

**Self-Generation
Incentive Program**

HANDBOOK

*Provides financial incentives for installing
clean, efficient, on-site distributed generation*

February 14, 2020



What's New Self-Generation Incentive Program (SGIP)

The 2020 V2 Handbook has been updated to reflect the following changes:

- **Remove the requirement for the application fee for all residential projects. The application fee is required for Non-Residential projects only.**
 - Reservation Request (§2.3)
 - Required Documentation for Reservation Request (§5.4.1)
 - Required Documentation for Reservation Request (§6.10.1)
- **Remove the requirement that SGIP participants submit a paper copy of the Energy Efficiency Audit. The Host Customer must attest that the EEA has been performed and reviewed.**
 - Required Documentation for Reservation Request (§5.4.1)
 - Required Documentation for Proof of Project Milestone (§5.4.2)
 - Required Documentation for Reservation Request (§6.10.1)
 - Required Documentation for Proof of Project Milestone (§6.10.2)

Updated Legislation and Regulatory Background

Contents

What's New Self-Generation Incentive Program (SGIP)	1
Program Administrator Contact Information.....	8
Program Overview	9
1 Budget.....	10
1.1 Statewide Program Budget and Administrator Allocations	10
1.2 Budget Allocation	10
2 Applications.....	12
2.1 Application Process.....	12
2.1.1 Application Submission	12
2.1.2 Signatures	12
2.1.3 File Retention	13
2.2 Incentive Process Flowcharts	13
2.3 Reservation Request.....	15
2.3.1 Submitting the Reservation Request	15
2.3.2 Lottery Process	15
2.3.3 Pause Period.....	16
2.3.4 Incomplete Reservation Request	16
2.3.5 Approval of Reservation Request	17
2.3.6 Wait List and Program Closure	17
2.4 Proof of Project Milestone	17
2.4.1 Submitting Proof of Project Milestone	18
2.4.2 Incomplete Proof of Project Milestone	18
2.4.3 Approval of Proof of Project Milestone.....	18
2.5 Incentive Claim.....	18
2.5.1 Submitting Incentive Claim.....	19
2.5.2 Incomplete Incentive Claim	19
2.5.3 Inspections	19
2.5.4 Approval of Incentive Claim	20

2.6	Modifications and Extensions.....	20
2.6.1	Modifications Pre-ICF.....	21
2.6.2	Modifications Post-ICF.....	21
2.6.3	Extensions and Exceptions.....	21
3	Incentives.....	23
3.1	Incentive Rates.....	23
3.1.1	Generation Incentive Rates.....	23
3.1.2	Energy Storage Incentive Rates.....	24
3.1.3	Incentives for Technologies from a California Manufacturer.....	25
3.2	Incentive Limitations.....	27
3.2.1	Maximum Incentive Amount.....	27
3.2.2	Total Eligible Project Costs.....	27
3.2.3	Incentive Calculation for Site with Multiple Systems.....	29
3.2.4	Calculating Incentives with Existing Systems.....	29
3.2.5	Calculating Incentives for Replacement Generation.....	29
3.2.6	Incentives from other sources.....	30
3.2.7	Developer Cap.....	30
3.3	PBI Assignment.....	30
4	Program Eligibility.....	32
4.1	Program Participant Criteria.....	32
4.1.1	Host Customer.....	32
4.1.2	System Owner.....	33
4.1.3	Applicant.....	33
4.1.4	Payee.....	34
4.1.5	Developer.....	34
4.2	Equipment Eligibility.....	37
4.2.1	Commercial Availability.....	37
4.2.2	Interconnection.....	38
4.2.3	Permanent Installation.....	38

4.2.4	Ineligible Equipment	39
4.2.5	System Sizing for Projects without Peak Demand Information.....	39
4.2.6	Eligibility for New Technologies	40
4.2.7	Program Modification Guidelines	40
5	Energy Storage Technologies	42
5.1	Rating Criteria for Energy Storage Projects.....	42
5.1.1	Rated Capacity (W)	42
5.1.2	Energy Capacity (Wh)	43
5.2	Incentive Calculation for Energy Storage Projects.....	43
5.2.1	Incentive Declines Based on Storage Duration	43
5.2.2	Incentive Declines and Caps Based on Energy Capacity (Wh).....	44
5.2.3	Performance-Based Incentive Payment (PBI)	44
5.3	Eligibility Requirements for Energy Storage Projects	45
5.3.1	Greenhouse Gas Emission Standards.....	45
5.3.2	System Size Parameters.....	46
5.3.3	Operational Requirements	46
5.3.4	Paired with On-site Renewables	46
5.3.5	Demand Response Dual Participation	46
5.4	Application Documentation Requirements for Energy Storage Projects	46
5.4.1	Required Documentation for Reservation Request	46
5.4.2	Required Documentation for Proof of Project Milestone.....	52
5.4.3	Required Documentation for Incentive Claim	53
5.5	Metering & Monitoring Requirements for Energy Storage Projects	55
5.5.1	Minimum Electrical Meter Requirements	56
6	Generation Technologies.....	58
6.1	Operational Eligibility Requirements for Projects Operating on Blended Fuel	58
6.1.1	Minimum Operating Efficiency Requirements	58
6.1.2	NOx Emission & Minimum System Efficiency Standards	59
6.1.3	Greenhouse Gas Emission Standards.....	61

6.1.4	Reliability Criteria	62
6.1.5	Rating Criteria for System Output	62
6.2	Capacity Factors	63
6.3	Operational Eligibility Requirements for Renewable Technologies and Generation Projects Operating on 100% Renewable Fuel	64
6.3.1	Rating Criteria for System Output of Renewable Technologies	64
6.4	Sizing Requirements for all Generation Systems	64
6.4.1	System Sizing for Wind Turbines	64
6.4.2	System Sizing for PRT, Waste Heat to Power, CHP and Fuel Cells	65
6.4.3	System Sizing for Projects Exporting Power to the Grid.....	65
6.4.4	System Sizing for RES-BCT Customers	65
6.4.5	System Sizing Limitations - Ineligible Host Customer Loads.....	65
6.5	Eligible Fuel Requirements	66
6.5.1	Renewable Fuel Blending Requirements.....	66
6.5.2	Directed Biogas Project Requirements	66
6.5.3	Directed Biogas Renewable Fuel Audits.....	66
6.5.4	Renewable Fuel Commitment Modifications.....	67
6.5.5	Pressure Reduction Turbine Requirements	67
6.6	Incentive Calculation for Generation Projects.....	67
6.6.1	Incentive Declines Based on Generation Capacity.....	68
6.7	Performance-Based Incentive Payment (PBI)	68
6.7.1	PBI Payments for Export to the Grid Projects	69
6.8	Renewable Fuel Annual Payment Requirements	69
6.8.1	Directed Renewable Fuel Verification	69
6.8.2	On-site Renewable Fuel Verification.....	70
6.9	Incentive Limitations for Projects using Renewable Fuel	71
6.9.1	Limitations on PBI based on GHG Emissions Reductions.....	71
6.9.2	Limitations on PBI Adjustments based on Renewable Fuel Verification	72
6.9.3	Incentive Limit for the Renewable Fuel Adder	72

6.9.4	Blended Fuel Generating Systems Converted to 100% Renewable Fuel	72
6.10	Application Documentation Requirements for Generation Projects.....	73
6.10.1	Required Documentation for Reservation Request	73
6.10.2	Required Documentation for Proof of Project Milestone.....	80
6.10.3	Required Documentation for Incentive Claim	83
6.11	Metering & Monitoring Requirements for Generation Projects	86
7	Metering & Data Collection	91
7.1	Data Reporting and Transfer Rules – Contract for PDP Services	91
7.1.1	Data Format	92
7.1.2	Meter Reading and Data Submission Timeline.....	92
7.1.3	Online Submission Process	93
7.1.4	PDP Data Validation	93
7.1.5	Data Audits & Payment Validation	93
7.1.6	PDP Performance Exemptions	94
7.1.7	PDP Non-Performance	94
7.1.8	Data Retention	95
7.1.9	Technical and Customer Support.....	95
7.1.10	Program Administrator Liability	95
7.2	PDP Application Process	96
7.2.1	Data Transfer Test	96
7.3	Data Privacy and Security.....	96
7.4	Measurement & Evaluation (M&E) Activities	97
7.4.1	M&E Field Visits	97
7.4.2	M&E Metering Requirements	97
7.4.3	Disposition of SGIP Metering Equipment.....	98
8	Dispute Resolution.....	99
9	Participant Performance and Infractions.....	100
9.1	Participant Performance.....	100
9.1.1	Application.....	100

9.1.2	Inspection	100
9.1.3	Attrition and Extensions	100
9.1.4	Data Reporting	101
9.1.5	SGIP Online Application Database Operation	101
9.1.6	Developer	101
9.2	Infractions.....	101
9.2.1	Issuance of Warnings and Infractions	101
	Definitions and Glossary	102
	Legislation and Regulatory Background	108
	Appendix A - System Calculation Example.....	116
	Efficiency Calculations.....	116
	Appendix B – Combustion Emission Credit Calculation	117
	Appendix C - Conversion of Emissions PPM to Lb/MWH.....	119
	Appendix D – Conversion Tables for HVAC-Integrated S-TES	121
	Appendix E – Updates to the GHG Emissions Factor Section 379.6(b)(2) as Amended by Senate Bill 861	
	124	
	SGIP GHG Emissions Eligibility Factor – The Equation	124
	Appendix F – Incentive rate for large-scale storage projects claiming the ITC at all incentive levels	126

Program Administrator Contact Information

Potential program participants can obtain information and apply for incentive funding through the following Program Administrators:¹

Pacific Gas & Electric (PG&E)

Website: www.pge.com/sqip
Email Address: selfgen@pge.com
Telephone: 1 (877) 743-4112
Mailing Address: Self-Generation Incentive Program
PO Box 7433
San Francisco, CA 94120
Overnight Mailing Address: 245 Market Street
Mail Code N9K
San Francisco, CA 94105-1797

Center for Sustainable Energy® (CSE)

Website: www.energycenter.org/sqip
Email Address: sgip@energycenter.org
Telephone: (858) 244-1177
Mailing Address: Center for Sustainable Energy
Attn: Self-Generation Incentive Program
3980 Sherman Street,
Suite 170
San Diego, CA 92110

Southern California Edison (SCE)

Website: www.sce.com/SGIP
Email Address: SGIPgroup@sce.com
Telephone: (626) 302-0610
Mailing Address: Self-Generation Incentive Program
Southern California Edison
P.O. Box 800
Rosemead, CA 91770-0800

Southern California Gas Company (SoCalGas)

Website: <https://www.socalgas.com/for-your-business/power-generation/self-generation-incentive>
Email Address: selfgeneration@socalgas.com
Mailing Address: Self-Generation Incentive Program
Southern California Gas Company
555 West Fifth Street, GT20B8
Los Angeles, CA 90013-1011

¹ Potential eligible projects located in the service territory of both Southern California Edison and the Southern California Gas Company can apply for incentive funding to either Program Administrator, but not to both.

Program Overview

The Self-Generation Incentive Program (SGIP) provides financial incentives for the installation of new qualifying technologies that are installed to meet all or a portion of the electric energy needs of a facility. The purpose of the SGIP is to contribute to Greenhouse Gas (GHG) emission reductions, demand reductions and reduced customer electricity purchases, resulting in the electric system reliability through improved transmission and distribution system utilization; as well as market transformation for distributed energy resource (DER) technologies.

This handbook establishes the policies and procedures of the SGIP for potential program participants and other interested parties. The SGIP has been approved by the California Public Utilities Commission (CPUC) and is subject to change in whole or in part at any time without prior notice. Any changes made to the SGIP will be published in revisions to this Handbook and/or posted at each Program Administrator's (PA's) website. The Program Administrators are Pacific Gas and Electric (PG&E), Southern California Edison (SCE), the Southern California Gas Company (SoCal Gas) and the Center for Sustainable Energy[®] (CSE).

2

² CSE is the Program Administrator for SDG&E customers.

1 Budget

1.1 Statewide Program Budget and Administrator Allocations

Authorized incentive collections through the end of 2019 total \$501,735,000.³ Additional funds made available through attrition will be added to Program Administrators' budgets as they become available.

Authorized incentive collections for each Program Administrator are as follows:

Pacific Gas and Electric Company	\$217,620,000
Southern California Edison Company	\$169,260,000
Center for Sustainable Energy	\$66,495,000
Southern California Gas Company	\$48,360,000

The SGIP shall be administered on a continuous basis. Program Administrators will issue incentive reservations until all incentive funds have been fully allocated.⁴

The current budget, incentive rates, and incentive steps in each Program Administrator territory are posted at www.selfgenca.com.

1.2 Budget Allocation

The budget is divided accordingly and described in detail below:

Energy Storage Technologies – 80% of funds

- Beginning in Step 3, 75% of energy storage funds will remain in the general budget, including the large-scale and small residential carve outs.
- Beginning in Step 3, 25% of energy storage funds are directed to the Equity Budget, including the non-residential and residential carve outs.

Generation Technologies – 20% of funds

Energy Storage General Budget

The incentive budget allocates 80% to energy storage technologies, with 13% of the energy storage category carved out for small residential projects less than or equal to 10 kW. The small residential storage carve-out is set per each Program Administrator step and operates independently of the large-scale carve out. Once the funds in the residential carve-out fifth step in an individual PA's territory are exhausted, PAs may use funds from the large-scale storage category, if available, to fund additional small residential projects as they are submitted. Furthermore, the PAs may file a Tier 2 advice letter to change the allocation

³ Available authorized incentives include 50% of 2016 collections (D.15-12-027) plus authorized incentive collections for 2017, 2018 and 2019 (D.14-12-033 and D.17-04-017).

⁴ Total available funding includes authorized incentive collections, funds from cancelled projects, and application fee forfeitures.

to residential projects less than or equal to 10kW before the opening of Steps 2, 3 or 4 if the PAs find a modification is justified by the ratio of demand to budget for such projects exhibited in an earlier step relative to the ratio of demand to budget for projects greater than 10kW in size.

Additionally, if a single PA territory allocates more than 13% of its total energy storage funds to small residential projects, the amount of funds that exceeds 13% will count toward the statewide minimum goal of 13%. Once the minimum 13% of energy storage funds are allocated to small residential projects statewide, PA territories that have not yet allocated all of their small residential funds may transfer the funds into the large-scale storage budget category. However, before transferring funds from the small residential storage carve-out to the large-scale budget category, PAs must first file an advice letter.

Energy Storage Equity Budget

For energy storage incentive steps 3-5, each PA's energy storage general budget (large-scale and small residential) is reduced by 25% in Steps 3-5 to create an energy storage Equity Budget for eligible projects. Additionally, within the Equity Budget, 10% is carved out for qualifying residential projects (single family and multi-family low-income housing) regardless of the size of the project. The residential equity carve-out is set per each Program Administrator step and operates independently of the Equity Budget for non-residential customers.

Generation Budget

The incentive budget allocates 20% to generation technologies, with a minimum of 40%⁵ of the generation category carved out for renewable generation projects.⁶ The minimum amount of incentives set aside for renewable generation technologies is set statewide, across all four Program Administrators.

⁵ The sum of the renewable generation budget per D.17-04-017 combined with 40% of authorized collections in the generation budget per D.16-06-055.

⁶ Defined as wind, waste heat to power, pressure reduction turbines, and 100% biogas as defined by the most recent RPS guidelines.

2 Applications

2.1 Application Process

Applications are subject to the incentive rates of the Program Administrator to which they apply. Generally, applications will be assigned an incentive rate and reviewed in the order in which they are received. However, in the event that application submissions on a single day exceed available funding in a given Program Administrator's territory for a given budget and step, a lottery will be initiated. Lottery details are found in *Section 2.3.2*. Please refer to www.selfgenca.com for the most up-to-date information on current incentive steps, rates, and available funds.

2.1.1 Application Submission

All SGIP applications and required documents⁷ at all stages of the application process must be submitted via the SGIP online application database at www.selfgenca.com. **Mailed, emailed, faxed or hand delivered applications will not be accepted.**

In order to submit an application and/or project documentation, companies or individuals must create an account and register users at www.selfgenca.com. Once the account has been confirmed, registered Applicants may create and edit applications.

Only complete applications may be assigned incentive funds or be placed into a lottery. Only complete applications may receive an approved reservation. Duplicate applications or multiple submissions for the same project will be rejected.⁸ Applicants must agree to the Terms of Use pertaining to the SGIP online application database in order to submit an application. The Terms of Use can be found at www.selfgenca.com.

Once an application is entered into the SGIP database and submitted for consideration within a given step, it will be retained in the database. In the event a lottery is implemented and the application is *not* selected for the current step, the Applicant must update relevant documentation and resubmit the application in order to be considered in the next incentive step.

2.1.2 Signatures

Original signed documents or scanned copies of original signed documents are required for all program provided forms.⁹ Electronic signatures and/or acknowledgments are acceptable for documents created by

⁷ With the exception of the application fee check that is to be mailed directly to the Program Administrator. See *Section 5.4.1* and *Section 6.10.1* for more information.

⁸ Duplicative applications are considered a program infraction. See *Section 9* for information on program infractions.

⁹ Includes: Reservation Request Forms, Proof of Project Milestone Forms, Incentive Claim Forms, and all affidavits. All forms requiring signatures from multiple parties must have all signatures submitted on one document.

the Contractor or Host Customer, such as the installation contract.¹⁰ The signature on any signed document submitted to the Program Administrator shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such signature page were an original thereof.

2.1.3 ***File Retention***

Although “wet” signatures are not required on submitted documents, original signed documentation must be retained by the Applicant, Host Customer and/or System Owner for at least five years from the date of submission. Program Administrators reserve the right to request original signed documents within the five year period.

2.2 **Incentive Process Flowcharts**

There are two application processes illustrated below:

- Three-Step Application Process - Figure 2.2-1
- Two-Step Application Process - Figure 2.2-2

All residential projects and non-residential projects less than 10 kW must follow the two-step application process. Non-residential projects greater than or equal to 10 kW must follow a three-step process.

Figure 2.2-1: Three-Step Application Process for Public and Non-Public Entities \geq 10 kW

¹⁰ E-signatures may be acceptable for other program documents depending on Program Administrator territory. Please contact your Program Administrator for more information.

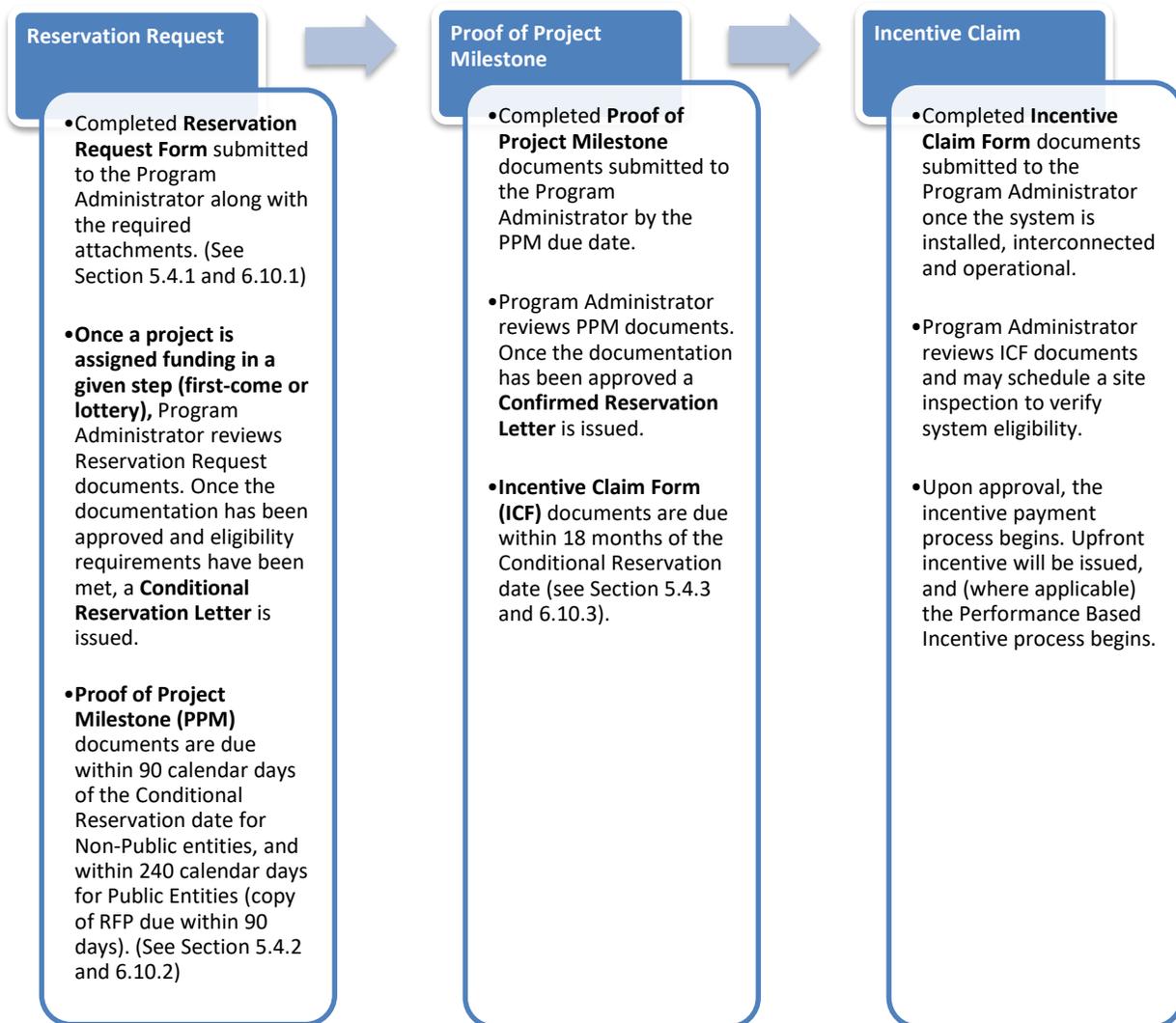
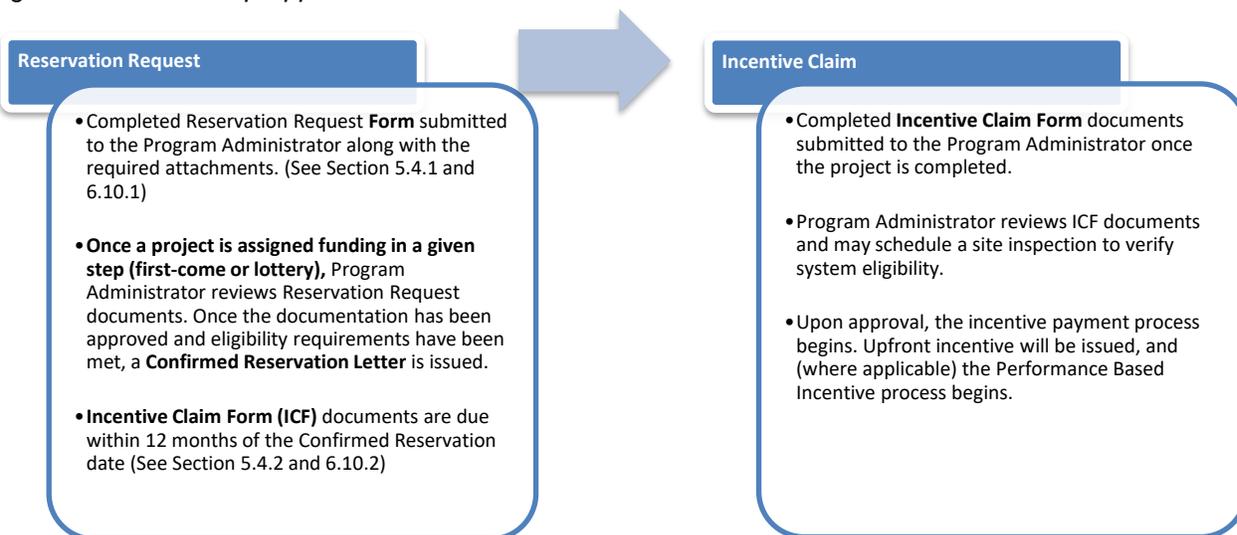


Figure 2.2-2: Two-Step Application Process for All Residential and Non-Residential Entities <10 kW



2.3 Reservation Request

To request an incentive, an online Reservation Request Form (RRF) must be submitted with required attachments. Non-residential projects are required to submit an application fee upon submittal of the RRF. (See *Section 5.4.1* and *6.10.1* for required attachments specific to storage and generation technologies.) Projects that include multiple technologies must submit separate applications for each technology.

2.3.1 *Submitting the Reservation Request*

After all Reservation Request documents have been uploaded to the SGIP online application database, Applicants must submit their complete application package to the appropriate Program Administrator. Applicants may not submit applications in excess of the Developer cap for the active step. Once an application is assigned an incentive rate, the Program Administrator will review the application package to ensure the project meets all program requirements. Incentive funds may only be reserved after the Program Administrator receives and approves the Reservation Request documents.

2.3.2 *Lottery Process*

A lottery will be triggered only in the event that applications submitted on a single day exceed funds available for a given budget and step. Lotteries are to be conducted separately for large scale energy storage technologies, small residential energy storage technologies less than or equal to 10 kW, and generation technologies by Program Administrator territory, as necessary. All applications not selected in the lottery will be rejected and must reapply in the next funding step in order to receive funding.

2.3.2.1 *Priority Projects*

The following energy storage projects shall have priority in the SGIP lottery process:

- Energy storage projects located within the service territory of Los Angeles Department of Water and Power.¹¹
- Energy storage projects located within the West Los Angeles Local Reliability Area of Southern California Edison's service territory.
- Energy storage systems paired with an on-site renewable generator and claiming the Investment Tax Credit (ITC) or, if not claiming the ITC, charging a minimum of 75% from the on-site renewable generator.

