-B, Section 7.4). The protest shall contain the following information: specification of the advice letter protested; grounds for the protest; supporting factual information or legal argument; name, telephone number, postal address, and (where appropriate) e-mail address of the protestant; and statement that the protest was sent to the utility no later than the day on which the protest was submitted to the reviewing Industry Division (General Order 96-B, Section 3.11).

Effective Date

PG&E requests that this Tier 2 advice submittal become effective on regular notice, May 4, 2022**,** which is 30 calendar days after the date of submittal

Notice

In accordance with General Order 96-B, Section IV, a copy of this advice letter is being sent electronically to parties shown on the attached list and the parties on the service list for R.20-05-012. Address changes to the General Order 96-B service list should be directed to PG&E at email address PGETariffs@pge.com. For changes to any other service list, please contact the Commission's Process Office at (415) 703-2021 or at Process_Office@cpuc.ca.gov. Send all electronic approvals to PGETariffs@pge.com. Advice letter submittals can also be accessed electronically at: http://www.pge.com/tariffs/.

/S/

Sidney Bob Dietz II
Director, Regulatory Relations

Attachments: SGIP Cost Cap Analysis

cc: Service List R.20-05-012

California Public Utilities Commission

ADVICE LETTER SUMMARY

ENERGY UTILITY

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

Company name/CPUC Utility No.: Pacific Gas and Electric Company (U 39 M)

Utility type:
- [x] ELC
- [x] GAS
- [ ] WATER
- [ ] PLC
- [ ] HEAT

Contact Person: Stuart Rubio
Phone #: (415) 973-4587
E-mail: PGETariffs@pge.com
E-mail Disposition Notice to: SHR8@pge.com

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

(Date Submitted / Received Stamp by CPUC)

Advice Letter (AL) #: 4593-G/6553-E

Tier Designation: 2

Subject of AL: Revised Proposal for Self-Generation Incentive Program (SGIP) Residential Price Cap in Accordance with Decision 19-09-027, Ordering Paragraphs 7(g) and 8(a).

Keywords (choose from CPUC listing): Compliance, Self Generation

AL Type: [ ] Monthly [ ] Quarterly [ ] Annual [x] One-Time [ ] Other:

If AL submitted in compliance with a Commission order, indicate relevant Decision/Resolution #:
D.19-09-027

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 [x] 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 [x] No

Requested effective date: 5/4/22

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: N/A

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

California Public Utilities Commission Energy Division Tariff Unit Email: EDTariffUnit@cpuc.ca.gov	Contact Name: Sidney Bob Dietz II, c/o Megan Lawson Title: Director, Regulatory Relations Utility/Entity Name: Pacific Gas and Electric Company Telephone (xxx) xxx-xxxx: (415)973-2093 Facsimile (xxx) xxx-xxxx: Email: PGETariffs@pge.com
	Contact Name: Title: Utility/Entity Name: Telephone (xxx) xxx-xxxx: Facsimile (xxx) xxx-xxxx: Email:

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

Clear Form

SGIP COST CAP ANALYSIS

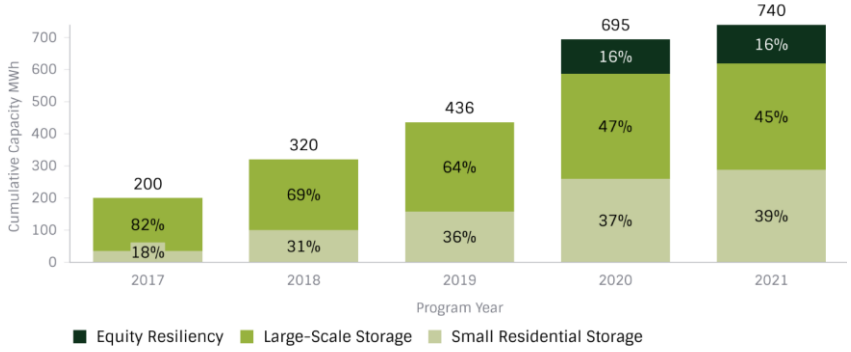
March 21, 2022

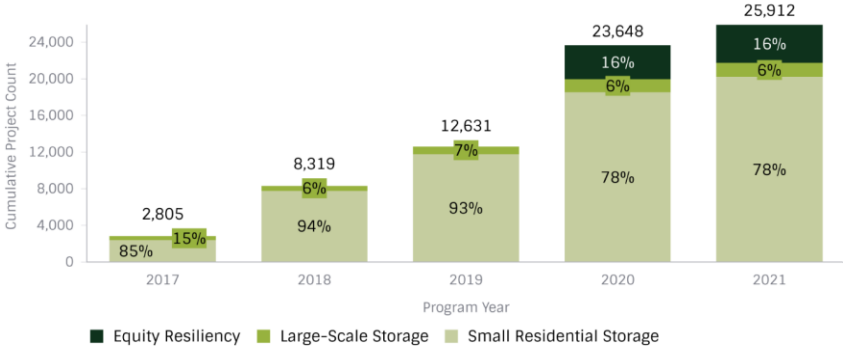
VERDANT

OVERVIEW OF SGIP DATA USED IN COST ANALYSIS

By Budget Category and Program Year

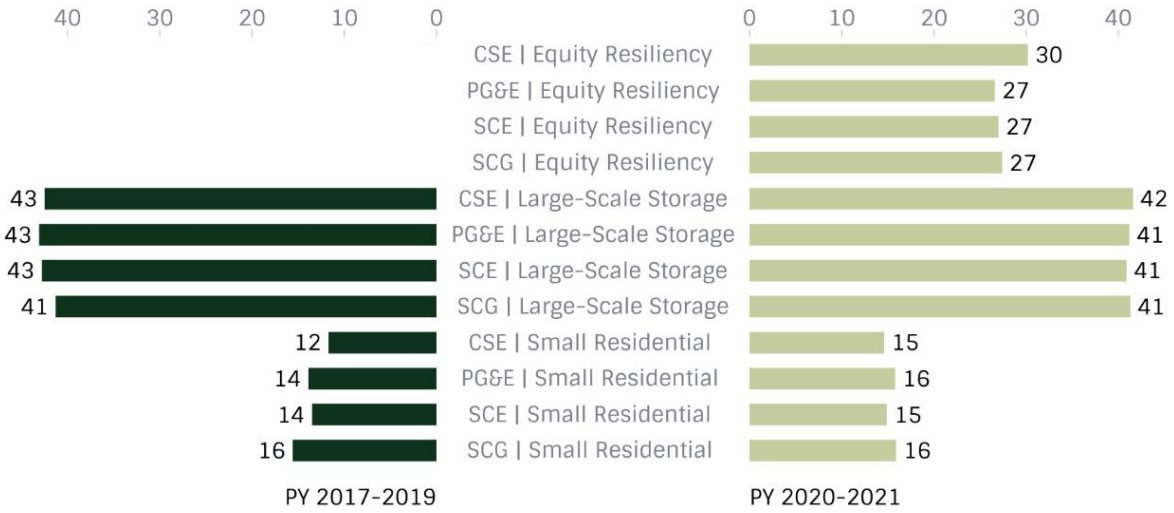
- Data pulled from SGIP statewide project list
- Includes all residential energy storage projects:
  - Applying to the program beginning PY 2017
  - Received upfront payment prior to 1.1.2022





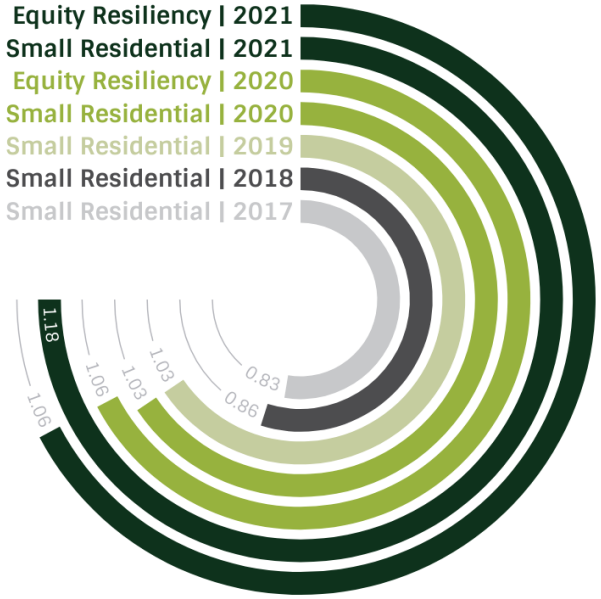
AVERAGE CAPACITY (KWH)