Energy storage projects that meet more than one criterion shall be given the highest priority. A lottery will be held for the projects in the priority or non-priority category that exceeds available funding in the active step.

Generation projects shall have priority in the SGIP lottery in the following order:

- 1) Renewable projects using wind, waste heat to power, pressure reduction turbines, or 100% on-site biogas will be given first priority.
- 2) 100% directed biogas will be given second priority.

¹¹ All projects interconnecting into LADWP's electrical grid must abide by LADWP interconnection rules.

- 3) Blended on-site biogas will be given third priority.
- 4) Blended directed biogas will be given fourth priority.

A lottery will be held for the priority category that exceeds available funding in the active step.

2.3.3 *Pause Period*

When a budget category changes to the next incentive step the Program Administrator will initiate a pause period of no less than 20 days, whereby:

- No new applications within the budget category are accepted.
- The Program Administrator may perform a pre-screen to reject applications with missing documentation or applications submitted above the Developer cap, and to verify projects identified with a locational priority.
- If required, the lottery is conducted.
- After 10 days, Program Administrators will determine if the incentive level reduction for energy storage technologies shall increase from \$0.05/Wh to \$0.10/Wh between incentive steps based on statewide oversubscription for a given step.
- If a lottery is conducted, a notification of the results of the lottery is sent to Applicants. Applications that were not selected for funding in the current step through the lottery will be instructed on how to reapply for funding in the next step.
- Projects that are only able to be partially funded within a certain step must choose to reapply for funding in the next step or claim the remaining funds in the current step.¹²
- The SGIP public website is updated with information on the new incentive rate(s), available funds and the date of the next application submission opportunity.

2.3.4 *Incomplete Reservation Request*

Reservation Request documents must be complete and submitted as part of the application package. If an application is found to be missing any required information or requires additional clarification, the Program Administrator or their representative will request the information necessary to process that application further. Applicants have 15 calendar days to respond with the necessary information. If after 15 calendar days the Applicant has not submitted the requested information, the application may be cancelled. Cancelled applications may be resubmitted and will be treated as a new application (i.e. all required documents must be resubmitted) and processed in sequence along with other new applications. Funds from cancelled projects will be allocated to the currently active incentive step in the Program Administrator's

¹² Projects are not allowed to be assigned a "split incentive" across two or more incentive steps.

SGIP incentive budget. If the Program Administrator is in a pause period when attrition occurs, the funds will be placed in the next incentive step.

2.3.5 Approval of Reservation Request

Upon Program Administrator approval of the Reservation Request package (Reservation Request Form and required attachments) the Applicant and Host Customer will receive a reservation letter. The two types of reservation notice letters are based on the type of application:

Conditional Reservation Letter (for Three-Step applications)

Upon approval of the Three-Step Reservation Request package, a Conditional Reservation Letter will be issued confirming that a specific incentive amount is conditionally reserved for project. The letter will list the approved incentive amount, the Proof of Project Milestone date and the reservation expiration date. All reservations are conditional pending receipt of the Proof of Project Milestone documentation on or before the Proof of Project Milestone date.

Confirmed Reservation Letter (for Two-Step applications)

Upon approval of the Two-Step Reservation Request package, a Confirmed Reservation Letter will be issued. The Confirmed Reservation Letter will list the approved incentive amount and the reservation expiration date (12 months after the date of the Confirmed Reservation Letter). Upon project completion and prior to the reservation expiration date, the completed Incentive Claim Form must be submitted along with all of the necessary documentation to request an incentive payment.

2.3.6 Wait List and Program Closure

Once funds have been fully allocated in the final incentive step of a Program Administrator's given budget, applications will be placed on a wait list to be funded as incentive funds become available throughout the remainder of the program. When there is enough attrition to fund wait-listed projects, wait listed projects will be assigned an incentive rate in the last step and reviewed in the order in which they were submitted. In the event that there are available funds and all wait-listed projects have been allocated funding, new applications will be subject to normal program procedures specified in *Section 2.1*. Program Administrators may continue accepting new applications until all incentive funds have been fully paid or until December 31, 2020¹³, whichever comes first.

2.4 Proof of Project Milestone

Two-Step Applications must submit all Proof of Project Milestone (PPM) documents as part of their Reservation Request. For Three-Step Applications, Non-Public Entities have 90 calendar days from the date of the Conditional Reservation Letter to satisfy all Proof of Project Milestone criteria. For Three-Step

¹³ SB 861 extended SGIP administration through 2020

Applications, Public Entities must submit a copy of the issued Request for Proposal (RFP) or equivalent for purchase or installation of the system within 90 calendar days of the date of the Conditional Reservation Letter; Proof of Project Milestone documentation must then be submitted within 240 days of the date of the Conditional Reservation Letter.

2.4.1 Submitting Proof of Project Milestone

Once the Online Proof of Project Milestone is completed and all the required attachments are uploaded, the PPM package must be submitted to the appropriate Program Administrator via the online application database.

2.4.2 Incomplete Proof of Project Milestone

If the Proof of Project Milestone package is not received by the Proof of Project Milestone date, the application may be cancelled by the Program Administrator.

If the Proof of Project Milestone documentation is incomplete and/or requires clarification, the Program Administrator will request the information necessary to process that application further. Applicants will have 15 calendar days to respond with the necessary information. If after 15 calendar days the requested information has not been submitted, the application may be cancelled. Any project attrition and forfeited application fees will be allocated to the current incentive step in the Program Administrator's SGIP incentive budget. If the Program Administrator is in a pause period when attrition occurs, the funds will be placed in the next incentive step.

2.4.3 Approval of Proof of Project Milestone

Once Proof of Project Milestone requirements have been successfully met, the Program Administrator will issue a Confirmed Reservation Letter. The Confirmed Reservation Letter will list the reservation dollar amount and the reservation expiration date (18 months after the date of the original Conditional Reservation Letter). Upon project completion and no later than the reservation expiration date, the completed Incentive Claim Form must be submitted along with all of the necessary documentation to request an incentive payment.

2.5 Incentive Claim

Once the project is complete, Applicants must request payment of the incentive amount by submitting the Incentive Claim Form (ICF) and all applicable Incentive Claim documents to the Program Administrator via the online application database. A project is considered complete when the system is completely installed, interconnected (if applicable), permitted, and capable of operating in the manner for which it was designed. Payment will be dispersed after the Program Administrator verifies by Post-Installation inspection¹⁴ (if the project is selected for a Post-Installation inspection) that the system meets all the eligibility requirements of

¹⁴ See Definition for *Inspections*.

the SGIP. The completed Incentive Claim Form must be submitted to the Program Administrator on or before the reservation expiration date together with the required attachments.

2.5.1 Submitting Incentive Claim

Once the Incentive Claim Form is complete and all the required attachments are submitted, Applicants may submit their Incentive Claim package to the Program Administrator via the online application database.

2.5.2 Incomplete Incentive Claim

If the complete Incentive Claim package is not received by the reservation expiration date, the application may be cancelled by the Program Administrator.

If submitted Incentive Claim documentation is incomplete and/or requires clarification, the Program Administrator will request the information necessary to process that application further. Applicants have 30 calendar days to respond with the necessary information. If after 30 calendar days the requested information has not been submitted, the application may be cancelled. Any project attrition and forfeited application fees will be allocated to the current incentive step in the Program Administrator's SGIP incentive budget. If the Program Administrator is in a pause period when attrition occurs, the funds will be placed in the next incentive step.

2.5.3 Inspections

Upon receipt of a complete Incentive Claim Form package, the Program Administrator may organize an On-site Post-Installation inspection (or virtual Post-Installation inspection for select residential applications)¹⁵ to verify that the project's system is installed as represented in the application, is operational, is interconnected and conforms to the eligibility criteria of the SGIP. Verification includes but is not limited to:

- If the project is 30 kW and larger, the metering system will be inspected and it will be verified that it follows the proposed monitoring plan and meets the metering requirements of the SGIP.
- If the project uses renewable fuel, the availability and flow rate of the renewable fuel will be demonstrated by the Host Customer and/or System Owner.
- If the project uses waste energy, the availability, temperature and production rate of the waste energy will be demonstrated by Host Customer and/or System Owner.
- Energy storage systems will be tested to validate the discharge energy capacity. Energy storage projects will be inspected according to the Energy Storage Field Verification Protocol. HVAC-integrated S-TES systems will be tested to show they can provide enough thermal energy to turn off the compressor of the accompanying HVAC unit for the specified discharge duration period. Refrigeration TES systems will be tested to show they can provide enough

¹⁵ Refer to Energy Storage Field Inspection and Discharge Testing Protocol and Field Inspection Sampling Protocol at www.selfgenca.com

thermal energy to turn off the compressor(s) and condenser(s) of the accompanying refrigeration system(s) for the specified discharge duration period.

- If the eligible system size depended on new construction or load growth, the required load will be confirmed.
- Verify system capacity rating to confirm the final incentive amount.

Energy storage inspections will follow the latest version of the Energy Storage Post-Installation Inspection and Discharge Testing Protocol found on www.selfgenca.com.

Failed Post-Installation Inspection

If the results of the Post-Installation inspection indicate that the project is not ready for approval, the Program Administrator will notify the Applicant, Host Customer and System Owner of the reasons for failure. The Applicant, Host Customer and System Owner will have up to 60 calendar days to bring the project into compliance. A subsequent inspection visit may be required to determine final approval. If the Applicant, Host Customer and System Owner fail to bring the project to full eligibility within the requested time, the application may be cancelled.

If the site load, renewable fuel or waste energy forecast has not yet materialized, the Applicant will be given two options:

1. Receive payment based on the site load, renewable fuel or waste energy availability (whichever is less) demonstrated at the time of initial Post-Installation inspection or;
2. Wait for the site load, renewable fuel or waste energy to materialize within 12-months from the date the Incentive Claim Form and documents were initially received. If the site load, renewable fuel or waste energy has not materialized within the 12-month period, the project will be paid based on the site load or system operating capacity available at the end of the 12-month period, whichever is less.

2.5.4 Approval of Incentive Claim

Upon final approval of the Incentive Claim documentation and completed virtual or On-Site Post-Installation Inspection (if the project is selected for a Post-Installation inspection), the Program Administrator will issue a final ICF approval letter. The incentive payment will be made approximately 30 days after the final approval letter is sent. Payment will be made to the assigned Payee as indicated on the Incentive Claim Form and will be mailed to the address provided.

2.6 Modifications and Extensions

All projects are expected to be installed as described on the Conditional and Confirmed Reservation Letter. In the event that changes are made during the development of the project and/or during the installation it is the responsibility of the Host Customer and/or Applicant to notify the Program Administrator as soon as

possible. Changes to the Host Customer or project site are generally not permitted and must be approved on a case-by-case basis by the Program Administrator. Unapproved changes may result in project cancellation.

2.6.1 Modifications Pre-ICF

Changes pertaining to System Owner, Payee, equipment type, or system capacity must be approved by the Program Administrator before the application can proceed. If the step to which a project is assigned has closed, modifications to the project will not result in additional incentive funding. At the Program Administrator's discretion, additional incentive funding for an application may be allowed only when a project is assigned to the currently active step and adequate funding is available.

Changes in equipment type, system capacity, Applicant, installer or other substantial changes may require new RRF and/or PPM documentation. Once the request has been approved, a new reservation letter may be issued. Changes do not extend the reservation expiration date.

2.6.2 Modifications Post-ICF

In general changes to the completed project are not allowed. In the event that a system needs to be upgraded or changed due to poor performance the Applicant must notify the Program Administrator of new equipment information and provide updated documentation to help support performance and measurement and evaluation activities. For projects adding generation see *Section 3.2.4*.

2.6.3 Extensions and Exceptions

Extension requests will be reviewed on a case-by-case basis and should be submitted in writing to the appropriate Program Administrator for review. Any extension granted to either the Proof of Project Milestone or Request for Proposal due date will not extend the reservation expiration date.

All projects will be limited to a maximum of three 6-month extensions of the reservation expiration date, after which the reservation expires automatically.¹⁶ Extensions will be for special circumstances only. Additionally, extensions will not be granted to projects that have not made satisfactory progress toward completion in compliance with established milestones and requirements. Any request for a second or third extension of the reservation expiration date requires unanimous SGIP Working Group approval, and the SGIP Working Group shall notify Applicants of the SGIP Working Group's decision in writing within 30 days. When considering a request for a second or third reservation expiration extension, the SGIP Working Group will consider:

- 1) Whether the project's delay is outside the control of the Host Customer;

¹⁶ D.15-06-002 granted a petition for modification to increase the number of six-month extensions from two to three.

2) Whether the project has made significant progress toward completion, and a timeline is provided showing the expected date of commissioning of the project and that interconnection of the project will fall within the third six-month extension of the project's reservation expiration date;

3) Whether the extension of the project's reservation expiration date will affect the Program Administrator's ability to incentivize other projects.

Eligible energy storage SGIP projects may rely on the longer of the extension granted under D.14-05-033 or the third six-month extension granted in D.15-06-002.

Any other procedure or documentation exceptions should be submitted to the appropriate Program Administrator and will be subject to Working Group approval.

3 Incentives

3.1 Incentive Rates

The incentive rates for the two budget categories of the SGIP, generation and energy storage, are provided below.

3.1.1 Generation Incentive Rates

Upon program opening, total generation incentive funds are divided across three steps. Generation incentives decline by \$.10/W between incentive steps, according to the following schedule:

Table 3.1.1 Generation Incentives per Watt (W)

	Step 1		Step 2		Step 3	
Technology Type	Initial Incentive Rate	Max Incentive w/ biogas adder	Initial Incentive Rate	Max Incentive w/ biogas adder	Initial Incentive Rate	Max Incentive w/ biogas adder
Generation Technologies	\$/W	\$/W	\$/W	\$/W	\$/W	\$/W
Wind	\$0.90	n/a	\$0.80	n/a	\$0.70	n/a
Waste Heat to Power	\$0.60	n/a	\$0.50	n/a	\$0.40	n/a
Pressure Reduction Turbine ¹⁷	\$0.60	\$1.20	\$0.50	\$1.10	\$0.40	\$1.00
Internal Combustion Engine CHP	\$0.60	\$1.20	\$0.50	\$1.10	\$0.40	\$1.00
Microturbine CHP	\$0.60	\$1.20	\$0.50	\$1.10	\$0.40	\$1.00
Gas Turbine CHP	\$0.60	\$1.20	\$0.50	\$1.10	\$0.40	\$1.00
Steam Turbine - CHP ¹⁸	\$0.60	\$1.20	\$0.50	\$1.10	\$0.40	\$1.00
Fuel Cell CHP	\$0.60	\$1.20	\$0.50	\$1.10	\$0.40	\$1.00
Fuel Cell Electric Only	\$0.60	\$1.20	\$0.50	\$1.10	\$0.40	\$1.00

¹⁷ Pressure reduction turbine includes but is not limited to, any small turbine generator installed in an existing, man-made channel for delivery of water, steam or natural gas. Decision 16-06-055 allows pressure reduction turbines to be eligible for the same renewable fuel adder which is available to other generators that directly or indirectly use fuel.

¹⁸ Steam Turbines were included in the program as a conventional topping cycle CHP technology in 2014 per Energy Division's Disposition Letter approving CSE Advice Letter (AL) 47-A, PG&E AL 3474-GA/4417-E-A, SCE AL 3038-E-A, and SoCalGas AL 4644-A.

3.1.2 Energy Storage Incentive Rates

Total energy storage incentive funds are divided across five steps. Energy storage incentives generally decline by \$0.05/Wh between incentive steps. However, if the previous incentive step becomes fully subscribed within 10 calendar days across all Program Administrator territories, the incentive decline to the next step for large-scale storage projects not claiming the ITC and the small residential carve-out- will be \$0.10/Wh rather than \$0.05/Wh. The incentive for large-scale storage projects claiming the ITC will maintain a 72% differential from the incentive rate for non-ITC large-scale storage projects in all steps.¹⁹

The table below has been updated to reflect the accelerated incentive decline beginning in Step 2. Please visit www.selfgenca.com for a list of current incentive rates.

Table 3.1.2 Energy Storage Incentives per Watt-hour (Wh)

	Step 1	Step 2	Step 3	Step 4	Step 5
Energy Storage General Budget	\$/Wh	\$/Wh	\$/Wh	\$/Wh	\$/Wh
Large Storage (>10 kW)	\$0.50	\$0.40	\$0.35	\$0.30	\$0.25
Large Storage Claiming ITC	\$0.36	\$0.29	\$0.25	\$0.22	\$0.18
Residential Storage (<=10 kW)	\$0.50	\$0.40	\$0.35	\$0.30	\$0.25
Energy Storage Equity Budget	\$/Wh	\$/Wh	\$/Wh	\$/Wh	\$/Wh
Non-residential Equity	N/A	N/A	\$0.35	\$0.30	\$0.25
Non-residential Equity Claiming ITC	N/A	N/A	\$0.25	\$0.22	\$0.18
Residential Equity ²⁰	N/A	N/A	\$0.35	\$0.30	\$0.25

¹⁹ A complete table of incentive rates for ITC and non-ITC-claiming large-scale projects is given in Appendix F

²⁰ Includes residential equity projects not claiming ITC, and residential equity projects claiming ITC and ≤10 kW.

Residential Equity Claiming ITC (>10 kW) ²¹	N/A	N/A	\$0.25	\$0.22	\$0.18
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The PA's Equity Budget and general budget will operate independently of one another. Within a given incentive step, if the Equity Budget is exhausted, any project eligible for the Equity Budget is eligible for the general SGIP budgets (i.e., non-Equity budgets) within that same incentive Step, provided there are remaining funds.

If a PA does not confirm any reservations in either the residential or non-residential Equity Budgets during any rolling three (3) month period, while five (5) or more energy storage projects not eligible for the SGIP Equity Budget secure confirmed reservations in the same time period, this will constitute a triggering event in the residential and/or non-residential Equity Budgets. If triggered, the PA will increase the incentive rate by \$0.05/Wh, but in no event shall the incentive exceed \$0.50/Wh.²²

3.1.3 ***Incentives for Technologies from a California Manufacturer***

An additional incentive of 20 percent will be added to the technology incentive for projects in which the equipment used is manufactured in California.²³ In order for a project to be eligible for the 20 percent adder, it must demonstrate that at least 50% of its capital equipment value is manufactured by an approved California Manufacturer.

3.1.3.1 **California Manufacturer Eligibility Criteria and Verification**

All California Manufacturers will be required to submit an application for California Manufacturer status and proof to support each criterion below.

California Manufacturers must meet the following requirements:

- Operate a manufacturing facility in California
- Licensed to conduct business in California
- Registered with a primary or secondary manufacturing NAICS code

²¹ To maintain consistency with administration of the general budget per D.16-06-055, the incentive rate for residential equity projects ≤10 kW is not adjusted by claiming the ITC.

²² Within 30 days of the triggering event the PA shall submit a tier 1 advice letter to inform Energy Division about the triggering event. The PA will use appropriate communication channels to inform customers about the increased incentive rate for their Equity Budget.

²³ The incentive for each project including the California Manufacturer adder shall be capped based upon the Incentive Limitations outlined in *Section 5.2 and Section 6.6, 6.7 and 6.9.*

3.1.3.2 Project Equipment Verification

Equipment is deemed to be manufactured in California if at least 50% of the value of the capital equipment has been made in a dedicated production line by an approved California Manufacturer. For the purposes of determining eligibility, the SGIP recognizes the following equipment types:

Generation	Energy Storage
Generator/Prime Mover	Storage medium (i.e. battery)
Ancillary equipment	Inverter
	Controller

3.1.3.3 How to Determine Value

Value is based on the capital cost of a single equipment type as listed above. The California Manufacturer supplying capital equipment component(s) with the largest cost percentage is the one whose California credentials will be considered. The largest cost percentage is the total value of the eligible capital equipment.

Example:

An energy storage project requests the California Manufacturer incentive adder. The project provides the following cost breakdown:

Equipment type	Company	Cost	Location Manufactured	Approved CA Manufacturer?
Advanced lithium ion batteries	ABC Company	\$12,000	111 Fake Street, Los Angeles, CA 90011	Yes
Bidirectional AC-DC inverter	Lizard Inverters	\$3,000	333 Jon Street, Phoenix, AZ 81234	No
Operating Controller	Nick Controllers	\$2,000	4444 Real Street, San Francisco, CA 92222	Yes

- Total system cost= \$17,000
- Battery cost percentage = 71%
- Inverter cost percentage = 18%
- Controller cost percentage = 11%

The capital equipment with the highest percentage cost is the battery. Since the battery was made by an SGIP approved California manufacturer, this project will be eligible to receive the 20% adder.

Beginning June 23, 2017, Program Administrators will deny requests for California Manufacturer status for manufacturers that have not met the above requirements, including suppliers which were previously approved. Also, beginning June 23, 2017, projects will receive the adder only when using equipment from an approved California Manufacturer under the above requirements. New projects that apply before June 23, 2017 with a previously approved “California Supplier” may retain the adder only if that manufacturer is re-approved under the above requirements by the Incentive Claim stage.

3.2 Incentive Limitations

Incentive amounts for both generation and storage projects can be limited by a number of factors, including maximum incentive amount, total eligible project costs, sizing limitations per site, and incentives from other sources. Please refer to *Section 5.2* and sections 6.6, 6.7 and 6.9 for incentive calculations and limitations specific to energy storage and generation technologies, respectively.

3.2.1 Maximum Incentive Amount

The maximum incentive amount per project shall not exceed \$5 million.

3.2.2 Total Eligible Project Costs

No project can receive total incentives (to include any combination of the technology incentive, biogas adder, and/or California Manufacturer) that exceed the Total Eligible Project Costs. Submittal of Project cost details is required to report Total Eligible Project Costs and to ensure incentive limits are not exceeded. Equipment and other costs outside of the project envelope are considered ineligible project costs but must also be reported.

The following costs may be included in Total Eligible Project Cost:

1. Engineering feasibility study costs.
2. Engineering and design costs.
3. Environmental and building permitting costs.
4. Equipment capital costs.
5. Primary heat recovery equipment, i.e. heat recovery equipment directly connected to the generation system whose sole purpose is to collect the waste heat produced by the power plant. For example, a heat exchanger or heat recovery boiler (a.k.a., heat recovery steam generator, or HRSG) used to capture heat from a gas turbine is an eligible cost.
6. Heat recovery piping and controls necessary to interconnect the generating equipment to either the Primary Heat Recovery Equipment or the heat recovery piping and controls within the space primarily occupied by the generator partitioned by a fence or wall, whichever cost is less. If there is no identifiable Primary Heat Recovery Equipment and no identifiable space primarily occupied by the generator, eligible heat recovery piping and control costs shall be limited to the generator skid.

7. Construction and installation costs. For projects in which the equipment is part of a larger project, only the construction and installation costs directly associated with the installation of the energy equipment are eligible.
8. Interconnection costs, including:
 - a. Electric grid interconnection application fees
 - b. Natural gas grid interconnection costs
 - c. Metering costs associated with interconnection
9. Warranty and/or maintenance contract costs associated with eligible project cost equipment. The cost of this component is capped at 10% of the total claimed project costs.
10. System metering, monitoring and data acquisition equipment as well as additional on-board monitoring equipment and costs associated with the PDP contract.
11. Air emission control equipment capital cost.
12. Gas line installation costs, limited to the following:
 - a. Costs associated with installing a natural gas line on the customer's site that connects the serving gas meter or customer's natural gas infrastructure to the distributed generation unit(s).
 - b. Customer's cost for an additional (second) gas service to serve the distributed generation unit if this represents a lower cost than tying to the existing meter or gas service.
 - c. Customer's cost for any evaluation, planning, design, and engineering costs related to enhancing/replacing the existing gas service specifically required serving the distributed generation unit.
13. For Renewable fuel projects (except wind turbines), the cost of equipment to remove moisture and other undesirable constituents from Renewable Fuels that would damage the generation equipment. Such equipment includes but is not limited to "gas skids", dryers/moisture removal and siloxane removal towers.
14. Electricity storage devices
15. Renewable fuel projects (except wind turbines) may claim the cost associated with securing a bond to certify use of renewable fuel, described in the SGIP Contract, as eligible costs.
16. Sales tax and use tax.
17. Cost of capital included in the system price by the vendor, contractor or subcontractor (the entity that sells the system) is eligible if paid by the System Owner.
18. For Steam Turbine CHP projects where new or existing boiler capacity is being increased to generate power with a steam turbine, only the incremental costs directly associated with the increased capacity is considered an eligible project cost. If the boiler or any ancillary equipment directly associated with the increased capacity received an incentive or rebate from another source, the incentive or rebate amount is an ineligible project cost and must be deducted from the eligible cost of the project.

3.2.3 ***Incentive Calculation for Site with Multiple Systems***

Program participants can apply for incentives for multiple types of systems installed at one site. The total SGIP incentive is the sum of the incentive for each type of technology. When calculating the total eligible incentive for generation technologies, the incentives are to be calculated sequentially until the 3 MW limit is reached, with the lowest incentive rate (\$/Watt) technology portion calculated first. For multiple generation technologies within a single incentive level, the incentives are calculated in the order in which they appear in Table 3.1.1, from top to bottom. When calculating the total eligible incentive for energy storage technologies, the incentives are to be calculated sequentially until the 6 MWh limit is reached.

3.2.4 ***Calculating Incentives with Existing Systems***

A system may be installed in addition to existing systems if all program eligibility requirements are met by the project. Backup generators are not considered “existing on-site generation”.

Sites with existing systems that have met their permanency requirements: The existing SGIP system capacity is not accounted when determining the current incentive. However, if the existing system is still in operation the existing capacity must be accounted in order to best determine new system size.

Sites with existing SGIP systems that have not met their permanency requirements: The existing SGIP system capacity is accounted first at the highest incentive rate and then the proposed system capacity incentive is added on top of the existing capacity to determine in which incentive capacity tier the proposed system falls. Energy storage system capacity is non additive with generation capacity for purposes of calculating the tiered incentive. The incentive calculation and capacity limits are treated separately for energy storage and generation technologies.

3.2.5 ***Calculating Incentives for Replacement Generation***

Installation of a new system intended to replace an existing system is allowed if all program eligibility requirements have been met and the replaced system has either never received incentives from the SGIP or the Energy Commission’s Emerging Renewables Program (ERP), or has received incentives from the SGIP, or ERP programs but has been in service for at least the applicable program’s permanency requirement. Systems that did receive incentives but have not met the appropriate program’s permanency requirements may only receive incentive on the incremental increase above the existing system’s rated capacity (kW for generation or kWh for energy storage).²⁴

The replaced system must also be fully decommissioned and removed from the site. The Program Administrator will confirm this has been completed as part of the Post-Installation Inspection.

²⁴ All applicable Incentive Limitations apply. See Section 5.2 and Section 6.6, 6.7, 6.9.

3.2.6 *Incentives from other sources*

Host Customers, Applicants, and System Owners are required to disclose information about all other incentives they have received, plan to receive or have applied for. For projects receiving incentives under other programs, the SGIP incentive may be reduced depending on the source of the other incentive.

- For other incentives funded 100% by Investor Owned Utility (IOU) ratepayers, the total SGIP incentive will be reduced by the full amount of the other incentive.
- For other incentives funded by Non-IOU Ratepayers, the total SGIP incentive will be reduced by 50% of the amount of the other incentive.

In order to protect against entities creating governance structures or affiliations that would allow them to achieve more funding than the capped amount, it is required that Host Customers, Applicants, and System Owners disclose information about all other incentives and eligible tax credits taken advantage of by them or any of their affiliates applicable to the project. **Failure to disclose such information will be considered an infraction and is subject to the penalties indicated in Section 9.**

3.2.7 *Developer Cap*

Any single Developer is limited to 20% of the SGIP incentive funding for a given budget category in each statewide incentive step. The Developer cap will be calculated separately for generation projects, large scale energy storage projects, small residential energy storage projects, and equity budget projects. Applicants may not submit applications for Developers in excess of the statewide Developer cap for the active step, and Program Administrators shall not issue conditional reservations to projects by a Developer that has already applied for reservations in a given step that exceed 20%. The Developer cap will be established by budget step and posted prior to program opening. The Developer cap will remain fixed for each budget step once the step is opened even if total available funds change.²⁵ Please see *Section 4.1.5* for the definition of a Developer.

3.3 **PBI Assignment**

If there is a change in ownership of the property which hosts the SGIP equipment, the new owner may continue to receive the Performance-Based Incentives (PBI) if the owner completes a new interconnection agreement. If the seller relocates the equipment, the owner may continue to receive the PBI incentive payments if the equipment is relocated within the same Program Administrator's service territory within six

²⁵ The developer cap will take into account all authorized collections approved in D.14-12-033 and D.17-04-017 as well as all other funds made available through project cancellation before the step opens.

months and the owner completes an interconnection agreement at the new address. In either case, the PBI payment sunset date will not be extended.

4 Program Eligibility

In order to qualify for incentives, all program eligibility criteria must be satisfied. The following section details these requirements.

4.1 Program Participant Criteria

4.1.1 *Host Customer*

Any retail electric or gas distribution class of customer (industrial, agricultural, commercial or residential) of PG&E, SCE, SoCalGas, or SDG&E is eligible to be the Host Customer and receive incentives from the SGIP.²⁶ The Host Customer must be the utility customer of record at the site where the SGIP system is or will be located. In the event that the Host Customer's name is not on the utility bill, a letter of explanation is required that addresses the relationship of the Host Customer to the named utility customer.

The Host Customer is the exclusive incentive reservation holder who is party to the SGIP Contract. The Host Customer has the authority to designate the Applicant, energy service provider, and/ or Developer and change any of these parties at any time with prior written notice to the Program Administrator.

4.1.1.1. Host Customer Eligibility for the Equity Budget

Non-residential projects:

For the Equity Budget, a non-residential project must meet one of the following customer criteria:

- Local governmental agency²⁷
- State governmental agency²⁸
- Educational institution²⁹
- Non-profit organization³⁰
- Small business³¹

Additionally, the project site must be located in a disadvantaged or low-income community. A disadvantaged community is defined as any census tract that ranks in the statewide top 25% most affected census tracts in the most recently released version of the environmental health screening tool, CalEnviroScreen, plus census tracts that score within the highest 5% of CalEnviroScreen's pollution burden, but do not receive an overall CalEnviroScreen score. A low-income community is defined as census tracts with median household incomes at or below 80% of the statewide median income, or with median

²⁶ "...retail electric or gas distribution class of customer..." means that the Host Customer pays for and receives distribution services, as defined by their respective utility rate schedule.

²⁷ Public Contracts Code § 22161(f)

²⁸ Government Code §11000

²⁹ Any institution that would otherwise be eligible for funding through the California Clean Energy Jobs Act (Proposition 39), or a college or university accredited to operate in California.

³⁰ An organization that is registered and in good standing with the California Secretary of State as a domestic non-profit entity.

³¹ A business or manufacturer, including affiliates, with average annual gross receipts of \$15 million or less, over the last three tax years.

household incomes at or below the threshold designated as low-income by the Department of Housing and Community Development's list of state income limits adopted pursuant to Section 50093.

Residential Projects:

For the Equity Budget, residential projects are classified as multi-family low-income housing or single-family low-income housing.

Eligible multi-family housing is defined as a multi-family residential building of at least five rental housing units that is operated to provide deed-restricted low-income residential housing³², and is either located in a disadvantaged community, or is a building where at least 80% of the households have incomes at or below 60% of the area median income³³. Any customer account in such buildings will be eligible for the Equity Budget.

Additionally, the Equity Budget is available to customers living in single-family low-income residences sold at an affordable housing cost to a lower income household that is subject to:

- a) a resale restriction³⁴, or;
- b) an equity sharing agreement, for which the homeowner does not receive a greater share of equity than described in paragraph (2) of subdivision (c) of Section 65915 of the Government Code, with a public entity or nonprofit housing provider organized under Section 501(c)(3) of the Internal Revenue Code that has as its stated purpose in its articles of incorporation on file with the office of the Secretary of State to provide affordable housing to lower income households³⁵.

4.1.2 **System Owner**

The System Owner is the owner of the SGIP incentivized equipment. In the case when a vendor sells a system to a Host Customer, the Host Customer is the System Owner. In the case of a leased system, the lessor is the System Owner. The System Owner shall be designated on the Reservation Request Form.

In the event that the System Owner is not the Host Customer and withdraws from the project, the Host Customer will retain sole rights to the incentive reservation and corresponding incentive reservation number. To preserve such incentive reservation and corresponding reservation number, the Host Customer must submit revised application documentation to the Program Administrator.

4.1.3 **Applicant**

An Applicant is the person or entity that is responsible for completing and submitting the SGIP application and serves as the main point of contact for the SGIP Program Administrator throughout the application process. Host Customers may act as the Applicant, or they may designate a third party to act as the

³² As described in clause (i) of subparagraph (A) of paragraph (3) of subdivision (a) of § 2852 of the Public Utilities Code.

³³ As defined in subdivision (f) of §50052.5 of the Health and Safety Code.

³⁴ Certain and specific "presumed resale restrictions" meet this requirement. See section 5.4.1 for more information.

³⁵ Subparagraph (c) of paragraph (3) of subdivision (a) of 2852 of the Public Utilities Code

Applicant on their behalf. Host Customers may elect to change the Applicant at any time with prior written notice to the Program Administrator.

4.1.4 **Payee**

A Payee is the person or entity to whom the SGIP incentive check is made payable. The Payee may be any person or entity designated by the Host Customer on the Incentive Claim Form.

4.1.5 **Developer**

For applications received in Steps 1 and 2:

A Developer is the corporate entity that holds the contract for purchase and installation of the system, and/or alternative System Ownership Agreement (such as a Power Purchase Agreement) with the host customer and handles the project's development activities. The Developer must fully disclose their participation in developing the project and/or ownership in the project, or that of a combination of affiliated installers/developers. The customer contract will be verified at Proof of Project Milestone to confirm the Developer's representations. When applicable, the Developer cap will apply to any combination of affiliated developers under the same majority ownership.

For applications received in Step 3 or later:

A Developer is, if not individual homeowners applying for SGIP incentives for systems located on their own property, the corporate entity registered and in good standing with the Secretary of State of California that handles a substantial amount of the project's development activities.

An exclusive list of a project's development activities to be used for the purpose of applying this definition to the Program's developer cap is as follows:

1. Approaching or communicating with the host customer about the project and learning about its needs and energy profile
2. Developing the specifications for a system based on the customer's needs and interests
3. Soliciting bids from multiple manufacturers for the specified system
4. Gaining the customer's commitment to purchase or lease the specified system, usually but not necessarily by signing a purchase order with a customer or other form of agreement
5. Purchasing the specified system from the manufacturer to fulfill the obligation to provide a system to the customer
6. Securing permits for the system on behalf of the customer
7. Securing interconnection permission for the system on behalf of the customer
8. Submitting SGIP applications on behalf of the customer
9. Liaising with the SGIP administrators on incentive reservations
10. Liaising with the SGIP administrators on data reporting requirements

11. Supplying project data to SGIP evaluators
12. Physically constructing the system at the customer's premises
13. Installing the system at the customer's premises

For the purpose of this definition, the Program Administrators, with oversight from Energy Division, have discretion to determine whether a participant handles such activities, and whether a participant handles a substantial amount of these activities for a given project. If a reassignment of Developer status for a given project occurs after an SGIP application is submitted but before a confirmed reservation is issued, and leads to a participant retroactively exceeding its developer cap for a given incentive Step, a sufficient number of reservation requests for that participant shall be cancelled to bring the participant under its developer cap.

4.1.5.1 Developer Application Process

All SGIP projects must select a pre-approved Developer before the application may be submitted. A list of approved Developers will be available at www.selfgenca.com. Entities interested in becoming an approved SGIP Developer must submit the Developer Eligibility Application to the Program Administrators, containing the following information:

- If a parent company for the participant exists, the ultimate owner of the parent company if the parent company is nested within other parent-child corporate relationships – revelation of the ultimate owner is required
- Any ownership interest – including a minority interest – in the developer held by another developer or ultimate owner of another developer
- The identity of the entity, if reasonably foreseeable, that will execute any of the following development activities if it is not the developer named in the Developer Eligibility Application:
 - Approaching or communicating with the host customer about the project and learning about its needs and energy profile
 - Developing the specifications for a system based on the customer's needs and interests
 - Soliciting bids from multiple manufacturers for the specified system
 - Gaining the customer's commitment to purchase the specified system, usually by signing a purchase order with a customer or other form of agreement; or owning the system during its lifetime and signing a lease or other similar agreement with the customer
 - Purchasing the specified system from the manufacturer to fulfill the obligation to provide a system to the customer
 - Securing permits for the system on behalf of the customer
 - Securing interconnection permission for the system on behalf of the customer
 - Filing SGIP applications
 - Liaising with the SGIP administrators on incentive reservations

- Liaising with the SGIP administrators on data reporting requirements
 - Supplying project data to SGIP evaluators
 - Physically constructing the system at the customer's premises
 - Installing the system at the customer's premises
- If the developer plans to divide project development activities with another entity in different ways for different projects, the developer must note that on the application form and submit supplemental information with the Developer Eligibility Application describing those other ways for other projects.
 - To the extent not described in the section asking for information on execution of project development activities, a description of relationships with other SGIP participants, including commercial or financial relationships between developers that do not share the same majority ownership, in developing and/or owning any existing projects funded in whole or in part by SGIP or reasonably foreseeable future projects that may be funded in whole or in part by SGIP.

Additionally, if requested by the Program Administrator, Developers must provide the following documentation:

1. Articles of incorporation,
2. Certificate of incorporation,
3. Operating agreements or similar applicable organizational document of Developer and most current financial statements.

Only one participant per project can be determined by the Program Administrators or Energy Division to handle a substantial portion of the project's development activities.

Acceptance by the Program Administrators of a Developer Eligibility Application does not guarantee that a participant qualifies as a Developer of any given project.

The Developer must fully disclose its participation in developing the project and/or ownership in the project, or that of a combination of affiliated installers/developers. The Developer must disclose relationships with other SGIP participants in developing and/or owning any existing projects funded in whole or in part by SGIP or reasonably foreseeable future projects that may be funded in whole or in part by SGIP to the Program Administrators on an ongoing basis and in the Developer Eligibility Application. For example, if a Developer purchases the contract for purchase and installation of a system from another Developer, each Developer must describe the transaction in its Developer Eligibility Application, or inform the Program Administrators of the transaction if the Developer Eligibility Application has already been accepted. Note

that the relationships between Developers to be disclosed to the Program Administrators include commercial or financial relationships between Developers that do not share the same majority ownership.

The customer contract will be verified at Proof of Project Milestone to confirm the Developer's representations. When applicable, the Developer cap will apply to any combination of affiliated developers under the same majority ownership. Majority ownership may be evidenced by the ownership interest in different Developers by: a single parent corporation, the distinct subsidiaries of a single parent corporation, a private equity firm, an investment bank, a group of individual shareholders, or any other entity that the Program Administrators or Energy Division in their discretion determine to constitute the same majority ownership of different Developers.

In order to ensure that majority ownership can be accurately assessed by the Program Administrators, all Developers will be required, upon request, to disclose the identity of all of their equity holders, including the ultimate ownership interests in those equity holders.

Failure to disclose relationships with other participants in a Developer Eligibility Application shall be considered an infraction.

4.2 Equipment Eligibility

The SGIP intends to provide incentives for reliable, permanent and safe systems that are professionally installed and that comply with all applicable Federal, State and local regulations. Host Customers and System Owners are strongly encouraged to become familiar with applicable equipment certifications, design, and installation standards for the systems they are contemplating. The following section describes the specific equipment eligibility criteria for systems that want to participate in the SGIP.

4.2.1 Commercial Availability

Commercially available, factory-new equipment is eligible for incentives. "Commercially available" means that the major system components are acquired through conventional procurement channels.

All eligible technologies must be certified for safety by a nationally recognized testing laboratory (NRTL). An application may be submitted for a device that has not yet received certification from an NRTL if the certification process is underway, however proof of certification must be submitted at the latest with the Incentive Claim documents. Failure to submit proof of certification with the Incentive Claim documents will result in cancellation of the project.

If NRTL certification is not applicable for the technology type, it must be supported by a 10-year warranty as consistent with Rule 21 interconnection standards. In the event that Rule 21 interconnection standards or NRTL certification do not require a separate manufacturer's warranty, a single 10-year service warranty

is sufficient. If Rule 21 interconnection standards or NRTL certification require a separate 10-year manufacturer's warranty in addition to the 10-year service warranty, then the obligation for dual warranties must be met by the project.

4.2.2 Interconnection

All systems receiving incentives under the SGIP that discharge electricity³⁶ must be connected to the local electric utility's distribution system and must be installed on the Host Customer's side of the electric utility meter. The interconnection, operation, and metering requirements for the systems shall be in accordance with the local electric utility rules for customer generating facility interconnections. Energy storage systems must also be configured to operate in parallel with the grid.

In order to connect a system to the electric utility distribution system, Host Customers and/or System Owners will be required to execute certain documents such as, but not limited to, an "Application to Interconnect a Generating Facility" and a "Generating Facility Interconnection Agreement" with the local electric utility. Written certification of interconnection and parallel operation to the Program Administrator prior to the Reservation Expiration date will be required. Applicants, Host Customers, and System Owners are solely responsible to submit interconnection applications to the appropriate electric utility interconnection department as soon as the information to do so is available to prevent any delays in system parallel operation. For more information on electric grid and/or natural gas pipeline interconnections, please contact your local utility.

Systems will be eligible to receive a reservation up to 12 months after receiving authorization to operate in parallel with the grid from the electric utility.

4.2.3 Permanent Installation

The intent of the SGIP is to provide incentives for equipment installed and functioning for the duration of its useful life. Only permanently installed systems are eligible for incentives. This means that the system must demonstrate to the satisfaction of the Program Administrator adequate assurances of both physical and contractual permanence prior to receiving an incentive.

Physical permanence is to be demonstrated by electrical, thermal and/or fuel connections in accordance with industry practice for permanently installed equipment and be secured to a permanent surface (e.g. foundation). Any indication of portability, including but not limited to temporary structures, quick disconnects, unsecured equipment, wheels, carrying handles, dolly, trailer or platform, will deem the system ineligible.

Contractual permanence, corresponding to a minimum of the length of the applicable warranty period (10 years), is to be demonstrated as follows:

³⁶ For example, TES does not discharge electricity and therefore does not require an interconnection agreement.

- System Owner agrees to notify the Program Administrator in writing a minimum of 60 days prior to any change in either the site location or change in ownership of the system if the change(s) takes place within the applicable warranty period.
- All agreements involving the system receiving an incentive are to be provided to the Program Administrator for review as soon as they become available. These agreements include, but are not limited to, system purchase and installation agreements, warranties, leases, energy or services agreements, energy savings guarantees and system performance guarantees.

4.2.4 ***Ineligible Equipment***

The following equipment is not eligible for participation in the SGIP:

- Backup systems intended solely for emergency purposes³⁷
- Any system/equipment that is capable of operating on, or switching to, diesel fuel or diesel cycle for start-up or continuous operation
- Field demonstrations for proof-of-concept operation of experimental or non-conventional systems partially or completely paid by research and development funds
- Rebuilt, refurbished or relocated equipment (e.g. second life batteries)
- Equipment that has been interconnected for more than 12 months

4.2.5 ***System Sizing for Projects without Peak Demand Information***

Sites with 12-months of previous energy usage data (kWh) but without peak demand (kW) information available (e.g., customers on rate schedules without a demand component) will have an equivalent peak demand calculated using the highest amount of energy consumed (kWh) in a given interval in the previous 12 months of consumption at the project site divided by the duration of that interval, in hours. The most granular interval for which there is 12 months of available data should be used.

For example, if a residential customer's meter collected hourly interval data for a 12-month period, and this data revealed that the greatest hourly consumption data was 5.5kWh during the previous 12 months, then the peak demand estimate would be 5.5 kW. If the data revealed that the greatest consumption within a 15-minute interval was 5.5kWh during the previous 12 months, then the peak demand estimate would be 22 kW.

³⁷ Operate as short-term temporary replacement for electrical power during periods of Electric Utility power outages. In addition to emergency operation they ordinarily only operate for testing and maintenance. Backup generators do not produce power to be sold or otherwise supplied to the grid or provide power to loads that are simultaneously serviced by the Electric Utility grid. Backup generators only service customer loads that are isolated from the grid either by design or by manual or automatic transfer switch. Adopted Affidavit Form in CPUC Resolution E-4717.

For customers with less than 12 months of history with the utility or customers that have meters incapable of recording interval usage data, methodology from Section 220 of the National Electric Code (NEC) may be used to determine instantaneous peak demand.

4.2.6 Eligibility for New Technologies

Systems consisting of new technologies not already included in the list of eligible SGIP technologies listed in *Section 3.1.1 and Section 3.1.2* may become eligible for the SGIP if its first commercial installation occurred less than ten years prior to SGIP funding. New technologies must meet all applicable eligibility and program requirements. Developers of such technologies seeking eligibility must follow the Program Modification Guidelines as outlined in *Section 4.2.7*.

4.2.7 Program Modification Guidelines

For the consideration of new technologies and/or SGIP rule changes, the following Program Modification Guidelines as outlined in Decision 03-08-013 should be followed:

All Program Modification Requests (PMRs) must be submitted in writing, using the current PMR format to the SGIP Working Group for review at least 10 business days prior to the SGIP Working Group meeting or the request will roll over to the next monthly SGIP Working Group meeting.

All parties requesting a program modification will be required to meet with the SGIP Working Group during a monthly SGIP Working Group meeting to determine if the Working Group would support the PMR.

The SGIP Working Group will first determine whether or not the proposed PMR requires a modification to a prior Commission Decision. If the PMR is minor and non-substantive and does not require modifications to prior Commission orders, then:

- The Working Group will review the PMR. If accepted, the Working Group will make the appropriate changes to the Handbook.
- If the Working Group needs more information, the party proposing the PMR would have the opportunity to present at the following Working Group meeting with additional information which supports its request for a program change.
- The Working Group will make a decision to accept or deny the PMR based on the new information presented in the follow-up presentation.
- The proposed program change and the Working Group recommendation(s) and rationale will be captured in the Working Group meeting minutes.
- If the party objects to the Working Group's decision to deny the PMR, the party may write a letter to Energy Division stating why their program change should be included in the SGIP.

Information that supports the party's reasons to accept the program change must be included in the letter.

- Energy Division will then make a final decision on whether to approve the PMR.
- Energy Division will report its final decision at the following SGIP Working Group meeting, which will be captured in the SGIP Working Group meeting minutes.
- If the PMR is accepted, appropriate revisions to the SGIP Handbook will be made.

If the proposed change requires modification to a prior Commission order or if the PMR addresses large programmatic or substantive issues, then:

- The Working Group will review the PMR and make a recommendation to support or oppose the PMR in the same meeting.
- The Working Group recommendation and rationale will be captured in the Working Group meeting minutes.
- Subsequent to the meeting, the Working Group will write up a summary of the discussion of the PMR at the Working Group meeting, a list of comments in support or against the PMR, as well as the Working Group's overall recommendation with rationale, which will be presented to the Applicant.
- The party proposing the PMR has the choice to move forward and submit a Petition to Modify (PTM) for Commission review regardless of the Working Group's recommendation, but the Working Group's summary must be included in the PTM.
- The Energy Division participates in Working Group meetings and is welcome to participate in the discussion related to the PMR as well as in generating the "list of issues." The Energy Division does not need to participate in the "recommendation" portion of the Working Group's PMR review.
- Once the PTM is filed with the Commission, the normal PTM process will transpire, only it will have the benefit of the idea being somewhat vetted before submittal. All parties have a chance to comment on PTMs according to the Commission's Rules of Practice and Procedure.
- The Commission will review and address the PTM in a decision.

5 Energy Storage Technologies

The following sections outline the eligibility requirements, rating criteria, incentive calculation guidelines and application documentation requirements and metering requirements specific to SGIP energy storage projects. Additionally, all projects are subject to the general program requirements as outlined in sections 2, 3 and 4.

5.1 Rating Criteria for Energy Storage Projects

5.1.1 *Rated Capacity (W)*

The rated capacity (W) for energy storage technologies is calculated as follows:

- DC/AC systems: The nominal voltage multiplied by the amp-hour capacity multiplied by the applicable efficiency divided by the duration of discharge ($(V_{DC} \times \text{Amp-Hours} \times (1 \text{ kW}/1000\text{W}) \times \text{Applicable Efficiency}) / \text{Duration of Discharge}$).
 - The following specifications must be provided to calculate rated capacity:
 - Duration of discharge (hours)
 - DC dischargeable amp-hour capacity, associated with the duration of discharge specified, including all losses and ancillary loads (such as power conditioning and thermal management)
 - Nominal voltage (V_{DC})
 - Applicable efficiency (if necessary), which accounts for conversion, transformation, or other efficiency losses (e.g. Inverter CEC weighted efficiency, DC-DC converter efficiency, etc.)
 - The continuous maximum power output capability of the system.³⁸ For DC systems, this is rated in DC, and for AC systems, this is rated in AC.
- HVAC-integrated S-TES: Calculated using the Conversion Tables for HVAC-integrated S-TES found in Appendix D, based on the SEER rating and tonnage of the HVAC unit with which the S-TES system will be integrated and the climate zone in which the project is located.
- Refrigeration TES: Calculated using the Refrigeration TES kW Worksheet, and is based on the following parameters of the refrigeration system(s) with which the Refrigeration TES system will be integrated: Energy Efficiency Ratio (EER) of the compressor group, nameplate BTU/h capacity of the compressor group, and maximum recorded output of the compressor group (as a percentage of nameplate compressor group horsepower), the number of condenser fans, nameplate condenser fan power, and maximum recorded output of the condenser fan group (as a percentage of nameplate condenser fan group output).

³⁸ Maximum continuous output might be determined by the maximum continuous discharge power/current of the system or by the continuous rated output of the inverter.

5.1.2 Energy Capacity (Wh)

The energy capacity (Wh) for energy storage technologies is calculated as follows:

- DC/AC systems: The nominal voltage multiplied by the amp-hour capacity multiplied by the applicable efficiency ($V_{DC} \times \text{Amp-Hours} \times (1 \text{ kW}/1000\text{W}) \times \text{Applicable Efficiency}$).
 - The following specifications must be provided to calculate energy capacity:
 - Duration of discharge (hours)
 - DC dischargeable amp-hour capacity, associated with the duration of discharge specified, including all losses and ancillary loads (such as power conditioning and thermal management)
 - Nominal voltage (V_{DC})
 - Applicable efficiency (if necessary), which accounts for conversion, transformation, or other efficiency losses (e.g. Inverter CEC weighted efficiency, DC-DC converter efficiency, etc.)
- HVAC-integrated S-TES: The rated capacity (W) multiplied by the avoided compressor(s) run-hours that the system can provide in a single discharge.
- Refrigeration TES: The rated capacity (W) multiplied by the avoided compressor(s) and condenser(s) run-hours that the system can provide in a single discharge.