By Program Administrator, Budget Category, and Program Year

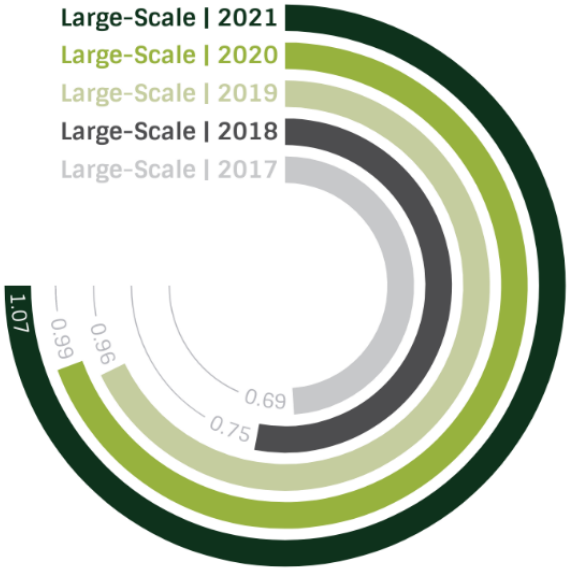


ELIGIBLE COST BY BUDGET CATEGORY

Small Residential and Equity Resiliency

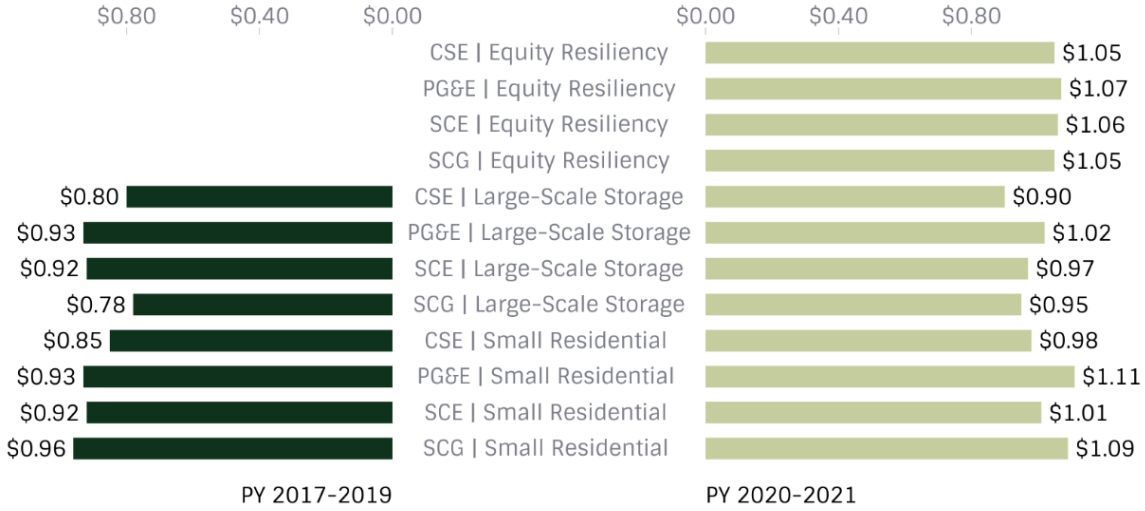


Long Duration/Large-Scale Residential



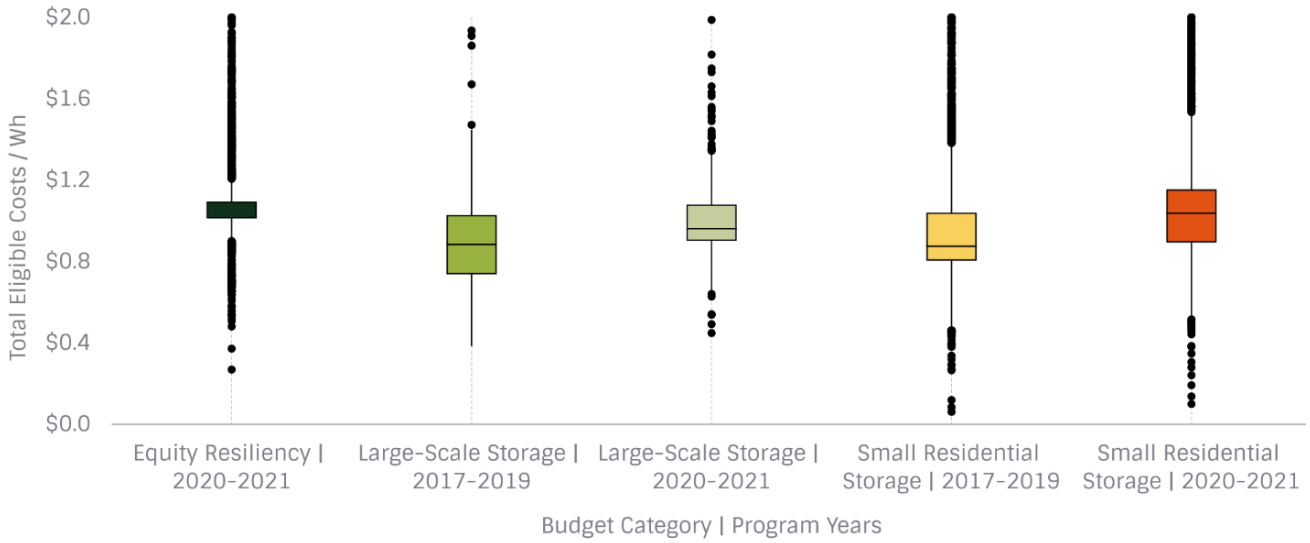