5.2 Incentive Calculation for Energy Storage Projects

Incentives for a proposed energy storage system are calculated by multiplying the energy capacity (Wh) of the system by the incentive rate for the appropriate step.

$$\text{Incentive} = \text{Energy capacity (Wh)} * \text{incentive rate}$$

5.2.1 Incentive Declines Based on Storage Duration

Energy storage incentives are reduced as the duration of energy storage (Wh) increases in relation to the rated capacity (W) according to the following schedule:

Table 5.2.1 Energy Storage Incentive Duration Decrease

Storage Duration	Incentive Rate (Pct. Of Base)
0-2 hours	100%
Greater than 2 hours to 4 hours	50%
Greater than 4 hours to 6 hours	25%
Greater than 6 hours	0%

Example 1: 2-Hour System

200 kWh storage system at \$.40/Wh =

$200,000 \text{ Wh} * \$.40/\text{Wh} = \mathbf{\$80,000}$

Example 2: 4-Hour System

400 kWh storage system at \$.40/Wh =

$200,000 \text{ Wh} * \$.40/\text{Wh} = \$80,000$

$200,000 \text{ Wh} * \$.20/\text{Wh} = \$40,000$

$\$80,000 + \$40,000 = \mathbf{\$120,000}$

5.2.2 Incentive Declines and Caps Based on Energy Capacity (Wh)

Energy storage incentives are paid up to 6 MWh of capacity with tiered incentive rates. For energy storage projects that are greater than 2 MWh, incentives decline according to the following schedule:

Table 5.2.2: Tiered Incentive Rates

Energy Capacity	Incentive Rate (Pct. of Base)
0 – 2 MWh	100%
Greater than 2 MWh to 4 MWh	50%
Greater than 4 MWh to 6 MWh	25%

5.2.3 Performance-Based Incentive Payment (PBI)

For projects 30 kW and larger, 50% of the incentive will be paid upon project completion and verification. The remaining 50% will be paid on a performance-based incentive (PBI). Annual kilowatt hour-based payments will be structured so that under the expected annual operational requirements³⁹ a project would receive the entire stream of performance payments in five years.

To calculate the basis (\$/kWh) of the annual PBI payments the following calculation is made:

$\mathbf{\$/kWh} = \text{remaining 50\% of incentive} / \text{total anticipated kWh discharge/offset}$

³⁹ See Section 5.3.3

Total anticipated kWh discharge/offset = energy capacity (kWh) * 130 full discharges⁴⁰ * five years

For a 5-year period the PBI payment will be paid annually based on recorded kWh of electricity discharged or offset over the previous 12 months.

$$\text{PBI Payment} = \$/\text{kWh} * \text{actual annual kWh discharged/offset}$$

Example PBI Payment for a two-hour system:

100 kWh system at \$.50/Wh

Total incentive: 100,000 Wh * \$.50/Wh = \$50,000

Upfront payment: \$50,000 / 2 = \$25,000

Remaining payment to be recuperated through PBI: \$50,000 / 2 = \$25,000

Total anticipated kWh discharged/offset: 100 kWh * 130 full discharges * 5 years = 65,000 kWh

\$/kWh for anticipated kWh discharged/offset: \$25,000 / 65,000 kWh = \$0.3846154/kWh

PBI payment per year assuming 130 full discharges: 13,000 kWh * \$0.3846154/kWh = \$5,000

5.3 Eligibility Requirements for Energy Storage Projects

Energy storage projects may be stand-alone or paired with generating systems and must be capable of discharging fully at least once per day. Energy storage systems paired with wind generation must have the ability to handle hundreds of partial discharge cycles each day. Residential energy storage projects, whether stand-alone or paired, must comply with additional requirements specified in the Residential Energy Storage Eligibility Affidavit designed to ensure that all residential energy storage systems participating in the SGIP will be used for more than just back-up emergency purposes.

5.3.1 Greenhouse Gas Emission Standards

Energy storage systems must maintain a round trip efficiency equal to or greater than 69.6% in the first year of operation in order to achieve a ten-year average round trip efficiency of 66.5%, assuming a 1% annual degradation rate. The ten year average round trip efficiency will be verified through performance warranties, contractual requirements, or other supporting documentation. The charge and discharge of the energy storage system will account for all ancillary loads.

⁴⁰ For commercial projects only. If this was a residential project sized 30 kW or greater, 52 full discharges would be required.

5.3.2 **System Size Parameters**

System size requirements are applicable for systems that are rated above 10 kW. Systems that are rated at 10 kW or less are exempt from the sizing requirements.

Energy storage projects, whether paired or stand-alone, may be sized up to the Host Customer's previous 12-month annual peak demand (kW). For new construction or projects with future load growth, projects can be sized up to future peak demand, but the load must be substantiated before the incentive can be paid. HVAC-integrated S-TES systems must be sized no larger than the tonnage of their accompanying HVAC unit and cannot be integrated with HVAC units greater than 20 tons. Refrigeration TES systems must be sized no larger than the tonnage of their accompanying refrigeration system(s).

5.3.3 **Operational Requirements**

Commercial systems are required to discharge a minimum of 130 full discharges per year. Residential systems are required to discharge a minimum of 52 full discharges per year. A "full discharge" is the equivalent of discharging the SGIP-incentivized energy capacity, whether it is during a single or multiple discharges.⁴¹

5.3.4 **Paired with On-site Renewables**

To be considered paired with and charging from on-site renewables, energy storage systems must either be claiming the Investment Tax Credit (ITC) or, if not claiming the ITC, charge a minimum of 75% from the on-site renewable generator.

5.3.5 **Demand Response Dual Participation**

Energy storage projects funded through the SGIP are eligible to provide demand response services or participate in demand response programs.

5.4 **Application Documentation Requirements for Energy Storage Projects**

5.4.1 **Required Documentation for Reservation Request**

Energy storage applications must provide a copy of the following:

Table 5.4.1: Reservation Request Requirements

Required Materials
1. Completed Reservation Request Form (<i>All Projects</i>)
2. Application Fee (<i>Non-Residential Projects only</i>)
3. Equipment Specifications (<i>All Projects not currently on the SGIP Energy Storage Equipment List</i>)

⁴¹ Each discharge does not have to be a 100% depth of discharge, but the aggregate amount of discharges over the year must equate to 130 full discharges.

Required Materials	
4. Proof of Utility Service/ Load Documentation	<i>(All Projects)</i>
5. Preliminary Monitoring Plan	<i>(All Applications >=30 kW and/or projects paired with on-site renewable generators)</i>
6. Proof of Equity Budget Eligibility	<i>(Equity Projects Only)</i>
	<ul style="list-style-type: none"> • Certification of Tax-Exempt Status <i>(Gov't and non-profit only)</i> • Proof of Eligibility under Proposition 39 or an Accredited Institution <i>(Educational Institutions Only)</i> • Small Business Affidavit <i>(Small business projects only)</i> • SGIP Multi-Family Low-Income Housing Documentation Cover Sheet <i>(Multi-family only)</i> • Copy of Deed-Restriction or Regulatory Agreement <i>(Multi-family only)</i> • Proof of Income Qualification <i>(Single-family only)</i> • Proof of PU Code Section 2852 Compliance <i>(Single-family only)</i>

Two-Step Applications should also include all applicable Proof of Project Milestone Documents (as outlined in Section 5.4.2) as part of their Reservation Request

1. **Online Reservation Request Form** *(All Projects)*

All applicants are required to complete the online Reservation Request Form (RRF). This online form is used to provide project details, contact information, and signed declarations. Residential energy storage projects must also fill out the Residential Energy Storage Eligibility Affidavit portion of the RRF.

As part of the RRF, the project Host Customer must attest that an Energy Efficiency Audit (EEA)⁴² has been performed for the project site and they received and reviewed the findings of the audit.

The RRF must be printed and signed by the Applicant, Host Customer and System Owner (if not Host Customer). A copy of the signed document must be uploaded to the online application database and the information contained on the signed copy of the RRF must match the information provided on the online RRF.

2. **Application Fee** *(Non-Residential Projects only)*

The application fee is equal to 5% of the requested incentive amount, payable by check, cashier check or money order, and should reference the project by site address.⁴³ The application fee is the only required document that must be mailed directly to the Program Administrator.⁴⁴ After a

⁴² An Energy Efficiency Audit (EEA) report issued within the past five years. A Title 24 energy efficiency compliance report issued within the past three years may also be used in lieu of an Energy Efficiency Audit.

⁴³ Application fees are specific to an application, not a site. If the same site reapplies to the program, they will need to submit a new application fee.

⁴⁴ A single application fee check for each project is required.

project is assigned to an incentive step, the application fee check must be mailed within 7 calendar days. If the check is not mailed within 7 calendar days, the project may be cancelled. Application fee checks returned by the financial institution without payment may result in cancellation of the application.

The application fee will be refunded upon completion and verification of the installed SGIP project. Prior to project completion, application fees are non-refundable once Confirmed Reservation has been issued.⁴⁵ All forfeited application fees will be allocated to the Program Administrator's current incentive step.

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

Equipment and/or component pairings that have been evaluated by the Technical Working Group can be found on the SGIP Energy Storage Equipment List at www.selfgenca.com. For projects using equipment and/or component pairings not yet evaluated by the Technical Working Group, manufacturer equipment specifications for all major components of the system, such as the storage component, as well as the inverter, DC-DC converter, controller and/or additional system components when applicable, are required. Rated capacity (kW), energy capacity (kWh), and round trip efficiency⁴⁶ for the storage system must be provided.

DC/AC systems must provide all specifications necessary to calculate the rated capacity and energy capacity, such as:

- Duration of discharge (hours)
- DC dischargeable amp-hour capacity, associated with the duration of discharge specified, including all losses and ancillary loads (such as power conditioning and thermal management),
- Nominal voltage (V_{DC}),
- Inverter CEC-AC efficiency
- DC-DC converter efficiency
- Inverter continuous power output rating (kW)
- The continuous maximum power output capability of the system.⁴⁷ For DC systems, this is rated in DC, and for AC systems, this is rated in AC.

HVAC-integrated S-TES must provide the TES system equipment specifications, HVAC system equipment specifications identifying the SEER and tonnage of the HVAC unit and the climate zone in which the project is located.

⁴⁵ Application Fees will not be altered due to project changes that may result in a different incentive.

⁴⁶ AC-AC for AC systems and DC-DC for DC systems

⁴⁷ Maximum continuous output may be determined by the calculated maximum continuous discharge power of the energy storage system or by the continuous rated power output of the inverter depending on which is less.

Refrigeration TES systems must provide TES system equipment specifications, refrigeration system equipment specifications, the Refrigeration TES kW Worksheet and backup documentation of any site-specific conditions, if relevant.

4. **Proof of Utility Service & Load Documentation** *(All Projects)*

Participation in the SGIP is restricted to customers who are located in PG&E, SCE, SoCal Gas or SDG&E service territories and physically connected to the Electric Utility transmission and distribution system. All applications must include a copy of a recent electric utility bill indicating the account number, meter number, Site address, and Host Customer name. Customers applying in PG&E and SoCalGas territory must also submit a copy of a recent gas utility bill. For new construction, the Host Customer must submit confirmation from the serving utility that their Site is within the Program Administrator's service territory. For projects applying in CSE and SoCalGas territory, applications for technologies that discharge electricity to the onsite load must include a copy of the previous 12-months of electric consumption including maximum demand and kWh consumption to confirm that the participating generation system meets the program sizing requirements. Electric utility customers of SCE and PG&E are not required to submit their 12 month electric consumption and demand data. SDG&E customers are also required to submit an Authorization to Receive Customer Information form, signed by the utility customer of record that authorizes CSE to access utility account information for systems greater than 10 kW or any other instance under CSE discretion if needed.

If the energy storage system is being sized based on new or future load growth (i.e. new construction or load growth due to facility expansion or other load growth circumstances) applications must include an engineering estimate with appropriate substantiation of the Site's annual peak demand forecast. Suggested methods of demonstrating load growth include Application for Service with corresponding equipment schedules and single line diagram; building simulation program reports such as eQUEST, EnergyPlus, EnergyPro, DOE-2, and VisualDOE; or detailed engineering calculations.

5. **Preliminary Monitoring Plan** *(All Applications ≥ 30 kW and/or projects paired with on-site renewable generators)*

The preliminary monitoring plan should demonstrate the following components:

Description of the proposed SGIP system:

Description of the system with an overview of the energy services to be provided by the system to the host site; the major components making up the system; and the intended operation of the system (e.g., demand charge management of the facility or specific end-use equipment, TOU

energy arbitrage, shifting excess renewable generation, etc.); Include photos and/or diagrams of the system if available.

A description of the existing load at the Site and identification of the sources of the fuel that would be displaced by operation of the SGIP system (i.e., electricity provided by XYZ utility or natural gas provided by ABC utility) and photos of the interface locations where the SGIP system would be located to displace the load.

Description of the metering system and metering approach:

An overview of the performance data to be collected and a simplified layout of the system showing major components and location of the proposed metering points and data to be collected at those points is required.

Description of the approach to be used for collecting, storing and transferring the necessary performance data:

- For example, if electrical energy performance data is to be collected, the reasoning behind the selected metering points
- Frequency with which the data is to be collected (e.g., 15 min intervals)
- Data storage capability and approach for transfer of data (e.g., cell modem) and frequency of reporting to PDP (e.g., daily, weekly) [this could also include frequency for reporting of data to Program Administrators, such as monthly]

Identification of the metering system components by performance data type (including manufacturer and model number)

- Electrical metering equipment (AC meters must be listed on the CEC's list of Eligible System Performance and Revenue Grade Meters to be found on <http://www.gosolarcalifornia.ca.gov/equipment/index.html>)
- Thermal energy metering equipment
- Data acquisition (i.e., logger) system

Systems Pairing with On-site Renewable Generators:

Energy storage systems paired with on-site renewable generators must provide a description of:

- The anticipated charge and discharge schedule of the system demonstrating that the system complies with ITC operational requirements or, for projects not claiming the ITC, will be charged at least 75% from renewables;
- The metering that will be used to verify that the system is being charged from renewables;
- The ability to provide data to verify operation in the event of an audit.

6. **Proof of Equity Budget Eligibility** *(Equity Projects Only)*

Certification of Tax-Exempt Status *(Gov't and Non-profit Projects Only)*

State and local government and non-profit entities are required to submit verification of their tax-exempt status.

Proof of Eligibility under Proposition 39 or an Accredited Institution *(Educational Institutions Only)*

For educational institutions, applicants must submit documentation proving eligibility under the California Energy Commission's Proposition 39 Program⁴⁸, or which confirm they are an accredited educational institution.

Small Business Affidavit *(Small Business Projects Only)*

Application documentation must include a signed affidavit affirming that the host customer is a business or manufacturer, including affiliates, with average annual gross receipts of \$15 million or less over the last three tax years.

Deed Restriction or Regulatory Agreement *(Multi-family Projects Only)*

For a multi-family residential complex financed with low-income housing tax credits, tax-exempt mortgage revenue bonds, general obligation bonds, or local, state or federal loans or grants, a deed restriction on the property, or a regulatory agreement signed and executed between the property owner/developer and entity issuing financing must be submitted.

SGIP Multi-Family Low-Income Housing Documentation Cover Sheet *(Multi-family Projects Only)*

To clearly outline how a project achieves Public Utilities Code Section 2852 low-income eligibility, applicants are required to submit a cover sheet identifying key details within the deed restriction or regulatory agreement such as, but not limited to, property owner name, public entity/non-profit agency name, expiration date of low income documentation, rent restriction description, and percent of households with incomes at or below 60% of the area median income. This will allow Program Administrators to more accurately and efficiently determine eligibility.

Proof of Income Qualification *(Single-family Projects Only)*

Documentation showing the host customer's household income is 80% of the area median income or less based upon a copy of the most recently available federal income tax return. Area Median Income is subject to annual changes based upon Housing and Urban Development's income guidelines.

⁴⁸Proposition 39 eligibility guidelines can be found at <http://www.energy.ca.gov/efficiency/proposition39/>

Proof of PU Code Section 2852 Compliance (Single-family Projects Only)

To demonstrate compliance with PU Code section 2852⁴⁹, applicants may submit a copy of a resale restriction or equity sharing agreement for which the homeowner does not receive a greater share of equity than described in paragraph (2) of subdivision (c) of Section 65915 of the Government Code. The resale restriction or equity sharing agreement must be between the homeowner and a public entity or a qualifying non-profit affordable housing provider. Additionally, a presumed resale restriction may also be demonstrated to meet the resale restriction eligibility requirement, such as single-family homes located in IRS-defined Qualified Census Tracts⁵⁰ and other designated areas eligible for the Single-Family Affordable Solar Homes (SASH) program.⁵¹

Additional Requirements for Two Step Applications

All 2 step applications must include as part of their Reservation Request materials, all applicable requirements of the Proof of Project Milestone. See Section 5.4.2.

5.4.2 Required Documentation for Proof of Project Milestone

Energy storage applications must provide a copy of the following:

Table 5.4.2: Proof of Project Milestone Requirements

Required Materials
1. Completed Proof of Project Milestone Form (All 3-Step Projects)
2. Copy of RFP or equivalent after 90 days (Public Entity Projects Only)
3. Copy of Executed Contract or Agreement for Installation (All Projects) <ul style="list-style-type: none">• Includes Required Warranty Documentation

1. **Online Proof of Project Milestone Form (All 3-Step Projects)**⁵²

The Online Proof of Project Milestone Form must be completed and signed by the Applicant and representatives with signature authority for both the System Owner and Host Customer (if not Host Customer). The online form must identify updated project information including the installation contractor’s name, telephone number and contractor license number. All systems must be installed by

⁴⁹ As described in subparagraph (c) of paragraph (3) of subdivision (a)

⁵⁰ Qualified Census tracts are defined by Internal Revenue Code Section 143(j)(2) as “a tract in which 70 percent or more of the families have income which is 80 percent or less of the statewide median family income” https://www.huduser.gov/portal/sadda/sadda_qct.html

⁵¹ Decision 15-01-027 allows presumed resale restrictions within the SASH program, such as those found in federally-designated Empowerment Zones, Enterprise Communities, certain Neighborhood Revitalization Areas, Targeted Employment Areas, and Qualified Census Tracts.

⁵² Not required for 2-Step Applications as part of the Reservation Request Package.

an appropriately licensed California contractor in accordance with rules and regulations adopted by the State of California Contractors' State Licensing Board (CSLB). Installation contractors must have an active A, B, or C-10 license, or a C-46 license for the combined installation of solar photovoltaics and energy storage.

2. **Request for Proposals (RFP) Documentation** *(Public Entities Only)*

Notice to Invite Bids, or similar solicitation issued for the installation, lease and/or purchase for systems proposed for the SGIP. The RFP must include sufficient project details such as the scope of work, schedule, terms, budget, and/or system components desired. For Public Entities not issuing an RFP, alternative documentation such as an executed letter of intent to engage with a contractor on the Host Customer letterhead, an executed contract/agreement for system installation/lease, an equipment purchase order, or alternate system ownership agreement must instead be submitted within 90 calendar days of the date the Conditional Reservation Letter. Proof of Project Milestone documentation must then be submitted within 240 days of the date the Conditional Reservation Letter.

3. **Executed Contract and/or Agreement for System Installation** *(All Projects)*

A copy of the executed contract for purchase and installation of the system, and/or alternative System Ownership Agreement (such as a Power Purchase Agreement) is required. The contract/agreement must be legally binding and clearly spell out the terms and scope of work. Purchase and/or installation agreements must also include system equipment and eligible system costs. All contracts/agreements must be signed by appropriate representatives (Host Customer, Installer, and/or System Owner) who are a party to the agreements of the SGIP reservation.

- As part of the Executed Contract, all storage systems are required to include a minimum 10 year service warranty. A service warranty ensures proper maintenance and continued project performance. The service warranty must cover the system maintenance to include (but not limited to) system support, problem diagnosis, on-site repair and preventative maintenance. The warranty should also include language to guarantee the continued performance of the system over the warranty period. The System Owner must provide proof of warranty and maintenance contract, and specify the warranty and maintenance contract start and end dates.

5.4.3 ***Required Documentation for Incentive Claim***

Energy storage applications must provide a copy of the following:

Table 5.4.3: Incentive Claim Requirements

Required Materials	
1.	Completed Incentive Claim Form <i>(All Projects)</i>
2.	Proof of Authorization to Interconnect <i>(Projects that interconnect with the electrical grid)</i>
3.	Building Permit Inspection Report <i>(All Projects)</i>
4.	Substantiation for New or Expanded Load (if applicable): <i>(All Projects)</i>
5.	Final Monitoring Schematic <i>(All Projects)</i>

1. **Online Incentive Claim Form** *(All Projects)*

The ICF information must be complete, accurate and represent the actual system, project costs and/or fuel information as installed (including system size and type). It must also be signed by the Applicant, Host Customer and System Owner (if not the Host Customer).

2. **Proof of Authorization to Interconnect** *(Projects that interconnect with the electrical grid)*

Host Customers and/or System Owners will be required to execute certain documents such as, but not limited to, an “Application to Interconnect a Generating Facility” and a “Generating Facility Interconnection Agreement” with the local Electric Utility. A copy of the signed letter from their Electric Utility granting the Host Customer and/or System Owner permission to interconnect and operate in parallel with the local grid should be submitted as proof of Authorization to Interconnect.

Applicants, Host Customers and System Owners are solely responsible to submit interconnection applications to the appropriate Electric Utility interconnection department as soon as the information to do so is available to prevent any delays in system parallel operation.

3. **Building Permit Inspection Report** *(All Projects)*

A copy of the final building inspection report (or proof of exemption) demonstrating that the Project meets all codes and standards of the permitting jurisdiction. Contact your local permitting jurisdiction to learn about permitting requirements.

4. **Substantiations for New Construction or Expanding Load** *(All Projects)*

For Projects where Host Customer estimated the future load to justify system size, applications must include documentation demonstrating that the load forecast has materialized.

5. **Final Monitoring Schematic** *(All Projects)*

The final monitoring schematic is an electrical single line diagram (SLD) that includes the energy storage system, the inverter, the utility meter, the load panel and, when applicable, the PBI meter and on-site renewable generator with which the energy storage system is paired. Documentation must also

be provided if there is a change in the make and model of the meters to be used (from what was submitted with the Preliminary Monitoring Plan at the Reservation Request).

For PBI projects, the Applicant must also provide the name of the Performance Data Provider (PDP) they are contracting with. A copy of the contract between the PDP and the Applicant may be requested at the Program Administrator's discretion.

5.5 Metering & Monitoring Requirements for Energy Storage Projects

For PBI purposes, all SGIP technologies 30 kW or larger must install metering and monitoring equipment that measures net electrical output or offset from the system(s). Conversely, storage projects less than 30 kW that are paired with and charging from on-site renewable generators must have the ability to provide data in the event of an audit, and may utilize metering and monitoring equipment that is already part of the system. Energy storage systems that discharge electricity must measure the net electrical energy during charge and discharge cycles. TES must measure electrical energy when charging. HVAC-integrated S- TES systems must monitor and report the power (kW offset) and energy (kWh offset) that would have been consumed by the HVAC unit to provide the same amount of cooling provided by the S-TES system by monitoring outside air temperature and when the S-TES system turned off the compressor of the HVAC unit. Refrigeration TES systems must report the power (kW offset) and energy (kWh offset) that would have been consumed by the refrigeration system(s) to provide the same amount of cooling provided by the Refrigeration TES system by monitoring the operating set points of the refrigeration system(s), cooling load on the refrigeration system(s), and when the Refrigeration TES system turns off the compressor(s) and condenser(s) of the refrigeration system(s).

System owners must install and maintain metering and monitoring equipment at their own cost and are responsible for the choice and installation of the metering hardware. All AC electric meters must be listed on the CEC's list of Eligible System Performance and Revenue Grade Meters to be found on <http://www.gosolarcalifornia.ca.gov/equipment/index.html>.

It is also the responsibility of the System Owners to contract with a Performance Data Provider (PDP) for a minimum of five years. PDPs will be tasked with recording performance data from the installed metering and monitoring equipment and submit it to the Program Administrators on a monthly basis.

All installed electrical meters must fulfill the following requirements:

- Protocols for the minimum required performance/output data must enable any PDP to communicate with the meter and obtain the minimum required performance/output data from the meter and/or logger.
- All meters must have the capability to report their data remotely.
- Data reporting must occur on a daily basis.

- All meters must have the ability to retain collected data in the event of a power outage. Meters must have the capability to store 7 days' worth of data.
- All meters must provide the PDP provider or defined list of authorized users with the ability to access and retrieve the minimum required data from the meter using the Meter Communication / Data Transfer Protocols described in *Section 7.1*.
- The meters will be inspected as part of the project inspection process.

The following section details the minimum meter requirements per type of meter installed.

5.5.1 **Minimum Electrical Meter Requirements**

All systems 30 kW and larger and/or storage projects paired with and charging from on-site renewable generators must be installed with a meter or metering system which allows the System Owner and Program Administrator to determine the amount of net system energy charge and discharge and allows the System Owner to support proper system operation and maintenance.

Electrical meters installed on the SGIP project provide data used to assess performance of the system, to analyze impact of the SGIP system on utility distribution systems, the peak system demand of the utility and net GHG emission impacts.

- **Meter Type**

All systems are allowed to use on-board electrical meters, however, the meter must meet the minimum meter requirements of this section. For all systems receiving PBI payments, the installed meter(s) may be a separate Interval Data Recording (IDR) meter(s), or a complete onboard system that is functionally equivalent to an IDR meter, recording data no less frequently than every 15 minutes. Program Administrators may have additional meter functionality requirements for systems receiving PBI payments, as the Program Administrators will use these meters to process PBI payments, and system compatibility may be required. For example, meters and service panels must meet all local building codes and utility codes. The meter serial number must be visible after installation.