ELIGIBLE COST BY PROGRAM ADMINISTRATOR

Small Residential, Equity Resilience, and Large-Scale Residential



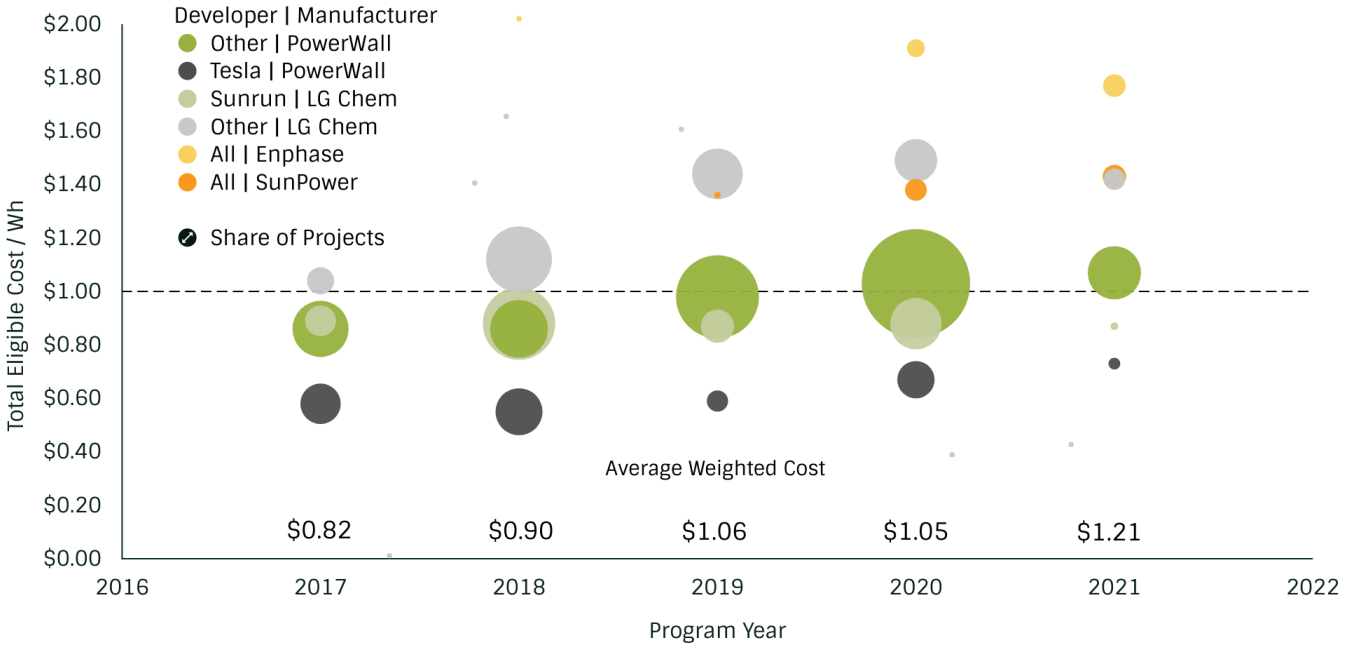
ELIGIBLE COST BY BUDGET CATEGORY

Distribution of Eligible Costs



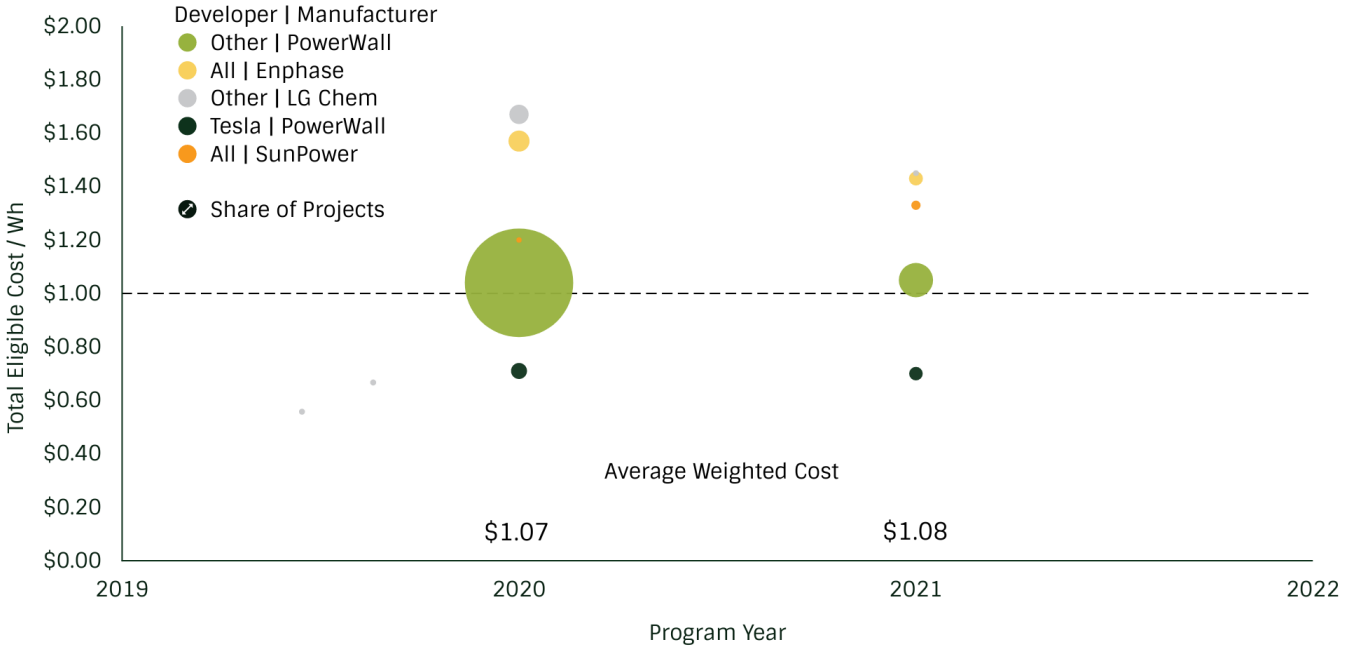
SMALL RESIDENTIAL ELIGIBLE COST

By Developer/Manufacturer Combination and Program Year



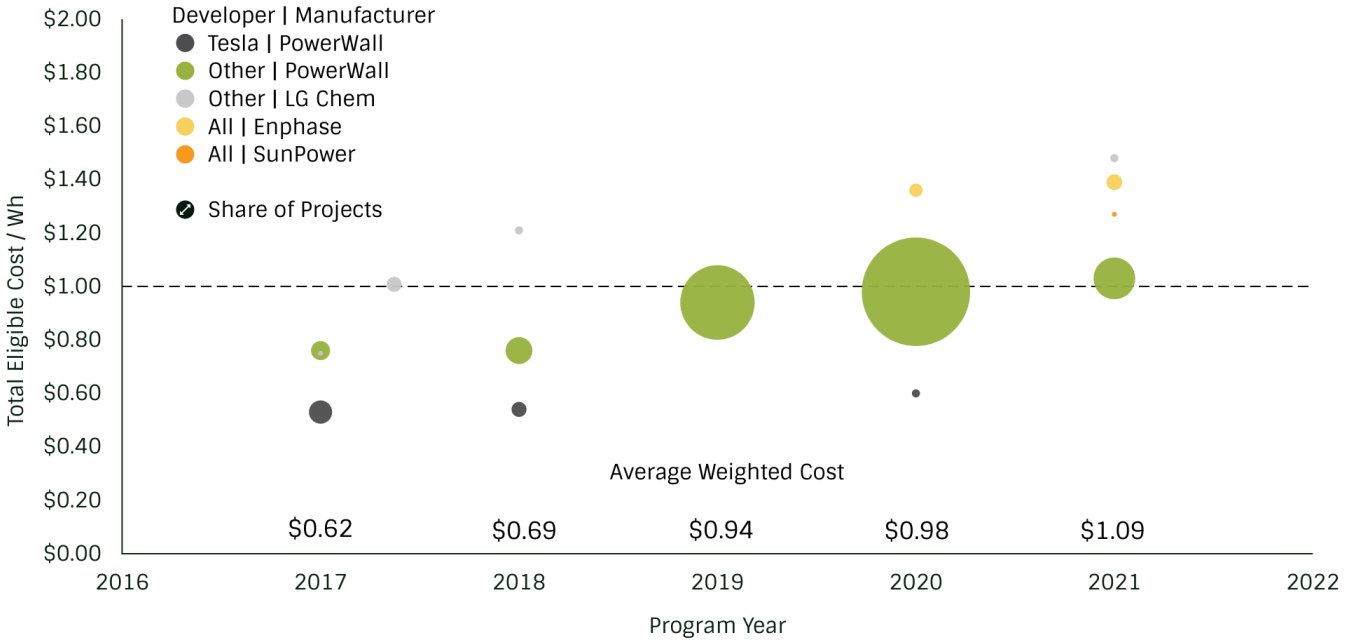
EQUITY RESILIENCY ELIGIBLE COST

By Developer/Manufacturer Combination and Program Year



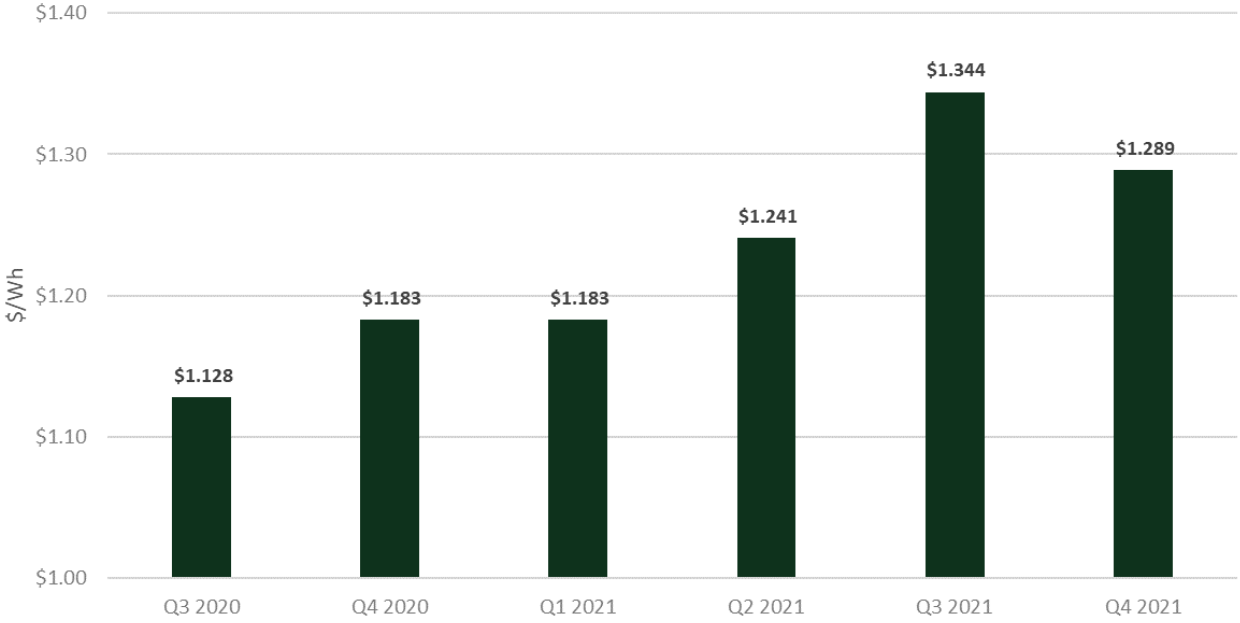
LARGE-SCALE STORAGE (RES ONLY) ELIGIBLE COST