- **Acceptable Electrical Metering Points**

For AC energy storage systems, a meter(s) must be installed on the AC side(s) of the energy storage device and account for power delivery to all parasitic loads including thermal management and power conditioning. For DC electrical energy storage systems, a meter(s) must be installed at a point within the electrical system to measure the charge and discharge of the energy storage device and account for power delivery to all parasitic loads, including thermal management and power conditioning (such as DC to DC conversion). For TES systems, one or more meters must be installed to directly meter or measure the data points necessary to calculate the rate and quantity of charge (in kW/kWh) and the rate and quantity of discharge (in kW/kWh offset).

- **Meter Accuracy**

All systems receiving a PBI incentive must install a meter accurate to within $\pm 2\%$ of actual system output. This applies to on-board electrical meters as well as external IDR meters.

- **Meter Measurement and Time Granularity of Acquired Data**

Electric meters must measure the net energy charged and discharged (kWh) and net real power charged and discharged (kW)⁵³. The PDP must log all required energy storage performance / output data points no less frequently than once every 15 minutes. The PDP must measure 15 minute energy and real power for the energy storage system during charging and discharging and account for all ancillary loads. The meter needs to generate an accurate time/date stamp.

- **Meter Testing and Certification**

$\pm 2\%$ AC electrical meters required for PBI must be tested according to all applicable ANSI C-12 testing protocols pertaining to the monitoring of power (kW) and energy (kWh). The accuracy rating of $\pm 2\%$ meters must be certified by an independent testing body (i.e., a NRTL such as UL or TUV). DC electrical meters must also have a $\pm 2\%$ accuracy pertaining to the monitoring of power (kW) and energy (kWh), as specified by the meter manufacturer.

- **Meter Display**

All meters must provide a display capable of showing the measured net charge and discharge energy output and measured instantaneous power during charging and discharging. This display must be easy to view and understand and must be physically located either on the meter or on a remote device. For PBI, if a remote device is the only visible access, the PA may ask for verification.

⁵³ For AC systems, measured in AC. For DC systems, measured in DC

6 Generation Technologies

The following sections outline operational eligibility, system size, fuel blending, incentive calculation, application documentation requirements and metering requirements specific to SGIP generation projects. Additionally, all projects are subject to the general program requirements as outlined in sections 2, 3 and 4.

6.1 Operational Eligibility Requirements for Projects Operating on Blended Fuel

The following section describes the operational eligibility requirements for participating generation technologies using any amount of fossil fuel.

6.1.1 *Minimum Operating Efficiency Requirements*

All generation technologies using blended fuel must meet or exceed a minimum operating efficiency requirement without the inclusion of renewable fuel. The systems can satisfy this requirement by either meeting:

1. Waste heat utilization requirements **OR**
2. Minimum electric efficiency

To facilitate minimum operating efficiency requirements and determine system eligibility, a Minimum Operating Efficiency Worksheet is available for download from the Program Administrators' websites.

Waste Heat Utilization

To meet minimum waste heat utilization, CHP systems must meet the requirements of Public Utilities Code 216.6, which are expressed in the following equations:⁵⁴

$$\text{P.U. Code 216.6 (a)} \Rightarrow T / (T + E) \geq 5\%$$

And,

$$\text{P.U. Code 216.6 (b)} \Rightarrow (E + 0.5 \times T) / F_{LHV} \geq 42.5\%$$

Where:

T \equiv the **annual** useful thermal output used for industrial or commercial process (net of any heat contained in condensate return and/or makeup water), heating applications (e.g., space heating, domestic hot water heating), used in a space cooling application (i.e., thermal energy used by an absorption chiller).

⁵⁴ PUC 216.6 - "Cogeneration" means the sequential use of energy for the production of electrical and useful thermal energy. The sequence can be thermal use followed by power production or the reverse, subject to the following standards: (a) At least 5 percent of the facility's total annual energy output shall be in the form of useful thermal energy; (b) Where useful thermal energy follows power production, the useful annual power output plus one-half the useful annual thermal energy output equals not less than 42.5 percent of any natural gas and oil energy input.

E ≡ the **annual** electric energy made available for use, produced by the generator, exclusive of any such energy used in the power production process.

F_{LHV} ≡ the generating system's **annual** Lower Heating Value (LHV) non-renewable fuel consumption.

Minimum Electric Efficiency⁵⁵

To meet the minimum electric efficiency criteria, the proposed generator's electrical efficiency must be equal or greater than 40%, which is expressed in the following equation:

$$\text{Electrical Efficiency} = E / F_{\text{HHV}} \geq 40\%$$

Where:

E ≡ the generating system's rated electric capacity as defined in *Section 6.1.5*, converted into equivalent Btu/hr using the factor 3,414 Btu/kWh.

F_{HHV} ≡ the generating system's Higher Heating Value (HHV) fuel consumption rate (Btu/hr) at rated capacity.

6.1.2 **NOx Emission & Minimum System Efficiency Standards**

Systems using blended fuel must not exceed a NOx emissions standard of 0.07 lbs/MW-hr and/or must meet the 60% minimum system efficiency requirement.⁵⁶

The minimum system efficiency shall be measured as useful energy output divided by fuel input in higher heating value. The calculated minimum system efficiency shall be based on 100 percent load. The following formula is to be used to determine the system efficiency:

$$\text{CHP System Efficiency} = (E + T) / F_{\text{HHV}} \geq 60\%$$

$$\text{Electric only System Efficiency} = E / F_{\text{HHV}} \geq 40\%$$

Where:

E ≡ the generating system's rated electric capacity as defined in *Section 6.1.5*, converted into equivalent Btu/hr using the factor 3,414 Btu/kWh

T ≡ the generating system's useful waste heat recovery rate (Btu/hr) at rated capacity.

F_{HHV} ≡ the generating system's Higher Heating Value (HHV) fuel consumption rate (Btu/hr) at rated capacity.

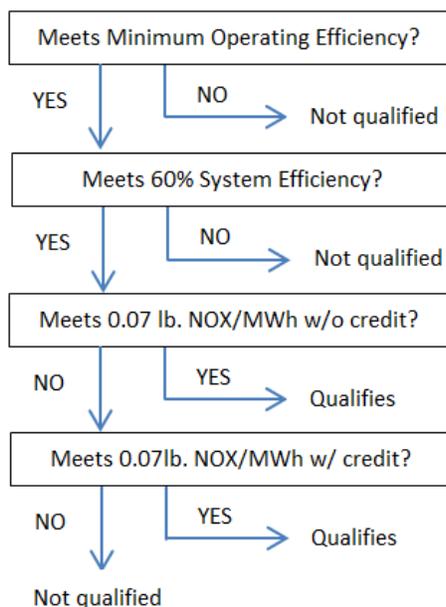
⁵⁵ This requirement was included as an alternative requirement to meeting Public Utilities Code 216.6 in compliance with AB 2778.

⁵⁶ An emission credit for waste heat utilization may be used to adjust the final emissions determination of eligibility.

CHP systems using blended fuels that fail to meet the NO_x emission standard but meet the 60% minimum system efficiency standard may be eligible to receive an emission credit for waste heat utilization.

CHP systems operating solely on waste gas are exempt from the NO_x emission requirements if the local air quality management district or air pollution control district, in issuing a Permit to Operate for the project, provides in writing a determination that the operation of the project will produce an on-site net air emissions benefit compared to permitted on-site emissions if the project does not operate. Waste gas systems, though exempt from NO_x emission requirements, still must meet the minimum operating efficiency requirement.

Figure 6.2.2: CHP System Efficiency and NOx Emissions Eligibility



6.1.3 Greenhouse Gas Emission Standards

The GHG eligibility factor is established based on the year in which the application is accepted. GHG eligibility for electric only systems is based on the First-Year Average factor. GHG eligibility for CHP systems is based on the ten year average factor. The ten-year average and first-year factors for years 2016 through 2020 are listed below.

Table 6.1.3: SGIP GHG Eligibility Emissions Factors, kgCO₂/MWh

Application Year	2016	2017	2018	2019	2020
10-Year Average	350	347	344	340	337
First-Year Average	334	332	329	325	321

- Greenhouse Gas Emission Standards for CHP Systems**

CHP systems operating on blended fuel must emit GHG emissions at a rate equal or lower than the applicable ten-year average factor. The gross GHG output is calculated by multiplying the annual fuel consumption of the generator in MMBtus by an emission factor of 53.02 kg CO₂/MMBtu⁵⁷ for the conversion of natural gas to CO₂. The GHG savings from waste heat recovery are calculated by dividing the annual waste heat recovered in MMBtus by 80% which represents nominal boiler efficiency and then multiplying by the 53.02 kg CO₂/MMBtu emission factor. The net GHG output of the generator is

⁵⁷ Unspecified natural gas conversion emission factor of Section 95112 of the mandatory GHG reporting regulation. Title 17 of the California Code of Regulations.

calculated by subtracting the GHG savings due to waste heat recovery from the gross GHG output. The GHG emissions rate for the generator is found by dividing the net annual GHG emissions by the annual electrical output of the generator in MWh and averaged over the years in operation.

- **Greenhouse Gas Emissions Standards for Electric-Only Systems**

Electric-only systems operating on blended fuel must demonstrate they will emit GHG emissions at a rate lower than the applicable annual average over ten years of operations, accounting for performance degradation, in order to receive SGIP incentives. For example, 2017 ten-year average (347 kg CO₂/MWh) is equivalent to a first-year emissions rate of 332 kg CO₂/MWh.

The ASME PTC 50-2002 will be used to determine the system's first year electrical efficiency and first year emission rate. The ten year average can be verified through performance warranties, contractual requirements, or other supporting documentation. Alternatively, the ten-year cumulative average net power of the fuel cell coupled with the fuel input rate (HHV) can be used to calculate the annual power generation (MWh) and fuel consumption (MMBtu) based upon an assumed capacity factor of 80%. The GHG output is calculated by multiplying the annual fuel consumption of the fuel cell in MMBtus by the emission factor of 53.02 kg CO₂/MMBtu for the conversion of natural gas to CO₂. The GHG emissions rate for the generator is found by dividing the annual GHG emissions by the annual electrical output of the generator in MWh.

6.1.4 **Reliability Criteria**

CHP systems operating on blended fuel must meet both of the following reliability requirements:

1. The self-generating facility must be designed to operate in power factor mode such that the generator operates between 0.95 power factor lagging and 0.90 power factor leading. This design feature will be verified by reviewing the manufacturer's specifications at the time of application and as part of the field verification visit before incentive payment approval.
2. System owners with facilities sized greater than 200 kW must coordinate the self-generation facility planned maintenance schedule with the electric utility. This allows the utility to more accurately schedule load and plan distribution system maintenance. The system owner will only schedule a facility's planned maintenance between October and March and, if necessary, during off-peak hours and/or weekends during the months of April to September.

6.1.5 **Rating Criteria for System Output**

The generating system rated capacity is the net continuous power output of the packaged prime mover/generator under the conditions defined below for each technology. In order to determine the net continuous power output, all ancillary loads must be subtracted from the gross output of the generator. Ancillary loads are defined as equipment loads, added as part of the SGIP generator project, necessary for the operation of the generator (e.g. fuel compressors, intercooler chillers, pumps associated with waste heat recovery, blowers used to transport renewable fuel, fuel clean-up equipment). System

capacity ratings are established at the time of Conditional Reservation Notification in order to determine the SGIP reservation dollar amount. If system modifications (i.e. changes in equipment make/model) are made after the Conditional Reservation Letter is sent, the system capacity must be re-rated using currently available published component information for the changed equipment. If the number of components has increased or decreased and there is no change in the make/model of the equipment used, system components can be re-rated using the same published information used at the time of the Conditional Reservation.

- Steam turbine CHP rated capacity is the net continuous power output of the packaged prime mover/generator at the average pressure and temperature of the steam produced by a boiler operating on blended fuel.
- For on-site biogas projects, the generating system capacity is the operating capacity based on the average annual available renewable fuel flow rate, including allowable non-renewable fuel at ISO conditions.⁵⁸
- For directed biogas projects, the generating system rated capacity is the net continuous power output of the packaged prime mover/generator at ISO conditions operating on a non-renewable fuel.
- Pressure reduction turbine technologies rated capacity is based upon the average pressure drop across and flow through the turbine, when flow exists, as determined by historical flow and pressure data from the previous year, if available, or from an engineering estimate if new construction or expanded load. Eligible technology system rated capacity must be substantiated with documentation from the manufacturer.

6.2 Capacity Factors

Generation systems are expected to operate at the following capacity factors:

Table 6.2: Assumed Capacity Factors

Technology Type	Capacity Factor
Wind turbine	25%
All other generation	80%

⁵⁸ Industry standard conditions to measure output – temperature at 59 degrees Fahrenheit and altitude at sea level (0 feet).

6.3 Operational Eligibility Requirements for Renewable Technologies and Generation Projects Operating on 100% Renewable Fuel

Generation systems operating on 100% renewable fuel are not subject to the operational requirements above. However, they are subject to all rating and sizing criteria below.

6.3.1 Rating Criteria for System Output of Renewable Technologies

The generating system rated capacity is the net continuous power output of the packaged prime mover/generator under the conditions defined below for each technology. In order to determine the net continuous power output, all ancillary loads must be subtracted from the gross output of the generator. Ancillary loads are defined as equipment loads, added as part of the SGIP generator project, necessary for the operation of the generator (e.g. fuel compressors, intercooler chillers, pumps associated with waste heat recovery, blowers used to transport renewable fuel, fuel clean-up equipment)

- Wind turbine technologies, less than 30 kW in capacity, a minimum hub height of 80 feet is required. No height limitation is imposed for turbines equal to or larger than 30 kW. For wind turbines of all sizes the wind turbine's rated capacity is based upon the highest electrical output from the manufacturer's power output curve for wind speeds up to 30 mph including inverter losses.
- Waste heat to power technologies rated capacity is based on the average waste heat production rate and temperature, when waste heat is available, as determined by historical waste heat and temperature data from the previous year, if available, or from an engineering estimate if new construction or expanded load.
- Pressure reduction turbine technologies rated capacity is based upon the average pressure drop across and flow through the turbine, when flow exists, as determined by historical flow and pressure data from the previous year, if available, or from an engineering estimate if new construction or expanded load. Eligible technology system rated capacity must be substantiated with documentation from the manufacturer.

6.4 Sizing Requirements for all Generation Systems

The following system sizing requirements are applicable for systems that are rated above 5 kW.

6.4.1 System Sizing for Wind Turbines

Host customers with a previous 12 month annual peak demand that is less than 333 kW may size wind turbine projects up to 200% of the annual peak demand at the proposed site. If the Host customer's annual peak demand is greater than or equal to 333 kW, wind turbine projects may be sized up to 300% of the peak demand at the proposed site. Sites hosting existing generation, must also meet these sizing limits including both the capacity of the proposed wind turbine and the capacity of any existing generators (excluding any backup generators).

6.4.2 System Sizing for PRT, Waste Heat to Power, CHP and Fuel Cells

Pressure reduction turbine, waste heat to power, steam turbine, gas turbine, microturbine, internal combustion engine and fuel cell projects may be sized up to the host customer's previous 12-month annual peak demand at the proposed site.

If the site hosts existing generation, the combined capacity of the proposed and existing generators (excluding any backup generators) must be no more than the host customer's maximum site electric load.

In order to reduce GHG emissions and optimize system efficiency, CHP systems using blended fuel must not exceed the on-site thermal load with the recovered waste heat on an annual basis.

6.4.3 System Sizing for Projects Exporting Power to the Grid

Systems that will be exporting power to the grid will size their generators based upon 125% of the last twelve months of electrical consumption (kWhs) at the site. The incentivized capacity of the generator will be based upon 100% of the last twelve months of electrical consumption at the site. The incentivized capacity will be determined by dividing the annual electrical consumption at the site (in kWh) by 8760 hours and the expected capacity factor of the technology as stated in *Table 6.3*.

6.4.4 System Sizing for RES-BCT Customers

Any local governments participating in the RES-BCT tariff (AB 2466) or any customer participating in FC-NEM (fuel cell customers who have been determined by the CPUC to achieve reductions in emissions of greenhouse gases pursuant to subdivision (b) of PU Code § 2827.10, and meets the emissions requirements for eligibility for funding set forth in subdivision (c) of PU Code Section 379.6, and has commenced operation on or before January 1, 2015) may size their systems to the total annual electrical load at the site where the generating system is located and the benefiting site(s) combined. However, they are only eligible for incentives up to the total annual electrical load (kWh) at the site where the generating system is located. Local government sites participating in the RES-BCT tariff must comply with the 5 MW cap per site.

6.4.5 System Sizing Limitations - Ineligible Host Customer Loads

The following loads cannot be considered when sizing a system:

- Customers who have entered into contracts for distributed generation services (e.g. distributed generation installed as a distribution upgrade or replacement deferral) and who are receiving payment for those services. This does not include Power Purchase Agreements, which are allowed.
- Any portion of a Host Customer's load that is committed to electric utility interruptible, curtailable rate schedules, programs or any other state agency-sponsored interruptible, curtailable or demand-response programs. For electric utility customers who are on an interruptible rate, only the portion of their electric load designated as firm service is eligible for the SGIP. Customers must agree to maintain the firm service level at or above capacity of the proposed generating system for the

duration of the applicable warranty period. Customers may submit a letter requesting an exemption to the firm service rule if they plan to terminate or reduce a portion of their interruptible load. *Wind and energy storage projects need not abide by this portion.*

- Publicly-owned or investor-owned gas, electricity distribution utilities or any electrical corporation (ref. Public Utility Code 218) that generates or purchases electricity or natural gas for wholesale or retail sales.

6.5 Eligible Fuel Requirements

Eligible fuels are those that produce useful energy when undergoing combustion or a chemical reaction and are classified as renewable, non-renewable, or blended.⁵⁹

6.5.1 Renewable Fuel Blending Requirements

All gas generation technologies are required to blend a minimum amount of renewable fuel beginning in 2017. The minimum percentage is determined by the year in which the application is accepted. The table below incorporates the minimum renewable fuel blending requirements by application year.

Table 6.5.1: Minimum Renewable Fuel Blending Requirement

Application Year	% Renewable Fuel Required
2016	0%
2017	10%
2018	25%
2019	50%
2020	100%

6.5.2 Directed Biogas Project Requirements

Directed biogas projects must meet the following eligibility requirements and conditions:

- Directed renewable fuel must be injected into a common carrier pipeline system that is either within the Western Electricity Coordinating Council (WECC) region or interconnected to a common carrier pipeline system located within the WECC region.

6.5.3 Directed Biogas Renewable Fuel Audits

Program Administrators or a third-party designee will conduct an annual audit of the renewable fuel invoices for ten years after the renewable fuel contract commences to verify renewable fuel consumption.

The audit and verification will use metered fuel consumption data for SGIP directed biogas projects; invoices from SGIP participants for directed renewable fuel purchases; documentation/verification on

⁵⁹ For the purposes of SGIP, renewable resources such as wind, pressure, waste heat, and water are not categorized as a fuel.

any deliveries of directed renewable fuel along the path from the SGIP participant back to the original directed renewable fuel supply source; and documentation to verify the amount and energy content of directed renewable fuel injected into the path. To complete the audit, the Program Administrator or a third-party designee will request all pertinent information from the system owner and/or renewable fuel provider at the completion of each year after renewable fuel contract start date.

If invoices show that nominated renewable fuel deliveries fell below the generator's committed renewable fuel demand during any 1 year period, the SGIP Program Administrators may request that the system owner refunds the appropriate renewable fuel SGIP incentive amount and reserve the right to request a refund of additional costs associated with the administrative and legal fees incurred by the Program Administrators.

6.5.4 ***Renewable Fuel Commitment Modifications***

Customers are required to meet their renewable fuel commitment throughout the permanency period. In the event that modifications are made applicants are required to notify their Administrator.

- **Modifications Pre-ICF** – applicants must notify their administrator as soon as practical but no later than ICF. Increase of renewable fuel percent prior to the completion of the project may not automatically increase incentive amount.
- **Modifications Post-ICF** – applicants must notify their Administrator within 90 days of any changes made to the contract and amount of renewable fuel. Increase in amount of renewable fuel may not result in an incentive increase. Additionally, the host customer must provide to the Program Administrator with all pertinent documentation.

6.5.5 ***Pressure Reduction Turbine Requirements***

Pressure reduction turbines operating in a steam system the boiler fuel used to generate the steam may be blended or 100% renewable, and as such would be eligible for the renewable fuel adder. The source of the renewable fuel may be on-site or directed. The temperature and flow rate of steam to the pressure reduction turbine will be used along with the boiler efficiency to determine the amount of fuel used to generate steam supply to the turbine. The adder would apply only to the renewable fraction of the boiler fuel necessary to operate the pressure reduction turbine.

6.6 **Incentive Calculation for Generation Projects**

Incentives for a proposed generation system are calculated by multiplying the rated capacity (W) of the system⁶⁰ by the incentive rate for the appropriate technology type and step.

$$\text{Incentive} = \text{rated capacity} * \text{incentive rate}$$

⁶⁰ For more information on rating criteria for system output, see *Section 6.1.5*.

Incentives for 100% renewable and blended fuel projects are calculated by multiplying the rated capacity of the system by the technology incentive rate, plus the rated capacity of the system, multiplied by the percentage of renewable fuel above the minimum requirement, multiplied by the renewable fuel adder rate (\$.60/watt).

Incentive = (rated capacity * incentive rate) + (rated capacity * % above min RN Fuel * RN incentive)

6.6.1 **Incentive Declines Based on Generation Capacity**

SGIP incentives are paid for up to 3 MW of capacity with tiered incentive rates. For projects that are greater than 1 MW, the incentives identified in Table 3.1.1 decline according to the following schedule:

Table 6.6.1: Tiered Incentive Rates

Capacity	Incentive Rate (Pct. of Base)
0 – 1 MW	100%
>1 MW – 2 MW	75%
>2 MW – 3 MW	50%

6.7 **Performance-Based Incentive Payment (PBI)**

On-site biogas, wind, waste heat to power and pressure reduction turbine projects 30 kW and larger will be paid 50% of the full incentive amount upon project completion and Post-Installation Inspection. The remaining 50% of the incentive will be paid annually over five years. Annual payments will be structured so that based upon the expected capacity factor and renewable fuel commitment (if applicable) a project would receive the entire stream of performance payments in five years.

\$/kWh = remaining 50% of incentive / total anticipated kWh production

Total anticipated kWh production = rated capacity * anticipated capacity factor * hours per year * five years

For a 5-year period the PBI payment will be paid annually based on recorded kWh of electricity produced or offset over the previous 12 months.

PBI Payment = *\$/kWh* * actual annual kWh

Directed biogas projects 30 kW and larger will be paid 50% of the technology incentive upon project completion and Post-Installation inspection. The remaining 50% of the technology incentive will be paid annually over five years. Annual kilowatt hour-based technology payments will be structured so that

under the expected capacity factor, a project would receive the entire stream of performance payments in five years. Additionally, the renewable fuel adder will be paid annually over five years. Annual renewable fuel adder payments will be structured so that, under the expected fuel consumption, a project would receive the entire renewable fuel adder for which it was approved.

$\$/kWh = \text{remaining } 50\% \text{ of technology incentive} / \text{total anticipated kWh production over 5 years}$

$\text{Total anticipated kWh production} = \text{rated capacity} * \text{anticipated capacity factor} * \text{hours per year} * \text{five years}$

For a 5-year period the PBI payment will be paid annually based on recorded kWh of electricity produced over the previous 12 months.

PLUS

$\text{Renewable Incentive Annual Payment} = ((\text{rated capacity} * \% \text{ above min RN fuel} * \text{RN adder rate}) / 5) * (\text{actual capacity factor} / \text{anticipated capacity factor})$

Both on-site and directed biogas projects will receive a prorated PBI payment for the percentage of renewable fuel that is actually consumed.

6.7.1 PBI Payments for Export to the Grid Projects

SGIP projects that qualify for the feed-in tariff are allowed to export a percentage of their output to the grid. Once on-site electric load has been met, excess generation of electricity may be exported to the grid. The amount exported to the grid is not to exceed 25% of on-site consumption on an annual basis.

In cases where a customer is exporting electricity to the grid, the PBI payment will be calculated based on generated electricity consumed on-site as opposed to the generating system's output.

Based on this description and the \$/kWh calculated during the incentive claim step of the project, the calculation of a PBI payment is as follows:

$PBI = \$/kWh * \text{generated electricity consumed on-site}$

Program Administrators must be informed of arrangements made with the utility for sale of excess generation. For verification purposes, proof of export documentation may be required prior to payment.

6.8 Renewable Fuel Annual Payment Requirements

The following outlines the data and verification requirements for directed and on-site renewable fuel annual payments of systems 30kW and larger.

6.8.1 Directed Renewable Fuel Verification

The amount of directed renewable fuel procured will be verified prior to issuing annual fuel payments. For Directed Renewable Fuel users, applicant or Performance Data Provider (PDP) must provide monthly data of the amount of directed renewable fuel consumed on a monthly basis. This information must be provided

through the SGIP database as part of the performance data requirements. Additionally, the applicant or PDP will be required to provide the source, path, and destination of the renewable fuel. Data reporting will commence one month after the initial payment. The following information and documentation must be provided on a monthly basis:

1. Transportation Path and Energy Accounting

The PDP must upload supporting documentation (i.e. invoices) reporting the amount of renewable fuel that was documented on the Directed Renewable Fuel Verification Form. Supporting documentation includes but not limited to:

- Documentation from the source showing the amount of directed biogas being moved onto the pipeline. Any non-renewable gas added at the source must be identified.
- Documentation from the gas transmission system showing:
 - Receipt of directed biogas (from source, storage, or other pipelines)
 - Pipeline losses or fees paid in gas (not carried over)
 - Positive or negative imbalances (carried over)
 - Delivery of directed biogas to either another pipeline, storage facility, or California utility receipt point

2. Gas Fuel Consumption

The PDP must provide gas fuel consumption documentation from the gas utility matching the directed renewable fuel receipts reporting the metered total energy input to the generator. Utility gas fuel consumption receipts must be reported on a quarterly basis.