Long Duration Storage By Developer/Manufacturer Combination and Program Year



COST DATA FROM OUTSIDE SGIP

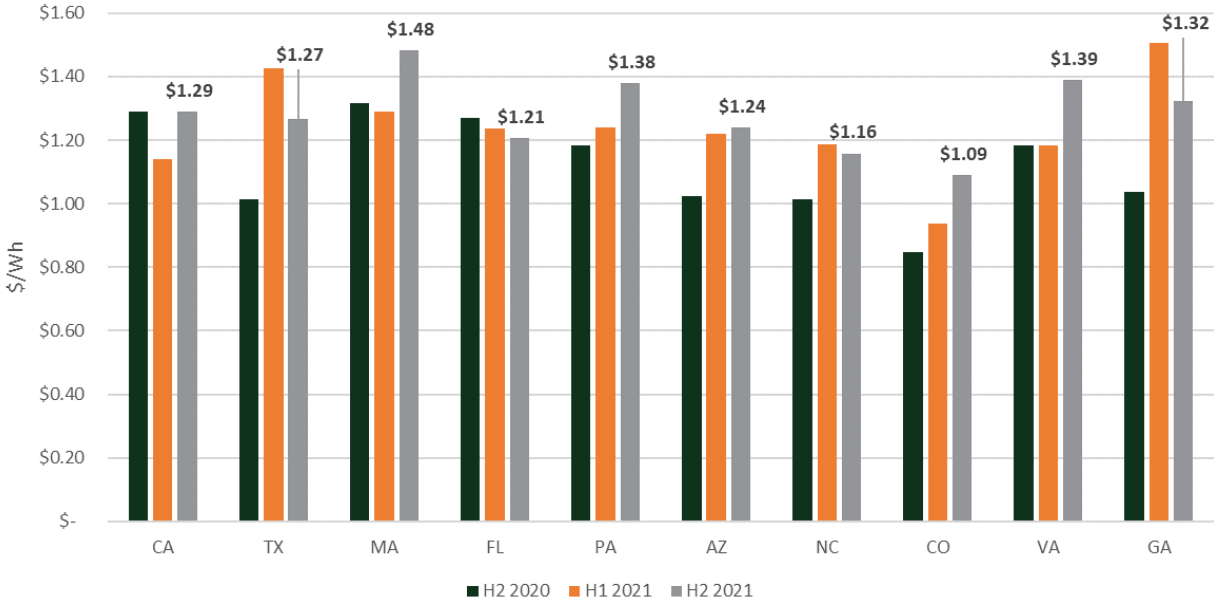
Energy Sage Solar Market Intel Report, Median Storage Pricing (National Average)



Adapted from EnergySage Solar Marketplace Intel Report
https://www.energysage.com/data/#intel-14

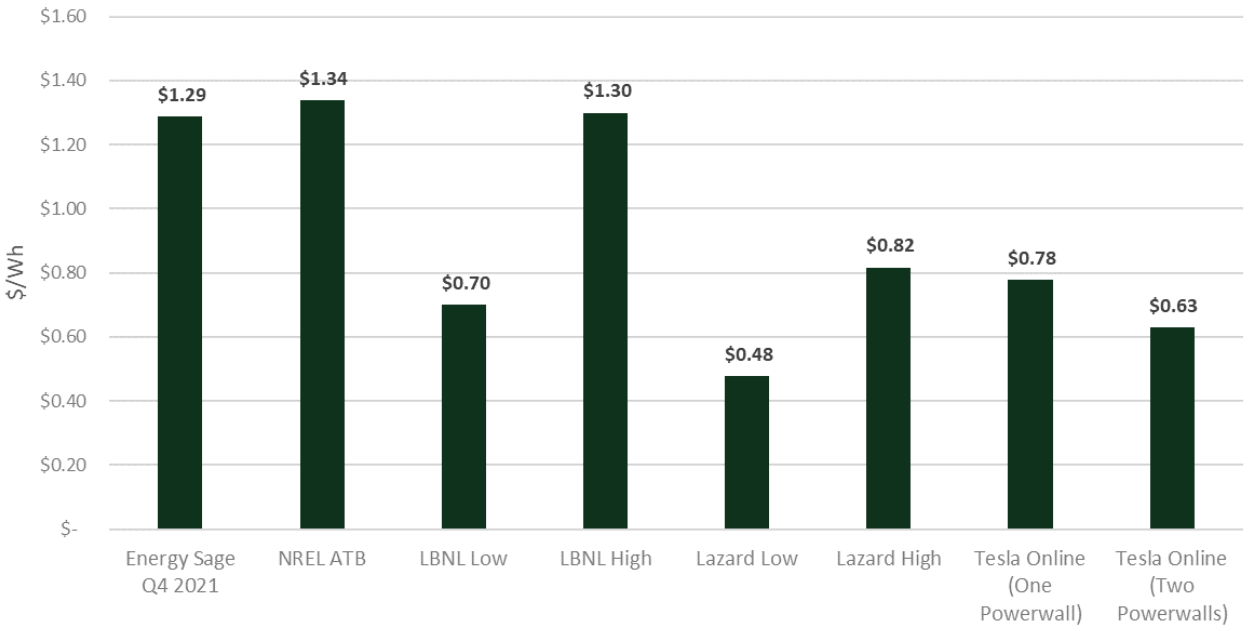
COST DATA FROM OUTSIDE SGIP

Energy Sage Solar Market Intel Report, Median Storage Pricing by State



Adapted from EnergySage Solar Marketplace Intel Report

COST DATA FROM OUTSIDE SGIP



See appendix slides for references.

UNCERTAIN PATH FORWARD

Recalls, supply chain constraints, inflation

IHS Markit: Battery prices won't fall until 2024

Business data analyst IHS Markit published a series of clean tech predictions for the year that also highlighted the rising proportion of sub-5MW solar projects in the global market, and cheaper clean energy financing costs even as panel prices continue to rise.

MARCH 7, 2022 MAX HALL

TECH

Elon Musk says Tesla Powerwall production lagging due to chip shortage

PUBLISHED TUE, JUL 13 2021•5:09 PM EDT | UPDATED TUE, JUL 13 2021•6:48 PM EDT

Lora Kolodny
@LORAKOLODNY

SHARE

Fire hazard leads to further product recall for LG residential battery storage systems

By Andy Colthorpe

August 9, 2021

EXAMPLES FROM OTHER PROGRAMS

California Solar Initiative (CSI) Soft Cap

"… Projects applying and installing PV systems through this program should have their installed cost fall within a reasonable limit. The current average cost of PV systems ranges from $7.36 to $8.41 per CEC-AC Watt, fully installed. To ensure that the integrity of the program is maintained, the PAs will require documentation for why system cost exceeds the limit displayed at www.CaliforniaSolarStatistics.ca.gov."

- Calculated using a rolling twelve-month simple mean, updated weekly, based on CSI data.
- National data shall be considered on an annual basis and the methodology revised as needed.
- Differentiated by size category and excluded third party owned systems.
- If the system cost exceeds the soft cost cap, the customer is required to sign the High-Cost Justification and Acknowledgement Form.

EXAMPLES FROM OTHER PROGRAMS

Solar on Multifamily Affordable Housing (SOMAH) Incentive Stepdown

"… incentive levels will decrease by the annual percent decline in residential solar costs as reflected by NREL reports, or 5% annually, whichever is less. … we find that this calculation method will ensure that annual incentive reductions reflect changes to actual market costs, while not declining too much in any given year. This incentive step-down methodology will be reviewed and may be changed in the 2020 program evaluation, if appropriate based on further cost or market information."

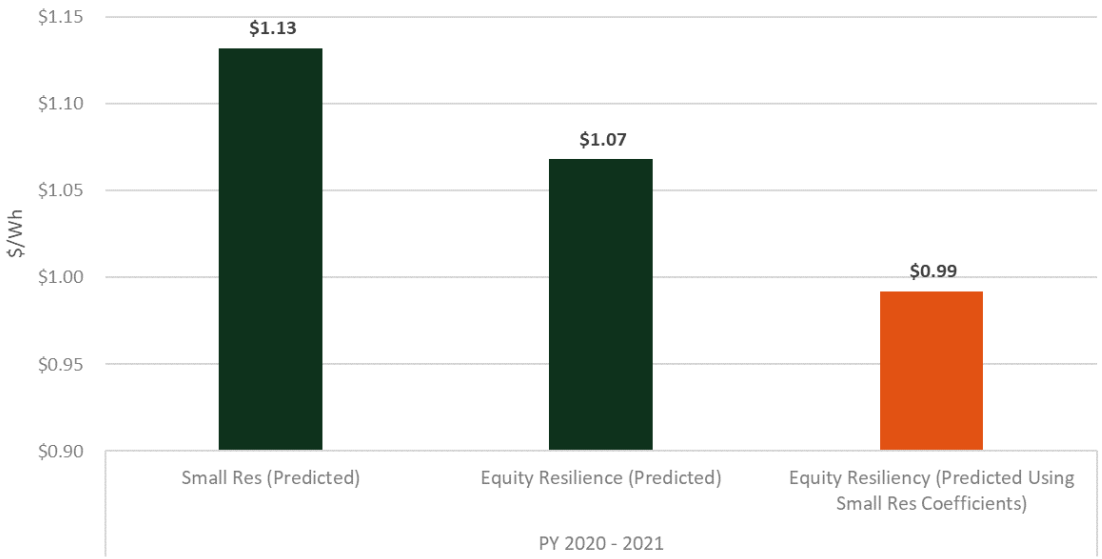
- Delays in releasing NREL reports have caused the SOMAH PAs to request extensions to the step-down
- Process most recently led to a 2% reduction in incentives
- SOMAH is not a market transformation program
- Methodology is at odds with current small residential incentive step down structure. Also assumes prices are declining.