It is the responsibility of the PDP to supply the renewable fuel use documentation and to ensure that the renewable fuel is reported to the Program Administrator or their designee on a monthly and quarterly basis for five years.

6.8.2 On-site Renewable Fuel Verification

All on-site renewable fuel projects 30 kW and larger are required to install a fuel metering system that reports both renewable and non-renewable fuel. The PDP is required submit both renewable and non-renewable fuel data on a monthly basis.

The System Owner must provide make, model, specifications, and serial number of installed revenue grade gas meters

It is the responsibility of the system owner to contract with a performance data provider (PDP) for a minimum of five years and ensure that both renewable and non-renewable fuel data is provided to the Program Administrator or their designee monthly for five years.

6.9 Incentive Limitations for Projects using Renewable Fuel

The following sections outline the incentive limitations for projects using renewable fuel. Additionally, all generation projects are subject to the general incentive limitations as outlined in *Section 3.2*.

6.9.1 Limitations on PBI based on GHG Emissions Reductions

PBI payments will be reduced or eliminated in years that do not result in the required GHG emissions reductions. Because many factors may lead to a project performing below expected levels of efficiency, there is a 5% exceedance band before penalties are assessed.⁶¹ The following example describes how a PBI payment for a 2017 project would be affected:

- PBI payments will be reduced by half in years where a project's cumulative emission rate is equal to or greater than 364 kg CO₂/MWh (i.e., 5% higher than 347 kg CO₂/MWh) but less than 382 kg CO₂/MWh (i.e., 10% higher than 347 kg CO₂/MWh).
- Projects that equal or exceed a cumulative emissions rate of 382 kg CO₂/MWh will receive no PBI payments for that year.

$$\text{emission rate} < 364 \frac{\text{kg CO}_2}{\text{MWh}} \rightarrow \text{No penalty assessed on PBI payment}$$

$$364 \frac{\text{kg CO}_2}{\text{MWh}} \leq \text{emission rate} < 382 \frac{\text{kg CO}_2}{\text{MWh}} \rightarrow \text{PBI payment reduced by 50\%}$$

$$\text{emission rate} \geq 382 \frac{\text{kg CO}_2}{\text{MWh}} \rightarrow \text{No PBI payment for that year}$$

The table below illustrates the eligibility emission factors for blended fuel generation projects for the years 2017 through 2020:

Table 6.9.1: Eligibility Emission Factors for Blended Fuel Generation Projects

Program Year	Eligibility Emission Factor	Year 1 to 5
2017	Baseline	347
	5% Exceedance	364
	10% Exceedance	382
2018	Baseline	344
	5% Exceedance	361
	10% Exceedance	378
2019	Baseline	340
	5% Exceedance	357
	10% Exceedance	374

⁶¹ D.11-09-015, §4.3.2. pg 32

2020	Baseline	337
	5% Exceedance	354
	10% Exceedance	371

6.9.2 Limitations on PBI Adjustments based on Renewable Fuel Verification

All gas generation technologies must meet minimum renewable fuel requirements to be eligible for incentives. However, the annual renewable fuel PBI payment will be adjusted according to the verified consumption. PBI projects whose annual consumption fails to meet the minimum renewable fuel requirement, will forfeit the annual renewable fuel adder payment.

6.9.3 Incentive Limit for the Renewable Fuel Adder

In the case of directed projects, the adder is compared to the cost of the renewable fuel contract and should not exceed the cost difference between the renewable fuel contract and a similar contract for standard natural gas. Projects utilizing 100% on-site renewable fuel will receive the full renewable fuel adder. Projects utilizing blended fuel, where renewable fuel is either on-site or directed, the incentive will be prorated to the percentage of fuel that is actually consumed based on audits which are conducted throughout the PBI period.

6.9.4 Blended Fuel Generating Systems Converted to 100% Renewable Fuel

Blended SGIP-funded generating systems can be converted to 100% renewable fuel and receive the additional renewable fuel adder if the conversion takes place no later than 1 year from the first SGIP incentive payment. However, these conversions are only eligible to receive the additional renewable fuel adder; and all project costs caps are still applicable.

For systems under 30kW the renewable fuel adder will be paid upon completion of conversion. For systems 30kW and larger, 50% will be paid upon completion, and the remaining 50% will be included in the annual PBI payments. The recalculated PBI incentive payments will be based on the following calculation:

$$\text{PBI Rate (\$/kWh)} = \frac{\text{(remaining Incentive (\$))} + \frac{1}{2} \text{ RN fuel adder} \times \text{Rated Capacity (kW)} \times (1000\text{W/kW})}{\text{(rated capacity of the generator (kW))} \times 8760 \text{ (hrs/year)} \times \text{capacity factor} \times \text{number of years payments will be made}}$$

6.9.4.1 Renewable Fuel Conversion Reservation Request

All renewable conversion reservation requests will follow a 2-step process and must include the following applicable documents (see *Section 6.10.1* & *Section 6.10.2* for document details):

1. Reservation Request Form Application Fee
2. Proof of Adequate Renewable Fuel

6.9.4.2 Renewable Fuel Conversion Incentive Claim

Once the conversion has been completed, applicants are required to submit an Incentive Claim Form with the following applicable documents (see *Section 6.10.3* for document details):

1. Final Permits
2. Substantiations:
 - a. Renewable fuel (on-site renewable fuel)
 - b. Fuel Cleanup Skid Cost Documentation (on-site renewable fuel only)
 - c. Renewable Fuel Documentation & Contract Commencement (directed renewable fuel only)
 - d. Renewable fuel metering specifications
3. Final Monitoring Schematic (for projects that are 30 kW or larger) to include the name of the Performance Data Provider (PDP).

6.10 Application Documentation Requirements for Generation Projects

Applications are required to meet all documentation requirements on time. Documents are based on the application timeline. The following sections describe the required documents based on the specific step.

6.10.1 *Required Documentation for Reservation Request*

Generation applications must provide a copy of the following:

Table 6.10.1: Reservation Request Requirements

Required Materials
1. Completed Reservation Request Form <i>(All Projects)</i>
2. Application Fee <i>(Non-Residential Projects only)</i>
3. Equipment Specifications <i>(All Projects)</i>
4. Proof of Utility Service/ Load Documentation <i>(All Projects)</i>
5. Preliminary Monitoring Plan <i>(All 3-Step Applications >=30 kW)</i>
6. Minimum Operating Efficiency Worksheet w/Backup Documentation <i>(Blended Projects Only)</i>
7. Proof of Adequate Fuel or Waste Energy Resource <i>(Renewable Fuel, Waste Energy, Waste Gas Projects Only)</i>

Two-Step Applications should also include all applicable Proof of Project Milestone Documents (as outlined in Section 6.10.2) as part of their Reservation Request

1. **Online Reservation Request Form** *(All Projects)*

All applicants are required to complete the online Reservation Request Form (RRF). This online form is used to provide project details, contact information, and signed declarations.

As part of the RRF the project Host Customer must attest that an Energy Efficiency Audit (EEA)⁶² has been performed for the project site and they received and reviewed the findings of the audit.

The RRF must be printed and signed by the applicant, host customer and system owner (if not host customer). A copy of the signed document must be uploaded to the online application database and the information contained on the signed copy of the RRF must match the information provided on the online RRF.

2. **Application Fee** *(Non-Residential Projects only)*

The application fee is equal to 5% of the requested incentive amount, payable by check, cashier check or money order, and should reference the project by site address.⁶³ The application fee is the only required document that must be mailed directly to the Program Administrator.⁶⁴ After a project is assigned to an incentive step, the application fee check must be mailed within 7 calendar days. If the check is not mailed within 7 calendar days, the project may be cancelled. Application fee checks returned by the financial institution without payment may result in cancellation of the application.

The application fee will be refunded upon completion and verification of the installed SGIP project. Prior to project completion, application fees are non-refundable once a Confirmed Reservation has been issued.⁶⁵ All forfeited application fees will be allocated to the Program Administrator's current incentive step.

3. **Equipment Specifications** *(All Projects)*

Manufacturer equipment specifications for all major components of the system are required, in addition to the nameplate capacity, rated capacity (kW) efficiency and, if necessary, fuel consumption and waste heat recovery rate of the system.

Proof of power factor eligibility is also required for microturbines, internal combustion engines, gas turbines and stream turbine CHP applications (where applicable) and must include self-generating

⁶² An Energy Efficiency Audit (EEA) report issued within the past five years. A Title 24 energy efficiency compliance report issued within the past three years may also be used in lieu of an Energy Efficiency Audit.

⁶³ Application fees are specific to an application, not a site. If the same site reapplies to the program, they will need to submit a new application fee.

⁶⁴ A single application fee check for each project is required.

⁶⁵ Application Fees will not be altered due to project changes that may result in a different incentive.

facility design specifications and/or manufacturer's specifications which show that the system will be capable of operating between 0.95 PF lagging and 0.90 PF leading.

4. **Proof of Utility Service & Load Documentation** *(All Projects)*

Participation in the SGIP is restricted to customers who are located in PG&E, SCE, SoCalGas or SDG&E service territories and physically connected to the Electric Utility transmission and distribution system. All applications must include a copy of a recent electric utility bill indicating the account number, meter number, site address, and Host Customer name. Customers applying in PG&E and SoCalGas territory must also submit a copy of a recent gas utility bill. For new construction, the Host Customer must submit confirmation from the serving utility that their site is within the Program Administrator's service territory. For projects applying in CSE and SoCalGas territory, applications for technologies that discharge electricity to the onsite load must include a copy of the previous 12-months of electric consumption including maximum demand and kWh consumption to confirm that the participating generation system meets the program sizing requirements. Electric utility customers of SCE and PG&E are not required to submit their 12 month electric consumption and demand data. SDG&E customers are also required to submit an Authorization to Receive Customer Information form, signed by the utility customer of record that authorizes CSE to access utility account information for systems greater than 10 kW or any other instance under CSE discretion if needed.

If the generation system is being sized based on new or future load growth (i.e. new construction or load growth due to facility expansion or other load growth circumstances) applications must include an engineering estimate with appropriate substantiation of the site's annual peak demand forecast. Suggested methods of demonstrating load growth include Application for Service with corresponding equipment schedules and single line diagram; building simulation program reports such as eQUEST, EnergyPlus, EnergyPro, DOE-2, and VisualDOE; or detailed engineering calculations.

5. **Preliminary Monitoring Plan** *(All 3 Step Applications ≥ 30 kW)*

The preliminary monitoring plan should demonstrate the following components:

Description of the proposed SGIP system:

Description of the system with an overview of the energy services to be provided (e.g., generation, waste heat recovery, storage, etc.) by the system to the host site; the major components making up the system; and the general operating schedule of the system (e.g., is it 24x7x365 or 10x6x365, etc.); Include photos of the system if available.

Break out subsystems such as waste heat recovery systems in order to provide context for thermal energy metering systems. Provide similar descriptions for other important subsystems such as energy storage when combined with wind systems.

A description of the existing load at the Site and identification of the sources of the fuel that would be displaced by operation of the SGIP system (i.e., electricity provided by XYZ utility or natural gas provided by ABC utility) and photos of the interface locations where the SGIP system would be located to displace the load.

Description of the metering system and metering approach:

An overview of the performance data to be collected (e.g., electrical, useful thermal energy, fuel consumption, etc.) and a simplified layout of the system showing major components (e.g. generator, waste heat recovery, storage etc.) and location of the proposed metering points and data to be collected at those points (i.e. electrical, flow, temp, fuel etc.) is required.

Two Step Applications will include (as part of their Reservation Request) a Proposed Monitoring Plan as outlined in *Section 6.10.2*.

6. Minimum Operating Efficiency Worksheet w/Backup Documentation (Blended Projects Only)

The Minimum Operating Efficiency Worksheet (MOEW) is used to evaluate a project's technical ability to meet the following requirements:

- a) Minimum operating efficiency requirement which can either be satisfied by meeting:
 - Waste Heat Utilization or
 - Minimum Electrical Efficiency Requirements
- b) Thermal Load Coincidence
- c) CHP System Efficiency and NOx Emission Qualification
- d) Greenhouse Gas Emission Standard
- e) Electrical Load Coincidence (Electrical Export Eligibility)

a) Minimum Operating Efficiency Calculations

The MOEW is a spreadsheet used to evaluate the project's estimated minimum operating efficiency over 10-years. Additionally, the MOEW verifies the first year minimum operational efficiency for Electric-only fuel cells. All applications proposing blended renewable-fueled technologies must provide backup documentation along with the MOEW. CHP systems must additionally include engineering calculations with documented assumptions regarding the site's thermal load. All assumptions, backup documentation, hand calculations, models (with inputs and outputs) and custom spreadsheets used to develop the forecasts must be included in the documentation. Forecasts based solely on "professional experience" or subjective observation will be rejected.

Specifically, the following applicable documentation must be provided:

- *Generator & Thermal System Description*

The application must include the performance and capacity specifications for the proposed CHP system and all thermal system equipment that the CHP system interacts with or serves. This includes but is not limited to the generator system, heat recovery system, heat exchangers, absorption chillers, boilers, furnaces, etc. In addition, a thermal process diagram must be provided as part of the documentation package that shows the configuration of the generator(s), heat recovery system, pumps, heat exchangers, thermal load equipment, and the working fluid flow and temperatures in/out of each piece of major equipment at design conditions.

- *Forecast of Generator Electric Output*

The MOEW must include a forecast of the monthly generator electric output (kWh/month) for a twelve-month period. The generator electric output forecast must be based on the operating schedule of the generator, historical or site electric load forecast and maximum/minimum load ratings of the generating system; exclusive of any electric energy used in ancillary loads necessary for the power production process (i.e., intercooler, external fuel gas booster, etc.).

- *Forecast of Generator Thermal Output*

The application must include a forecast of the monthly generator thermal output (Btu/month) for a twelve-month period. The generator thermal output forecast must be based on the electric output forecast of the generating system and the waste heat recovery rate specifications of the system.

- *Forecast of Generator Fuel Consumption*

The application must include a forecast of the generating systems monthly fuel consumption (Btu/month) for a twelve-month period. The generator's fuel consumption forecast must be based on the generating system electric output forecast and the systems fuel consumption specifications.

- *Forecast of Thermal Load Magnitude*

The application must include a monthly Thermal Load forecast (Btu/month) for a twelve-month period for the Thermal Load served by the CHP system. The forecast must be based on engineering calculations, thermal system modeling, historical fuel billing, measured data or a combination of these methods. The Thermal Load forecast must be independent of the generator operation forecast. If historical natural gas or other fossil fuel consumption records (e.g., billing records) are used, the combustion efficiency of the natural gas or fossil fuel fired equipment that is being displaced must be included.

Historical fuel consumption must be discounted to account for equipment Thermal Load that will not be displaced by the prime mover's thermal energy.

- *Forecast of Useful Thermal Output*

The useful thermal output of the CHP system will be the lesser of the Thermal Load forecast, or the prime mover's thermal output coincident with the Thermal Load. The useful thermal output is the value used in calculating the P.U. Code 216.6 requirements.

b) Thermal Load Coincidence

Thermal load coincidence is calculated in the worksheet by comparing the waste heat recovered to the thermal load on an annual basis. The backup documentation listed above for the forecast of generator thermal output and forecast of thermal load magnitude will be sufficient to meet this operating efficiency requirement.

c) CHP System Efficiency and Proof of NOx Emission Qualification

Applications must include documentation substantiating that the generating system meets or exceeds the 60% minimum system efficiency and NOx emissions are at or below the applicable emission standard. One of the following documents must be included to determine the NOx emissions (lb/MWh) of the proposed system:

- Manufacturer emission specifications based on factory testing using California Air Resources Board (CARB), EPA or local air district test methods⁶⁶ for the proposed generating system as configured for the Site.
- CARB distributed generation certification
- Emission engineering calculations for the proposed generating system as configured for the site.

Conversion of emissions concentration (ppm) to production based emissions rates (lb/MWh) shall use the method found in Appendix C of this Handbook. Units that do not pass the emission standard may use emission credits. If the application claims NOx emissions credits for their waste heat utilization emission, credit calculation documentation based on the amount of waste heat utilized over a twelve-month period must be provided.

d) Greenhouse Gas Emission Rate Testing Protocol (*Electric-Only Fuel Cells*)

Electric-only fuel cells operating on blended fuel must provide the ASME PTC 50-2002 test as backup documentation to the MOEW. Please see *Section 6.1.3* for further information.

e) Electric Load Coincidence (*Electrical Export Eligibility*)

⁶⁶ Acceptable test methods include but not limited to CARB Test Method 100 and USEPA Test Method 7.

The application must include the monthly electrical load for the previous 12 months. This information will be used in the MOEW to determine electrical load coincidence with electrical generation on an annual basis. If the generator is eligible to export electricity to the grid, the electrical generation will be compared to 125% of electrical load on an annual basis.

7. **Proof of Adequate Fuel or Waste Energy Resource (Renewable Fuel, Waste Gas & Waste Energy Projects)**

On-site Biogas Projects must include an engineering survey or study confirming the renewable fuel (i.e., adequate flow rate) and the generating system's average capacity during the term of the Project's required permanency period.

Biogas Projects utilizing Directed Renewable Fuel must include documentation of the forecasted fuel consumption of the generator over the life of project.

Projects utilizing Waste Gas Fuel (microturbines, internal combustion engines, gas turbines and steam turbine CHP waste gas fuel applications only) must include an engineering survey or study confirming that there is adequate on-site waste gas fuel (i.e., adequate flow rate) for continuous operation of the self-generation unit for the term of the project's required permanency period.

Proposed Pressure Reduction Turbine applications must include an engineering survey or study confirming adequate temperature, pressure and flow within the piping system, and the generating system's rated capacity. The rated capacity must be based upon the average pressure drop across and flow through the turbine, when flow exists, as determined by historical flow and pressure data from the previous year if available, or from an engineering estimate if new construction or expanded load. Additionally, the survey or study must show that the capacity factor for the proposed project will be greater than or equal to 40% based upon conditions over the course of a full year, or from an engineering estimate for future conditions.

Proposed Waste Heat to Power applications must include an engineering survey or study confirming adequate waste heat production rate and temperature, and the generating system's rated capacity. The rated capacity must be based upon the average waste heat production rate and temperature, when waste heat is available, as determined by historical waste heat and temperature data from the previous year if available, or from an engineering estimate if new construction or expanded load. Additionally, the survey or study must show that the capacity factor for the proposed project will be greater than or equal to 40% based upon conditions over the course of a full year, or from an engineering estimate for future conditions.

Proposed Wind projects must include an engineering survey or study evaluating the annual average wind speed at the hub height of the wind turbine. The study must confirm that the average annual wind speed is equal to or greater than 10 mph (4.5 m/s). The wind resource can be verified using wind resource maps from NREL or the CEC and standard formulas for correcting for differences in tower heights or by gathering wind data on site at the turbine's proposed hub height for one year.

Additional Requirements for Two Step Applications

All 2 step applications must include as part of their Reservation Request materials, all applicable requirements of the Proof of Project Milestone. See Section 6.10.2.

6.10.2 Required Documentation for Proof of Project Milestone

Generation applications must provide a copy of the following:

Table 6.10.2: Proof of Project Milestone Requirements

Required Materials
1. Completed Proof of Project Milestone Form <i>(All 3-Step Projects)</i>
2. Copy of RFP or equivalent after 90 days <i>(Public Entity Projects Only)</i>
3. Copy of Executed Contract or Agreement for Installation <i>(All Projects)</i> <ul style="list-style-type: none"> • Includes Required Warranty Documentation
4 Proposed Monitoring Plan <i>(All Projects >=30 kW)</i>
5. Proof of Fuel Contract and Documentation <i>(Renewable Fuel and Waste Gas Projects Only)</i> <ul style="list-style-type: none"> • Renewable Fuel Contract <i>(Directed Renewable Fuel Only)</i> • Directed Renewable Fuel Attestation – System Owner & Fuel Supplier <i>(Directed Renewable Fuel Only)</i> • Renewable Fuel Affidavit <i>(On-site Renewable Fuel Only)</i> • Fuel Clean-up <i>(On-site Renewable Fuel Only)</i> • Waste Gas Fuel Affidavit <i>(Waste Gas Fuel Only)</i>

1. Online Proof of Project Milestone Form *(All 3-Step Projects)*⁶⁷

The Online Proof of Project Milestone Form must be completed and signed by the applicant and representatives with signature authority for both the system owner and host customer (if not host customer). The online form must identify updated project information including the installation contractor's name, telephone number and contractor license number. All systems must be installed by an appropriately licensed California contractor in accordance with rules and regulations adopted by the State of California Contractors' State Licensing Board. Installation contractors must have an active A, B, or C-10 license.

⁶⁷ Not required for 2-Step Applications as part of the Reservation Request Package.

2. **Request for Proposals (RFP) Documentation (Public Entities Only)**

Notice to Invite Bids, or similar solicitation issued for the installation, lease and/or purchase for systems proposed for the SGIP. The RFP must include sufficient project details such as the scope of work, schedule, terms, budget, and/or system components desired. For Public Entities not issuing an RFP, alternative documentation such as an executed letter of intent to engage with a contractor on the Host Customer letterhead, an executed contract/agreement for system installation/lease, an equipment purchase order, or alternate system ownership agreement must instead be submitted within 90 calendar days of the date the Conditional Reservation Letter. Proof of Project Milestone documentation must then be submitted within 240 days of the date the Conditional Reservation Letter.

3. **Executed Contract and/or Agreement for System Installation (All Projects)**

A copy of the executed contract for purchase and installation of the system, and/or alternative System Ownership Agreement (such as a Power Purchase Agreement) is required. The contract/agreement must be legally binding and clearly spell out the terms and scope of work. Purchase and/or installation agreements must also include system equipment and eligible system costs. All contracts/agreements must be signed by appropriate representatives (Host Customer, Installer, and/or System Owner) who are a party to the agreements of the SGIP reservation.

- As part of the Executed Contract, all generation systems are required to include a minimum 10 year service warranty (with the exception of wind turbines which must have a minimum 20 year service warranty). A service warranty ensures proper maintenance and continued project performance. The service warranty must cover the system maintenance to include (but not limited to) system support, problem diagnosis, on-site repair and preventative maintenance. The warranty should also include language to guarantee the continued performance of the system over the warranty period. The system owner must provide proof of warranty and maintenance contract, and specify the warranty and maintenance contract start and end dates.

4. **Proposed Monitoring Plan (All Projects that are 30 kW or larger)**

The proposed monitoring plan should demonstrate the following components:

Description of the proposed SGIP system(s)

Description of the system(s) with an overview of the energy services to be provided (e.g., generation, waste heat recovery, storage, etc.) by the system(s) to the host site; the major components making up the system(s); and the general operating schedule of the system(s) (e.g., is it 24x7x365 or 10x6x365, etc.). Include photos of the system(s) if available.

Break out subsystems such as waste heat recovery systems in order to provide context for thermal energy metering systems. Provide similar descriptions for other important subsystems such as energy storage when combined with wind systems.

A description of the existing load at the Site and identification of the sources of the fuel that would be displaced by operation of the SGIP system(s) (i.e., electricity provided by XYZ utility or natural gas provided by ABC utility) and photos of the interface locations where the SGIP system would be located to displace the load.

Description of the metering system and metering approach

An overview of the performance data to be collected (e.g., electrical, useful thermal energy, fuel consumption, etc.) and a simplified layout of the system showing major components (e.g., generator, waste heat recovery, storage, etc.) and location of the proposed metering points and data to be collected at those points (i.e., electrical, flow, temp, fuel, etc.) is required.

Description of the approach to be used for collecting, storing and transferring the necessary performance data

- For example, if useful thermal energy data is to be collected, the reasoning behind the selected metering points
- Frequency with which the data is to be collected (e.g., 15 min intervals)
- Data storage capability and approach for transfer of data (e.g., cell modem) and frequency of reporting to PDP (e.g., daily, weekly) [this could also include frequency for reporting of data to Program Administrators, such as monthly]

Identification of the metering system components by performance data type (including manufacturer and model number)

- Electrical metering equipment (AC meters must be listed on the CEC's list of Eligible System Performance and Revenue Grade Meters to be found on <http://www.gosolarcalifornia.ca.gov/equipment/index.html>)
- Thermal energy metering equipment
- Fuel consumption metering equipment
- Data acquisition (i.e., logger) system

5. **Proof of Fuel Contracts and Documentation** *(Renewable Fuel and Waste Gas Projects Only)*

Copy of Executed Renewable Fuel Contract *(Directed Renewable Fuel Only)*

The Contract should at a minimum include term (minimum of 10 years), cost, amount of renewable fuel injected on a monthly basis for the length of the contract, address of renewable fuel facility, location of pipeline injection site, name of pipeline owner, and facility address of Host Customer.

The SGIP Program Administrator or designee has the right to audit and verify the generator's renewable fuel consumption upon request over the life of the contract.

The Host Customer will consume the contracted renewable fuel for the sole purpose of fueling the SGIP project and the contract should include a forecast for the system's anticipated fuel consumption.

The contract should include a quarterly true-up mechanism in which the customer and renewable fuel supplier agree to true-up based on actual deliveries of renewable fuel. Note that the fleet of SGIP systems will have its own revenue-grade, electric NGOM and gas meters that are accessible via internet by the Program Administrator or designee.

- If less on-site fuel is consumed than renewable fuel is nominated into the pipeline, then parties agree to a financial make-whole provision.
- If more on-site fuel is consumed than renewable fuel is nominated into the pipeline, then parties agree to a make whole provision, such that Customer Generator consumes renewable fuel, as measured annually.

Directed Renewable Fuel Attestation (*Directed Renewable Fuel Only*)

Attestation letter from the system owner of the intent to notionally procure renewable fuel and attestation from the fuel supplier that the fuel meets the applicable renewable portfolio standard eligibility requirements for renewable fuel injected into a natural gas pipeline.

Renewable Fuel Use Affidavit (*On-site Renewable Fuel Only*)

Application documentation must include a signed affidavit that projects will not switch to non-renewable fuel for a period of ten years for all technologies. The SGIP Program Administrator has the right to audit and verify the generator's renewable fuel consumption upon request over the life of the contract.

Fuel Cleanup Equipment Purchase Order (*On-site Renewable Fuel Only*)

When applicable, application documentation must include a purchase order for Renewable Fuel cleanup equipment that lists the fuel cleanup equipment as a separate invoice item.

Waste Gas Fuel Use Affidavit (*Waste Gas Only*)

When applicable, application documentation must include a signed affidavit that Projects will be fueled solely (100%) with Waste Gas for a period of ten years.

6.10.3 Required Documentation for Incentive Claim

Generation applications must provide a copy of the following:

Table 6.10.3: Incentive Claim Requirements

Required Materials	
1.	Completed Incentive Claim Form <i>(All Projects)</i>
2.	Proof of Authorization to Interconnect <i>(Projects that interconnect with the electrical grid)</i>
3.	Final Permits <ul style="list-style-type: none"> • Building Permit Inspection Report <i>(All Projects)</i> • Air Permit Documentation <i>(Non-Renewable Fuel Only)</i>
4.	Substantiations: <ul style="list-style-type: none"> • New or Expanded Load <i>(All Projects)</i> • Renewable or Waste Resource <i>(On-site Renewable Fuel and Waste Energy Only)</i> • Fuel Cleanup Skid Cost <i>(On-site Renewable Fuel Only)</i> • Renewable Fuel Documentation/Contract Commencement <i>(Directed Renewable Fuel Only)</i> • Renewable Fuel Metering Specifications <i>(Directed Renewable Fuel Only)</i>
5.	Planned Maintenance Coordination Letter <i>(>=200 kW CHP Systems Only)</i>
6.	Final Monitoring Schematic <i>(All Projects)</i>
7.	PBI Setup Sheet <i>(All Projects >= 30kW)</i>

1. **Online Incentive Claim Form** *(All Projects)*

The ICF information must be complete, accurate and represent the actual system, project costs, and/or fuel information as installed (including system size and type). It must also be signed by the applicant, host customer and system owner (if not the host customer).

2. **Proof of Authorization to Interconnect** *(Projects that interconnect with the electrical grid)*

Host customers and/or system owners will be required to execute certain documents such as, but not limited to, an “Application to Interconnect a Generating Facility” and a “Generating Facility Interconnection Agreement” with the local Electric Utility. A copy of the signed letter from their Electric Utility granting the host customer and/or system owner permission to interconnect and operate in parallel with the local grid should be submitted as proof of Authorization to Interconnect.

Applicants, host customers and system owners are solely responsible to submit interconnection applications to the appropriate electric utility interconnection department as soon as the information to do so is available to prevent any delays in system parallel operation.

3. **Final Permits**

Building Inspection Report *(All Projects)*

A copy of the final building inspection report (or proof of exemption) demonstrating that the Project meets all codes and standards of the permitting jurisdiction. Contact your local permitting jurisdiction to learn about permitting requirements.

Air Permitting Documentation *(Non-Renewable Fuel Only)*

For those Projects that require an air permit from the local air district, the application must include a copy of the final documentation indicating compliance with all applicable air pollution regulations (or proof of exemption).

4. **Substantiations:**

New Construction or Added Load *(All Projects)*

For Projects where host customer estimated the future load to justify system size, applications must include documentation demonstrating that the load forecast has materialized.

Renewable Fuel or Waste Energy Resource *(On-site Renewable Fuel and Waste Energy Only)*

For Projects where the host customer, applicant or system owner provided renewable fuel estimates or Waste Energy resource estimates, applications must include documentation demonstrating that the on-site Renewable Fuel or Waste Energy resource has materialized.

Fuel Cleanup Skid Cost Documentation *(On-site Renewable Fuel Only)*

On-site biogas projects must include documentation substantiating the fuel cleanup skid cost.

Renewable Fuel Documentation & Contract Commencement *(Directed Renewable Fuel Only)*

Documentation from the supplier showing that the fuel is renewable and that it meets the quality standards to be injected into the local natural gas pipeline. Documentation should also be submitted showing that the contract has commenced and the supplier has begun nominating the renewable fuel into the pipeline (e.g. one month fuel invoice). The project will be given up to one year from the date the Incentive Claim was received by the SGIP Program Administrator for commencement of the contract. However, no incentive will be paid until the contract has commenced.

Renewable Fuel Metering Specifications *(Directed Renewable Only)*

Documentation should also be provided to include make, model, specifications and serial number of installed revenue grade electric NGOM and gas meters.

5. **Planned Maintenance Coordination Letter** *(CHP Projects \geq 200 kW Only)*

When applicable, applications with microturbine, internal combustion engine, gas turbine and steam turbine CHP systems operating on blended fuel sized greater than 200 kW must include a maintenance coordination letter to the host customer's electric utility. The maintenance coordination letter shows the system owner will schedule planned maintenance only between October and March and, if necessary, only during off-peak hours and/or weekends during the months of April to September.

6. **Final Monitoring Schematic** *(All Projects)*

The final monitoring schematic includes an electrical single line diagram (SLD) that includes the generator, the utility meter, and the load panel, and if applicable, the PBI meter. CHP projects must also include a Process and Instrumentation Diagram (P&ID) that shows the configuration of the generator(s), heat recovery system, pumps, heat exchangers, and thermal load equipment as well as the fuel and thermal metering points. Documentation must also be provided if there is a change in the make and model of the meters to be used (from what was submitted with the Proposed Monitoring Plan at the Proof of Project Milestone).

For PBI projects, the applicant must also provide the name of the Performance Data Provider (PDP) they are contracting with. A copy of the contract between the PDP and the applicant may be requested at the Program Administrator's discretion.

8. PBI Setup Sheet (for projects 30 kW or larger)

The PBI setup sheet must include information for all meter(s) installed for the purpose of monitoring system performance. The meter IDs listed on the PBI setup sheet must also match the meter IDs specified on the Final Metering Schematic.

6.11 Metering & Monitoring Requirements for Generation Projects

All SGIP technologies 30 kW or larger must install metering and monitoring equipment that measures net electrical output from the system(s). In addition to electrical output, fuel input metering into the generator(s) is required for all conventional CHP and fuel cell technologies, regardless of fuel type. CHP technologies operating on blended fuels must also install metering and monitoring equipment that measures and reports useful thermal energy delivered to the site from the CHP system.

System owners must install and maintain metering and monitoring equipment at their own cost and are responsible for the choice and installation of the metering hardware. All AC electric meters must be listed on the CEC's list of Eligible System Performance and Revenue Grade Meters to be found on <http://www.gosolarcalifornia.ca.gov/equipment/index.html>.

It is also the responsibility of the System Owners to contract with a Performance Data Provider (PDP) for a minimum of five years. PDPs will be tasked with recording performance data from the installed metering and monitoring equipment and submit it to the Program Administrators on a monthly basis.

All installed meters (electrical, thermal and fuel) must fulfill the following requirements:

- Protocols for the minimum required performance/output data must enable any PDP to communicate with the meter and obtain the minimum required performance/output data from the meter and/or logger.
- All meters must have the capability to report their data remotely.

- Data reporting must occur on a daily basis.
- All meters must have the ability to retain collected data in the event of a power outage. Meters must have the capability to store 7 days' worth of data.
- All meters must provide the PDP provider or defined list of authorized users with the ability to access and retrieve the minimum required data from the meter using the Meter Communication / Data Transfer Protocols described in *Section 7.1*.
- The meters will be inspected as part of the project Post-Installation inspection process.

The following section details the minimum meter requirements per type of meter installed (electrical, thermal, fuel).

6.11.1 **Minimum Electrical Meter Requirements**

All systems 30 kW and larger must be installed with a meter or metering system which allows the System Owner and Program Administrator to determine the amount of net system energy production and allows the System Owner to support proper system operation and maintenance.

Electrical meters installed on the SGIP project provide data used to assess performance of the system, to analyze impact of the SGIP system on utility distribution systems, the peak system demand of the utility and net GHG emission impacts.

- **Meter Type**

All systems are allowed to use on-board electrical meters, however, the meter must meet the minimum meter requirements of this section. For all systems receiving PBI payments, the installed meter(s) may be a separate Interval Data Recording (IDR) meter(s), or a complete onboard system that is functionally equivalent to an IDR meter, recording data no less frequently than every 15 minutes. Program Administrators may have additional meter functionality requirements for systems receiving PBI payments, as the Program Administrators will use these meters to process PBI payments, and system compatibility may be required. For example, meters and service panels must meet all local building codes and utility codes. The meter serial number must be visible after installation.

- **Acceptable Electrical Metering Points**

The electrical metering system must meter delivered energy by having a meter at the output of the generator and after power delivery to all parasitic loads. When an on-board electrical metering system is used, the meter must have multiple channels in order to monitor parasitic energy consumption as well as generator output and report net generation output.

- **Meter Accuracy**

All systems receiving a PBI incentive must install a meter accurate to within $\pm 2\%$ of actual system output. This applies to on-board electrical meters as well as external IDR meters.

- **Meter Measurement and Time Granularity of Acquired Data**

Electric meters must measure the net energy generated (kWh) and net real power delivered (kW). The PDP must log all required generator performance / output data points no less frequently than once every 15 minutes. The meter needs to generate an accurate time/date stamp.

- **Meter Testing and Certification**

± 2% meters required for PBI for AC systems must be tested according to all applicable ANSI C-12 testing protocols pertaining to the monitoring of power (kW) and energy (kWh). The accuracy rating of ±2% meters must be certified by an independent testing body (i.e., a NRTL such as UL or TUV). DC electrical meters must also have a ± 2% accuracy pertaining to the monitoring of power (kW) and energy (kWh), by the meter manufacturer.

- **Meter Display**

All meters must provide a display showing the meter's measured net generated energy output or offset and measured instantaneous power. This display must be easy to view and understand and must be physically located either on the meter or on a remote device. For PBI, if a remote device is the only visible access, the PA may ask for verification.

6.11.2 **Minimum Thermal Metering Requirements**

All CHP systems 30 kW and larger running on blended fuel must be installed with a metering system which allows the System Owner and Program Administrator to determine the amount of useful thermal energy production and allows the System Owner to support proper system operation and maintenance. Thermal energy metering systems installed on the SGIP project provide data used to assess thermal performance of the system; including its ability to meet on-site thermal energy demands (thereby offsetting consumption of fossil fuels), and meet thermal energy efficiency requirements prescribed by PUC 216.6. Thermal energy performance data will also be used to assess impact of the SGIP system on net GHG emission impacts⁶⁸ and minimum system operating efficiency requirements.

- **Meter Type**

All CHP systems that are 300 kW and smaller will be allowed to use an on-board thermal metering system in order to minimize cost. The specific instrumentation required to measure useful thermal energy production will vary depending on the configuration and type of heat recovery system (e.g., liquid, steam, direct exhaust). Common flow measuring devices include insertion type or ultrasonic flow meters. Temperature measurement may be done with thermocouples. On-board thermal metering systems just as external thermal metering systems must measure useful thermal energy production. Proposed meter and sensor types shall be identified in a Monitoring Plan developed for each individual project. On-board meters must meet the same requirements as external meters which are outlined below.

⁶⁸ Thermal energy metering systems may also provide SGIP System Owners with a potential means of verifying carbon emissions and carbon emission reductions.

- **Acceptable Thermal Metering Points**

Proposed meter and sensor locations shall be identified in a Monitoring Plan developed for each individual project. It is recommended for direct exhaust combined cooling heating and power (CCHP) systems, that the chilled water output be measured, rather than measuring exhaust flows and temperatures as a way to calculate the useful thermal output.

- **Meter Accuracy**

The accuracy of the metering system for useful thermal energy production must be within $\pm 5\%$ at design conditions. This requirement applies to on-board as well as external thermal metering systems. The Monitoring Plan shall include a section describing monitoring system maintenance plans that will be implemented to ensure compliance with the accuracy requirement throughout the PBI period.

- **Meter Measurement and Time Granularity of Acquired Data**

The PDP must log all required useful heat recovery system performance / output data points no less frequently than once every 15 minutes. Calculated values of useful heat recovery must be reported in 15 minute intervals. The sum of four consecutive intervals would represent the industry standard rate of Useful Heat Recovery in units of MBtu/hr. The heat transfer fluid specific heat and density must be reported at the time of commissioning and then reported again to the PA if there is a change. The meter needs to generate an accurate time date stamp.

6.11.3 **Minimum Fuel Metering Requirements**

All CHP systems and electric-only Fuel Cells 30 kW and larger and regardless of fuel type or renewable fuel blending percentage must be installed with a fuel metering system which allows the System Owner and Program Administrator to determine the amount of fuel consumption and allows the System Owner to support proper system operation and maintenance. In the case of onsite blended fuel projects, the metering system must allow the Program Administrator to determine the amount of renewable and non-renewable fuel consumption. The recorded data will be used to calculate the minimum system operating efficiency and GHG emissions of the system. These calculated values will be used to monitor compliance with the Program's GHG emission limits and minimum system operating efficiency requirements.

- **Meter Type**

All CHP systems and electric-only Fuel Cells that are 300 kW and smaller will be allowed to use an on-board fuel metering system to minimize cost. External fuel gas flow measurements are typically done in one of three ways:

1. Mass flow meter
2. Calculated based upon continuous differential pressure measurements across an orifice
3. Utility gas meter

On-board fuel metering systems, just as external fuel metering systems, must measure fuel consumption by the generator. The proposed meter type shall be identified in a Monitoring Plan developed for each

individual project. On-board meters must meet the same requirements as external meters which are outlined below.

- **Acceptable Fuel Metering Points**

For fuel metering that is external to the generator, an acceptable metering point is before fuel entry into the generator but downstream of any other loads (e.g., natural gas boiler, un-incentivized CHP system). For on-board metering systems, the fuel must be metered before any portion is consumed by the generator. For on-site blended fuel projects there must be separate meters for the renewable fuel and the non-renewable fuel. Proposed meter locations shall be identified in a Monitoring Plan developed for each individual project.

- **Meter Accuracy**

Flow measurement must include temperature and pressure compensation and must measure standard cubic feet (at 60 °F and 1 atmosphere) to within $\pm 5\%$ of maximum flow for the generator at design conditions. This requirement applies to on-board as well as external fuel metering systems.

- **Meter Measurement and Time Granularity of Acquired Data**

The PDP must log all required generator system fuel input data points no less frequently than once every hour. Calculated values must be reported in one hour intervals. Data must be recorded in units of standard cubic feet per minute. The Btu content and basis (HHV/LHV) of the fuel must be reported during commissioning either through data provided by the gas company or determined by analysis. Btu content of the fuel will need to be re-analyzed and reported to the PA when there is a reason to believe it has changed. The meter needs to generate an accurate time date stamp.

7 Metering & Data Collection

This section describes the requirements for data reporting, PDP application process, data security, and measurement and evaluation activities.

7.1 Data Reporting and Transfer Rules – Contract for PDP Services

It is the responsibility of the System Owners to contract with a Performance Data Provider (PDP) for a minimum of five years and ensure that performance data is provided to the Program Administrator or their designee monthly for five years. A list of qualified PDPs can be found on the Program Administrators websites.

The following are the PDP's primary responsibilities:

- Manage meter reading/data retrieval schedule
- Read and retrieve performance meter data
- Post data on appropriate Program Administrator server on a consistent and reliable schedule, per Program Administrator requirements.
- Validate performance data prior to providing to the PA using the approved validation rules outlined in this document
- Calculate annual production of generating system and net electrical energy discharged or offset for energy storage systems for incentive payment
- Format data using an approved SGIP format.
- Troubleshoot and resolve communications issues
- Store data in accordance with program requirements
- Make historical performance data available to Program Administrators as requested
- Provide technical support to Program Administrators as well as customer support
- Communicate meter/device changes to the Program Administrator
- Provide disaster recovery and data backup services as requested by respective Program Administrator
- Manage data on PDP server
- Ensure confidentiality of customer information and performance data
- Possess technical expertise and capability
- Comply with all State and Federal laws

The purpose of the following section is to outline the data reporting requirements (format, delivery method) and schedule for submitting data reports to the Program Administrators.

7.1.1 Data Format

Meter data must conform to the SGIP program requirements as set forth in *Section 5.5* and *Section 6.11* (15-minute electrical and thermal data as well as hourly fuel data, when applicable).

The PDP is responsible for submitting the incoming meter data to the Program Administrators on a monthly basis in the following two formats: Meter Interval Report and Application Interval Report. The Application Interval Report will be used for calculating the Annual Performance Based Incentive payments. The Meter Interval Report will be referenced as needed to support the data submitted for payment processing in the Application Interval Report. Both file types may be used for reporting and/or auditing purposes.⁶⁹

The data file format for submission will be “.csv”. The file formats are designed for bulk submission of data for any number of applications in a single calendar month. However, the file types (Meter Interval and Application Interval) must be submitted in separate files. If a Performance Data Provider is contracted to report data for more than one Program Administrator, they shall submit a separate file for each Program Administrator to maintain the confidentiality of the data.

7.1.2 Meter Reading and Data Submission Timeline

Meter data will be read remotely no less frequently than on a daily basis. In the event there is a communication problem between the PDP and the meter, and the 15 minute interval data is accumulated over a 24 hour period, it is acceptable to estimate the meter’s 15-minute interval data. For more information, refer to The PDP Specification. Accumulated data for a period longer than 24 hours will not be accepted. Other than this exception, the Program Administrator is not responsible for, and will not pay any customer incentives based on missing, estimated or invalid performance data.

Data for a SGIP project must be submitted in full calendar months. Once a month of data has been collected, the PDP has up until the 1st of the following month to validate, format, and submit the Meter and Application Interval data for that project. Annual PBI Incentive Payment amounts will only be processed after a full year of data has been submitted for the project.

For new SGIP projects, data recording for PBI Payment purposes should typically commence on the 1st of the month following the initial 50% Incentive Payment. Customers may choose to submit data since interconnection, if interconnection has occurred within the past 6 months. Any request for an alternate data collection commencement date will require Program Administrator approval.

⁶⁹ For a detailed description of the Meter and Application Interval Reports and submittal processes, please refer to The PDP Specification.

7.1.3 **Online Submission Process**

All performance data will be submitted via the SGIP online application database PDP Upload Portal. The portal will be accessed through www.selfgenca.com. Files that are submitted via e-mail will not be accepted.⁷⁰

7.1.4 **PDP Data Validation**

The PDP must validate all data prior to submitting it to the PAs. The following data validation rules shall apply:

- Time Check of Meter Reading Device/System (all)
- Meter Identification Check (all)
- Time Check of Meter (all)
- Pulse Overflow Check (if applicable to metering system)
- Test Mode Check (if applicable to metering system)
- Sum Check
- Spike Check
- kVARh Check

Descriptions of these validation rules are included in The PDP Specification.

7.1.5 **Data Audits & Payment Validation**

The Program Administrators may, at their discretion, perform validations on incentive payments prior to issuing payments to customers participating in this program. The validations will compare actual yearly incentive payments with expected payments based on design specifications and expected performance data submitted with the approved incentive reservation documentation. If payments fall outside expected ranges for the year, the incentive payment will be withheld until the Program Administrator determines to its satisfaction the reason for the discrepancy.

The PDP will work with the System Owner to resolve any discrepancies identified by the Program Administrator, which may include testing and/or recalibrating the meter/devices if deemed necessary. The Program Administrators are not responsible for the costs associated with investigating and resolving any such discrepancies (i.e., testing, meter replacement hardware, installation labor). However, if the Program Administrator requests an investigation that finds that the metering system is accurate, the Program Administrator will pay all reasonable and necessary costs for the investigation.

⁷⁰ Please refer to The PDP Specification for a detailed description of the data submittal process.

The Program Administrator may also perform random audits of PDP data to ensure accuracy and compliance with the requirements outlined in this document, or as part of the SGIP Measurement and Evaluation Program in accordance with the SGIP Handbook. Any PDP found to be in violation of any of these requirements will be subject to the penalties outlined later in this document. The Program Administrator, via the servicing local utility or its designated contractor may, at its discretion, inspect and test the performance meter or install separate metering in order to check meter accuracy, verify system performance, or confirm the veracity of monitoring and reporting services.

Any additional metering installed by or at the request of the Program Administrator will be paid for by the Program Administrator. However, in the event metering is installed during the course of an audit or investigation initiated by the Program Administrator where cheating or tampering is suspected and confirmed, the System Owner will be charged for these costs.

7.1.6 PDP Performance Exemptions

The PDP is responsible for meeting the above noted program requirements and for consistently posting performance data in accordance with the Program Administrator's scheduling and data posting requirements. At its discretion, the Program Administrator may grant reasonable allowances for occasional issues or technical problems, as well as for large catastrophic events such as earthquakes.

7.1.7 PDP Non-Performance

The Program Administrator will not issue incentive payments to customers based on estimated data from the PDP, nor will the Program Administrator estimate incentive payments under any circumstances. It is the PDP's responsibility to ensure timely and accurate posting of validated performance data so customer incentive payments can be made. Performance data also includes fuel consumption and useful thermal output data as this information will be used to verify compliance with program rules and impact PBI payments.

The following conditions may result in penalties, suspension of activity, or revocation of PDP approval from the Program Administrator:

- Data not posted by specified date
- Data not validated in accordance with program requirements
- Estimated data posted instead of actual data
- Meter change information not reported within 30 days of the meter change.
- If an audit or investigation shows a discrepancy of $\pm 5\%$ between the PDP reported data and Program Administrator check meter production data for one data report period. This discrepancy will trigger an audit schedule set by the Program Administrator for the PDP.

The PDP will be given reasonable opportunity to correct problems identified by the Program Administrator. The Program Administrator will work with the PDP to correct any such problems and avoid unnecessary delays in issuing incentive payments to customers, to the extent feasible.

Upon receipt of a non-performance notice from the PA, the PDP must, as soon as reasonably practicable:

1. perform a root-cause analysis to identify the cause of such a failure;
2. provide the PA with a report detailing the cause of, and procedure for correcting such failure within 3 days of completion of such root-cause analysis;
3. Implement such procedure after obtaining the respective PA approval of such procedure.

PDP Providers that fail to submit data to the Program Administrators when requested by the PA or an authorized agent of the CPUC may be removed as an eligible PDP from the Program Administrators' approved list. It is the Host Customer and/or System Owner's responsibility to ensure the transfer of production data from the Performance Data Providers (PDP) to the Program Administrators. The System Owner is responsible for resolving any issues relative to PBI and PDP performance data.

Should the PDP disagree with a PA decision regarding a penalty, the PDP has the right to appeal to the SGIP Working Group for further consideration.

7.1.8 Data Retention

Monthly performance data must be retained in accordance with program requirements. The PDP must be prepared to post historical interval data at the Program Administrator's request. The Program Administrator audit will include raw interval data, which is to be maintained by the PDP for comparison with validated interval data transmitted to the Program Administrator. The PDP is also responsible for providing backup and disaster recovery services for 100% of the data.

7.1.9 Technical and Customer Support

The PDP must provide a technical support number to the Program Administrator for use during normal business hours (8am to 5pm Pacific time, Monday through Friday, except holidays) to help resolve any data availability, format or corruption issues, communication problems, server access problems, or other technical issues. Within those normal business hours, the PDP must respond to Program Administrator requests within two business days with a status report and plan for correcting the issues. The PDP must also provide a customer support number to respond to customer inquiries within two business days from the initial customer contact. Program Administrators will have the discretion to set deadlines for the resolution of data transfer problems/issues.

7.1.10 Program Administrator Liability

Apart from the requirements identified herein, the PAs are not liable for the performance or non-performance of a PDP that may result in a delay of or incorrect amount of a PBI payment. The Program Handbook defines the criteria required for PDPs to participate in the Program only.

7.2 PDP Application Process

Any entity may choose to become a Performance Data Provider for the SGIP. Providers interested in becoming a PDP for the SGIP must submit information detailing their qualifications to become a PDP for the program. All PDPs must meet the requirements established herein in addition to the requirements set forth in the other metering sections of the SGIP Handbook. Interested parties may apply to qualify as a PDP for the SGIP program at any point in time.

To apply to qualify as a PDP, the Applicant completes the SGIP PDP Application and provides all documentation in the attached questionnaire⁷¹. Note that the PDP Applicant may submit one application for statewide PDP services to any of the Program Administrators. The Program Administrator will review the submitted documentation, determine if the PDP Applicant meets the program requirements and send the PDP Applicant a conditional approval letter if all requirements are met. Upon conditional PDP approval, the Applicant may contact the SGIP online application database provider to set up an account for the PDP Upload Portal.

7.2.1 Data Transfer Test

Once the prospective PDP has accumulated a month worth of data for the first SGIP project they must contact the SGIP online application database provider to schedule a data transfer test. The prospective PDP must create, format and validate Application Interval and Meter Interval Reports for all types of data services they are applying for (electrical, thermal and fuel, and/or energy storage) and submit the test files to the SGIP online application database via the PDP Upload Portal.