REGRESSION MODELING

- Built several linear models, dependent variable is total eligible cost $/Wh
- Independent variables include:
  - System size (kWh)
  - PA
  - Budget Category
  - Equipment Manufacturer / Developer Combination
  - Utility Region
- Include only PY 2020 and PY 2021 projects that have received incentives

REGRESSION RESULTS

Predicting equity resilience costs using small residential coefficients



REGRESSION MODELING

Focus on Powerwall systems installed by third parties

» Filter model input data to include only Tesla Powerwall systems installed by developers that are not Tesla

» **We find that Powerwall systems installed by non-Tesla developers in the equity resiliency budget are between 6.5 and 9.8 cents per Watt-hour higher in cost relative to those installed in the small residential budget category (90% confidence).**

- Model controlled for battery size. Equity resiliency systems are larger; thus, they tend to cost less on a $/Wh basis because the impact of size is greater than the impact of budget category.

COST CAP CONSIDERATIONS

Is a residential cost cap feasible?

- **Yes**, a residential cost cap is feasible. It would be possible to implement a soft cost cap, similar to the CSI Program implementation, using a rolling 12-month average of eligible costs.
  - The cost cap could be specific to each budget category and manufacturer, given the variations in observed project costs
- The total eligible cost would continue to be the hard cap on incentives, particularly in the equity and equity-resiliency budgets, where incentives may be greater than total costs
- If the system cost exceeds the soft cost cap, the customer may be required to sign a justification and acknowledgement Form

COST CAP CONSIDERATIONS

Long duration storage

- Longer duration storage projects have historically applied to the large-scale budget category. Imposing a soft cost cap by budget category would capture the nuances of long duration storage costs relative to 2–4-hour systems in the residential general market and equity resiliency budgets.

- To date, residential large scale storage projects have averaged 41-42 kWh (approximately three Powerwall systems). Going forward, if systems deviate significantly from this size, it may be necessary to create separate size categories for the cost cap.

- The PAs could reserve the right to modify cost cap calculations on an annual basis, including by incorporating data from outside the program.

THANK YOU

VERDANT

REFERENCES

Cost data from outside SGIP

- NREL Annual Technology Baseline. https://atb.nrel.gov/electricity/2021/residential_battery_storage
  - Storage $/Wh derived from Storage Only cost ($18,740) divided by 14 kWh

- LBNL Behind-the-Meter Solar + Storage: Market data and trends. July 2021. https://eta-publications.lbl.gov/sites/default/files/btm_solarstorage_trends_final.pdf
  - Slide 25: *"Incremental cost of adding storage to PV ~$1,000/kWh$_{storage}$ ($700-1,300/kWh across sources; wider spread across individual projects)."*

REFERENCES

Cost data from outside SGIP

» Lazard's Levelized Cost of Storage Analysis – Version 7.0.
https://www.lazard.com/media/451882/lazards-levelized-cost-of-storage-version-70-vf.pdf

- Adapted from slide 15

	Low	High
Power	6 kW	6 kW
Usable Energy	25 kWh	25 kWh
Capital Cost DC	$454/kWh	$780/kWh
Capital Cost AC	$97/kW	$154/kW
Total Cost $	$11,932	$20,424
Total Cost $/Wh	$0.48	$0.82

REFERENCES

Cost data from outside SGIP

» Tesla Powerwall Website: https://www.tesla.com/energy/design

- Accessed March 9, 2022
- Quoted 1x and 2x Powerwall systems for a home located in Davis, CA

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

AT&T
Albion Power Company

Alta Power Group, LLC
Anderson & Poole

Atlas ReFuel
BART

Barkovich & Yap, Inc.
Braun Blaising Smith Wynne, P.C.
California Cotton Ginners & Growers Assn
California Energy Commission

California Hub for Energy Efficiency Financing

California Alternative Energy and Advanced Transportation Financing Authority
California Public Utilities Commission
Calpine

Cameron-Daniel, P.C.
Casner, Steve
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

East Bay Community Energy Ellison Schneider & Harris LLP
Engineers and Scientists of California

GenOn Energy, Inc.
Goodin, MacBride, Squeri, Schlotz & Ritchie
Green Power Institute
Hanna & Morton
ICF
International Power Technology

Intertie

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
McClintock IP
McKenzie & Associates

Modesto Irrigation District
NLine Energy, Inc.
NRG Solar

OnGrid Solar
Pacific Gas and Electric Company
Peninsula Clean Energy

Pioneer Community Energy

Public Advocates Office

Redwood Coast Energy Authority
Regulatory & Cogeneration Service, Inc.
SCD Energy Solutions
San Diego Gas & Electric Company

SPURR
San Francisco Water Power and Sewer
Sempra Utilities

Sierra Telephone Company, Inc.
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
Utility Cost Management
Utility Power Solutions
Uplight
Water and Energy Consulting Wellhead Electric Company
Western Manufactured Housing Communities Association (WMA)
Yep Energy