The Program Administrator will check the test files to ensure they comply with the SGIP guidelines. If the PDP Applicant fails the data transfer test and report approval, they will be given 2 weeks to resolve any technical or data format issues. Upon successful completion of the PDP data test procedures, the PDP will receive a final approval notice and will be qualified to provide PBI data to the Program Administrator for incentive payment.

7.3 Data Privacy and Security

Protecting the privacy of System Owners and Host Customer is of the highest order. As such, data shall be collected, processed, and reported by the PDP to the System Owner and the Program Administrator in accordance with this section. The PDP is responsible to ensure timely, consistent and accurate reporting of performance data. Data must be located in a secure facility, on a secure server and have firewall and equivalent protection. The PDP must protect the confidentiality of the customer information and performance data in accordance with all program guidelines. The PDP must also follow all applicable state and federal privacy and data security laws.

⁷¹ Please refer to The PDP Specification and the Program Administrators' websites for the PDP Application and detailed application instructions.

The PDP may provide data to third parties, including Contractors and Host Customers (if different than the System Owners), provided the System Owner has consented in writing to the release of such performance data. Electricity, thermal and fuel meters shall be kept secure from Denial of Service (DOS) Attacks, Port Scanning, Unauthorized Access and other security violations. To achieve this security, Communications Interfaces to all meters must be located in a physically secure location and include strong password protection with either a network firewall or encrypted connection to limit the meter's network access to the PDP and/or a defined list of authorized users. In addition, security measures may be implemented as needed to ensure data security including restriction of direct meter access for real time data to sequential access basis.

7.4 Measurement & Evaluation (M&E) Activities

As a condition of receiving incentive payments under the SGIP, System Owners and Host Customers agree to provide full access to Site and system equipment and participate in Measurement and Evaluation (M&E) activities as required by the CPUC for five-years. M&E activities will be performed by the Program Administrator (PA) or the PA's independent third-party consultant and include, but are not limited to, periodic telephone interviews, Site visits, development of a M&E Monitoring Plan, review of monitoring plans developed by the project Developer or host Site, installation of metering equipment or review/inspection of metering equipment installed by the project Developer or host Site, collection and transfer of data from installed system monitoring equipment, whether installed by Host Customer, System Owner, a third party, or the PA. This data will be used to show the performance of technologies by class (e.g. wind turbines), and may determine the performance of those technology classes as they see fit. Performance data from specific projects, however, will remain confidential.

7.4.1 M&E Field Visits

During the course of the Project, the PA or the PA's independent third-party consultant may require one or more visits to the Site for M&E purposes. These site visits can occur before, during or after startup of the system for the purposes of developing a monitoring plan, installing additional M&E instrumentation, performing equipment operations inspection and retrieving system data. These visits are separate and distinct from the Post-Installation Inspection visits by the PA or its consultants (*see Section 2.5.3*), which are used to determine eligibility of the installed system and occur during the Incentive Claim stage of the application process.

7.4.2 M&E Metering Requirements

All SGIP systems require installation of metering devices to measure and record electrical output or offset, waste heat, and fuel consumption for M&E purposes. For installations 30kW and larger, the PAs may collect this information from the data submitted by the Performance Data Providers (PDP) for PBI payment purposes. For projects under 30kW, the PA or the PA's independent third-party consultant may install meters to collect M&E data at the Program's expense.

The Host Customer and System Owner agree to provide system monitoring data (15-minute interval data for electrical and thermal and hourly for fuel consumption) to the SGIP M&E consultant on a monthly basis for the duration of five years.

7.4.3 *Disposition of SGIP Metering Equipment*

Upon completion of the SGIP M&E metering activities at the Site, the Program Administrator will offer all M&E metering equipment installed by the Program to the System Owner for transference. The Program Administrator will provide an Equipment Transfer Agreement with a schedule of the SGIP M&E equipment located at the Site. The Equipment Transfer Agreement must be signed by both the System Owner and the Program Administrator. If the System Owner does not wish to accept the M&E metering equipment, the Program Administrator or its independent third-party consultant will remove the M&E metering equipment. The Program Administrator shall pay the costs for meter removal. Dispute Resolution and Infractions

8 Dispute Resolution

All participants shall attempt in good faith to resolve any dispute arising out of, or relating to, this transaction promptly by negotiations between the Program Administrator or his or her designated representative and the Host Customer, System Owner and/or Applicant or their designees. Either party must give the other party, or parties, written notice of any dispute. Within thirty (30) calendar days after delivery of the notice, the parties shall meet, and attempt to resolve the dispute. If the matter has not been resolved within thirty (30) calendar days of the first meeting, any party may pursue other remedies including mediation. All negotiations and any mediation conducted pursuant to this clause are confidential and shall be treated as compromise and settlement negotiations, to which Section 1152.5 of the California Evidence Code shall apply. Notwithstanding the foregoing provisions, a party may seek a preliminary injunction or other provisional judicial remedy if in its judgment such action is necessary to avoid irreparable damage or to preserve the status quo. Each party is required to continue to perform its obligations under this Contract pending final resolution of any dispute arising out of, or relating to, this Contract.

9 Participant Performance and Infractions

9.1 Participant Performance

All participants⁷² are expected to follow program rules and eligibility requirements. Failure to do so will result in warnings and/or infractions. Please see *Section 9.2* for additional information regarding warnings and infractions. Program Administrators will exercise their judgment in issuing warnings and assessing infractions. In an effort to ensure participant performance, all participants will be required to maintain a high level of performance in each of the following categories:

- Application
- Inspection
- Attrition and Extensions
- Data Reporting
- SGIP Online Application Database Operation
- Developer

9.1.1 ***Application***

Applications must be submitted with complete and accurate documentation and must meet all deadlines. Applications with incomplete, falsified, or inaccurate documentation⁷³ or that do not meet required due dates may receive warnings and/or result in an infraction.

9.1.2 ***Inspection***

All projects may be inspected at any time during project's permanency period and are expected to meet document and operational requirements of the program. Failure to do so will count as a failed inspection. Participants with a high statewide inspection failure rate may forfeit future participation and/or all active applications/incentive.

9.1.3 ***Attrition and Extensions***

Participants are expected to submit committed projects. Cancelled withdrawn applications will be counted towards attrition rate. Participants with a high attrition rate may forfeit future participation and/or all active applications/incentives.

Participants are also expected to meet project milestone due dates as originally assigned. Excessive extension requests among a participant's applications may receive warnings and/or result in an infraction.

⁷² For the purpose of this section, participant is defined by an entity or group of entities submitting applications, data, or developing and/or installing SGIP projects.

⁷³ Including criteria that would grant higher priority in the event of a lottery.

9.1.4 **Data Reporting**

Participants are required to submit all necessary operational and performance data. Participants submitting data past their designated due date may receive warnings. Participants that do not submit data at all for their projects may be subject to an infraction. Any falsified or blank submissions will result in an automatic infraction.

9.1.5 **SGIP Online Application Database Operation**

Participants are required to comply with the Terms of Use of the SGIP database for all accounts, applications, and PBI data submissions. Non-compliance with the Terms of Use or attempting to circumvent the SGIP database application policies or procedures will result in an automatic infraction.

9.1.6 **Developer**

An infraction may be issued if the Developer of a project does not fully and/or accurately disclose Developer and ownership information as listed in *Section 4.1.5*.

9.2 **Infractions**

Infractions are any actions that circumvent program policy or requirements, or have the intent to do so, in addition to low performance levels. Infractions can be issued to any participant, as defined in *Section 4.1*. The Program Administrators or Energy Division will evaluate program infractions, which may include gross negligence or intentional submission of inaccurate project information. Program infractions may be determined at any stage of the SGIP process and are applicable statewide. If it is determined that a program infraction has been committed, a reasonable sanction shall be imposed. The following sanctions may be applied:

- Suspension or expulsion from future program participation
- Cancellation of existing projects
- Application fee forfeiture
- Fiscal or programmatic audit

9.2.1 **Issuance of Warnings and Infractions**

If a Program Administrator determines that an infraction may be warranted, a notice will be sent to the violating participant. Participants may be issued one or more warnings before being issued an infraction; however, serious violations may result in an immediate infraction. Participants may receive no more than three warnings before an infraction is issued. Infractions will be reviewed by all SGIP Program Administrators and will be communicated to the participant. Notwithstanding the above, Energy Division may initiate an investigation of potential infractions, which may result in a penalty for any infraction determined to have occurred.

Definitions and Glossary

Amp-hour Capacity or Nominal Capacity (Ah for a specific C-rate): The total Amp-hours available when the battery is discharged at a continuous current over a specified period of time (specified as a C-rate) from 100 percent state-of-charge to a specified cut-off voltage.

Applicant: The entity, either the Host Customer, System Owner, or third party designated by the Host Customer responsible for the development and submission of the SGIP application materials. Functions as the main point of communication between the SGIP Program Administrator for a specific SGIP Application.

Application Interval Report: Monthly meter data report provided by the Performance Data Provider (PDP). The Application Interval Report format will be the same for all PDPs and all Applications as specified by the Program Administrators. The data in this file will be validated upon upload and used for the calculation of Annual PBI payments. An Entry in this file shall represent the combined data readings of all meters associated with a particular SGIP Application Code.

Backup Generators: Operate as short-term temporary replacement for electrical power during periods of Electric Utility power outages. In addition to emergency operation they ordinarily only operate for testing and maintenance. Backup generators do not produce power to be sold or otherwise supplied to the grid or provide power to loads that are simultaneously serviced by the Electric Utility grid. Backup generators only service customer loads that are isolated from the grid either by design or by manual or automatic transfer switch.

Blended Fuel: A blended fuel is a combination of any renewable fuel with a non-renewable fuel and where the amount of renewable fuel is less than 100%. Projects using less than 100% of an eligible renewable fuel will be identified as a blended project equivalent to their renewable fuel percentage.

California Manufacturer: A California Manufacturer operates a manufacturing facility in California, is licensed to conduct business in California and is registered with a primary or secondary manufacturing NAICS code. Equipment is deemed to be manufactured in California if at least 50% of the value of the capital equipment has been made in a dedicated production line by an approved California Manufacturer.

CSE: Center for Sustainable Energy®

CEC: California Energy Commission

CPUC: California Public Utilities Commission

Developer: For applications received in Steps 1 and 2, a Developer is the corporate entity that holds the contract for purchase and installation of the system, and/or alternative System Ownership Agreement (such as a Power Purchase Agreement) with the host customer and handles the project's development activities. For applications received in Step 3 and later, a Developer is, if not individual homeowners applying for SGIP incentives for systems located on their own property, the corporate entity registered and in good

standing with the Secretary of State of California that handles a substantial amount of the project's development activities.

Directed: A directed renewable fuel is produced and captured at a different location than the project site of the electrical generation facility. The renewable fuel is delivered to the facility through a common carrier pipeline, which must be demonstrated through a procurement contract. A directed renewable fuel must be injected into a common carrier pipeline system that is either within the Western Electricity Coordinating Council (WECC) region or interconnected to a common carrier pipeline system located within the WECC region.

Disadvantaged Community: Any census tract that ranks in the statewide top 25% most affected census tracts in the most recently released version of the environmental health screening tool, CalEnviroScreen, plus those census tracts that score within the highest 5% of CalEnviroScreen's pollution burden, but do not receive an overall CalEnviroScreen score.

Education Institution: Any institution that would otherwise be eligible for funding through the California Clean Energy Jobs Act (Proposition 39), or a college or university accredited to operate in California.

Electric Utility: The Host Customer's local electric transmission and distribution service provider for their site.

Energy Capacity or Nominal Energy for DC/AC systems (Wh (for a specific C-rate)): The total watt-hours available when a storage system is discharged at a continuous current over a specified period of time (specified as a C-rate) from 100 percent state-of-charge to the cut-off voltage.

Energy Storage: Technologies able to store energy that can be discharged as useful energy at another time in order to directly supply electricity or offset electricity consumption. Unless specified otherwise, "energy storage" in the SGIP Handbook applies to all eligible storage technologies, including mechanical, electrochemical, or thermal energy storage.

Energy Storage Paired with and Charging from an On-site Renewable Generator: Energy storage system that is paired with an on-site generator and charges at a minimum 75% from the generator.

ESCO: Energy Service Company (ESCO), a business entity that designs, builds, develops, owns, operates or any combination thereof self-generation Projects for the sake of providing energy or energy services to a Host Customer.

Fuel Cell: Power plants that produce electricity through an electrochemical reaction with a fuel source.

Gas Service: The gas line from the Utility's distribution main to the serving gas meter

HVAC-integrated S-TES: Small thermal energy storage systems integrated to offset peak energy consumption of direct expansion refrigerant based air conditioning units less than or equal to 20 tons.

Host Customer: An entity that meets all of the following criteria: 1) has legal rights to occupy the site, 2) receives retail level electric or gas distribution service from PG&E, SCE, SoCal Gas or SDG&E, 3) is the utility customer of record at the site 4) is connected to the electric grid, and 5) is the recipient of the net electricity generated from the self-generation equipment.

Inspection: An inspection can be conducted as an on-site Post-Installation Inspection by the PAs or their third-party consultant or as a virtual post-installation inspection executed by the Developer, System Owner or Host Customer. For a description of the post-installation inspection protocol, please refer to the Energy Storage Post-Installation Inspection and Discharge Testing Protocol and SGIP Inspection Sampling Protocol at www.selfgenca.com. In addition, general inspections can be conducted at any point during the permanency period.

Investor Owned Utility: For purposes of the SGIP, this refers to Pacific Gas & Electric Company, San Diego Gas & Electric Company, Southern California Edison Company and Southern California Gas Company.

ISO: International Standards Organization

ITC: Investment Tax Credit

Local Governmental Agency: Any entity described by Public Contracts Code section 22161 (f).

Low-Income Community: Census tracts with median household incomes at or below 80% of the statewide median income or with median household incomes at or below the threshold designated as low-income by the Department of Housing and Community Development's list of state income limits adopted pursuant to Section 50093.

Low-Income Residential Customer: An individual customer living in a low-income residence, as described in subparagraph (C) of paragraph (3) of subdivision (a) of section 2852 of the Public Utilities Code.

Low-Income Residential Housing: Multifamily residential building of at least five rental housing units that is operated to provide deed-restricted low-income residential housing, as described in clause (i) of subparagraph (A) of paragraph (3) of subdivision (a) of section 2852 of the Public Utilities Code, and is either: 1) in a disadvantaged community; or 2) a building where at least 80% of the households have incomes at or below 60% of the area median income, as defined in subdivision (f) of section 50052.5 of the Health and Safety Code.

Meter Interval Report: Monthly meter data report provided by the Performance Data Provider (PDP). The Meter Interval Report format will vary by PDP. The PDPs shall format their report so that it includes all meter and sensor data recorded over the measured interval at a minimum 15-minute frequency, with the exception of Fuel Consumption, which shall be measured and reported hourly. This report should be formatted as specified by SGIP program requirements.

Non-Profit Organization: An organization registered and in good standing with the California Secretary of State as a domestic non-profit entity.

Non-Renewable Fuel: A non-renewable fuel includes fossil fuels and synthetic fuels. Synthetic fuels are fuels derived from materials that are not renewable or fossil fuels. SGIP eligible fossil fuels are gasoline, natural gas and propane. SGIP eligible synthetic fuels include, but are not limited to, the direct use or synthesis of fuels sewage sludge, industrial waste, medical waste or hazardous waste.

On-Site: An on-site renewable fuel is produced and captured at the same location as the site of the electrical generation facility. Additionally, the renewable fuel is delivered from the source to the generating system via a dedicated pipeline. A dedicated pipeline is defined as only physically capable of delivering gas to the generating facility.

Paired: Two or more technologies located on the same electrical circuit and behind the same utility electrical meter.

Parallel Operation: The simultaneous operation of a self-generator with power delivered to or received by the Electrical Utility while interconnected to the grid. Parallel Operation includes only those generators that are interconnected with the Electric Utility distribution system for more than 60 cycles.

PDP: Performance Data Provider. A company that contracts with the SGIP Participant to read and communicate their metering data to the Program Administrators.

PG&E: Pacific Gas and Electric Company

Power Purchase Agreements: An agreement for the sale of electricity from one party to another, where the electricity is generated and consumed on the Host Customer site. Agreements that entail the export and sale of electricity from the Host Customer site do not constitute Host Customer's use of the generated electricity and therefore are ineligible for the SGIP.

Pressure Reduction Turbine: If a facility with a high pressure fluid (e.g., steam, water, natural gas, etc.) distribution network and pressure reduction valve(s), installs a turbine to replace or operate in parallel with these pressure reduction valve(s), then the application is considered a Pressure Reduction Turbine.

Program Year: January 1 through December 31.

Project: For purposes of the SGIP, the "Project" is the installation and operation of the proposed eligible self-generation technology(ies) at a specific site, as described by the submitted Reservation Request documentation.

Public Entity: Includes the United States, the state and any county, city, public corporation, or public district of the state, and any department, entity, agency, or authority of any thereof.⁷⁴

⁷⁴ Source: CALIFORNIA CODES - PUBLIC CONTRACT CODE, SECTION 21611

Refrigeration TES: Thermal energy storage systems integrated to offset peak energy consumption of direct expansion refrigerant-based refrigeration systems.

Renewable Fuel: A renewable fuel is a non-fossil fuel categorized as one of the following: biodiesel or gas derived from digester gas, landfill gas or biomass. SGIP projects can use one or more eligible renewable energy sources, as identified by the Renewable Portfolio Standard (RPS).

Reservation Expiration Date: The Reservation Expiration Date is the date the Incentive Reservation expires and all required documentation must be provided by.

Round Trip Efficiency: Ratio of the energy delivered during discharge of the energy storage system to the energy required to charge the energy storage system.

SCE: Southern California Edison

SDG&E: San Diego Gas and Electric

Single Business Enterprise: For purposes of defining a site, a Single Business Enterprise is a business that has a unique taxpayer or employer identification number. Two or more businesses with the same taxpayer or employer identification number, as a group, are a Single Business Enterprise.

Site: A Single Business Enterprise or home located on an integral parcel or parcels of land undivided by a public road or thoroughfare regardless of the number of meters serving that site; or if divided by a public road or thoroughfare, served by a single Electric Utility meter. Separate business enterprises or homes on a single parcel of land undivided by a highway, public road, thoroughfare or railroad would be considered for purposes of the SGIP as separate sites.

Small Business: A business or manufacturer, including affiliates, with average annual gross receipts of \$15 million or less, over the last three tax years.

SoCalGas: Southern California Gas Company

Stand-alone Energy Storage: An energy storage system located on a Host Customer project site that does not also host a generating technology.

State Governmental Agency: Any entity described by Government Code section 11000.

Steam Turbine CHP: If a facility with a steam distribution network installs a steam turbine that is placed between the boiler and the steam distribution network, and steam pressure is increased, then the application is considered a Steam Turbine CHP. Pressure can be increased either through the purchase of new boilers or by increasing the pressure on existing boilers. In either case, boiler fuel usage per unit of steam production increases with boiler pressure.

System Owner: The owner of the SGIP system at the time the incentive is paid. For example, in the case when a vendor sells a turnkey system to a Host Customer, the Host Customer is the System Owner. In the case of a leased system, the lessor is the System Owner.

TES: Thermal Energy Storage

Thermal Energy Storage: Technologies able to store energy and discharge it at a later time as thermal energy to offset electricity consumption.

Thermal Load: Host Customer heating process(es) including but not limited to industrial process heating, space heating, domestic hot water heating and/or heat input to an absorption chiller used for space cooling or refrigeration.

Thermal Load Equipment: Thermal end-use equipment such as but not limited to absorption chillers (indirect or direct fired), boilers, water heaters, space heaters, furnaces, dryers, secondary heat exchangers, thermal storage tanks or vessels including pumps, cooling towers, and piping or any other ancillary equipment.

Waste Gas: Waste Gas fuels used for conventional CHP technologies and Fuel Cells are strictly defined as natural gas that is generated as a byproduct of petroleum production operations and is not eligible for delivery to the utility pipeline system.

Waste Heat to Power: If a facility discarding heat as a result of commercial or industrial processes installs a turbine driven by the discarded heat, then the application is considered a Waste Heat to Power system. These systems typically involve a heat recovery system, which transfers the waste heat to a working fluid which drives the turbine.

Legislation and Regulatory Background

Date	Bill Number	Description
9/6/2000	AB 970	Assembly Bill required the CPUC to initiate load control and distributed generation activities.
3/27/2001	D 01-03- 073	CPUC Decision complying with Assembly Bill 970 and establishing the Self Generation Incentive Program. Implementation of PU Code Section 399.15(b), Paragraph 4-7; Load Control and Distributed Generation Initiatives.
06/01/2001	D. 01-06-035	CPUC Decision establishing waste heat recovery standards for SGIP. Requires Energy Branch to develop reliability criteria.
01/18/2002	Letter on Reliability Criteria	CPUC Energy Branch Letter establishing reliability criteria requirements for level 3 technology applications received after January 1, 2002
02/07/2002	D. 02-02-26	CPUC Decision addressing eligibility of customers served by electric municipalities, maximum size and annual program budget.
04/04/2002	D. 02-04-004	CPUC Decision clarifying Applicant's ability to receive incentive funding from multiple sources. Addressing SCAQMD's PTM of Decision 01-03-073
09/19/2002	D. 02-09-051	CPUC Decision adding technology level 3-R, which establishes a new level of incentives. Contains specific requirements for projects using renewable fuels for level 3-R. Addressing Capstone's PTM
10/12/2003	AB 1685	<ul style="list-style-type: none"> • Extended the SGIP through 2007 • Required that projects commencing January 1, 2005 meet a NOx emission standard • Required that projects commencing January 1, 2007 meet a more stringent NOx emission standard and a minimum system efficiency standard. • Established a NOx emission credit that can be used by combined heat and power (CHP) units to meet minimum system efficiency standard
9/22/2004	AB 1684	Exempts certain projects from NOx emission standards set forth in AB 1685 that meet waste gas fuel and permitting requirements.

Date	Bill Number	Description
12/16/2004	Decision 04-12-045	Modified SGIP to incorporate provisions of AB 1685: <ul style="list-style-type: none"> • Eliminates maximum percentage payment limits • Reduces incentive payments for several technologies • Expands opportunities for public input regarding developing a declining incentive schedule, developing an exit strategy and adopting a data release format • Required an application fee for all projects received after 1/1/2005 in order to deter against “phantom projects”. This requirement was removed beginning in 2007 except in the case of new technologies that are in the process of certification.
1/12/2006	Decision 06-01-047	Established the California Solar Initiative (CSI) and ordered changes in the 2006 SGIP to accommodate the transition of solar program elements to the CSI beginning January 1, 2007.
9/29/2006	AB 2778	<ul style="list-style-type: none"> • Extended SGIP until January 1, 2012 • Limited eligible technologies beginning January 1, 2008 to fuel cells and wind systems that meet emissions standards required under the distributed generation certification program adopted by the State Air Resources Board • Requires that eligibility of non-renewable fuel cell projects be determined either by calculating electrical and process heat efficiency according to PU Code 216.6 or by calculating overall electrical efficiency
4/24/2008	Decision 08-04-049	Removed the 1 MW cap on incentives for 2008 and 2009 allowing projects to receive lower incentives on a tiered structure for the portion of a system over 1 MW.
9/28/2008	AB 2267	Requires an additional 20% incentive for the installation of eligible distributed generation resources from a California Supplier. This additional incentive is applied only to the technology portion of the incentive; the additional incentive for renewable fuels is not included in calculating the 20%.
11/21/2008	Decision 08-11-044	<ul style="list-style-type: none"> • Determined that Advanced Energy Storage systems coupled with eligible SGIP technologies will receive an incentive of \$2/watt of installed capacity. • Revises the process for the review of SGIP program modification requests
9/09/2009	Decision 09-09-048	Grants a petition to modify SGIP policies expanding eligibility for Level 2 incentives to include “directed biogas” projects where renewable fuel is nominated via contract.

Date	Bill Number	Description
2/25/2010	Decision 10-02-017	<ul style="list-style-type: none"> • Revises Decision 08-11-044 so that Advanced Energy Storage systems coupled with fuel cells must meet the site specific requirements for on-site peak demand reduction and be capable of discharging fully at least once per day in order to be eligible for the \$2/watt incentive from the self-generation incentive program. • Determines that Advanced Energy Storage systems coupled with eligible technologies under the SGIP must install metering equipment capable of measuring and recording interval data on generation output and Advanced Energy Storage system charging and discharging.

09/08/2011	CPUC D.11-09-015	<ul style="list-style-type: none"> • Adds eligibility requirements based upon greenhouse gas reductions. • Establishes an on-site emission rate that projects must beat to be eligible for SGIP participation of 379 kg CO₂/MWh. • Adds Waste Heat to Power, Pressure Reduction Turbine, Internal Combustion Engine – CHP, Microturbine – CHP, Gas Turbine – CHP, Stand-Alone AES technologies to the list of eligible technologies. • Revises the incentive rates for all technologies and adds a \$2.00/Watt biogas adder. • Directs that Directed Biogas can only be procured from in-state suppliers. • Eliminates maximum size restrictions given a project meets on-site load. Sets a 30 kW minimum for wind and renewable fueled fuel cell projects. • Adopts a hybrid payment structure with 50% upfront, 50% PBI based on kWh generation of on-site load for projects 30 kW and larger. Projects under 30 kW will receive the entire incentive upfront. • Adopts the following assumed capacity factors to be used in PBI calculations: 10% for AES, 25% for wind, and 80% for all other distributed energy resources. • Implements incentive decline in the following manner 10% per year for emerging technologies and 5% per year for all other technologies, beginning 1/1/2013. • Adopts a supplier concentration limit where no more than 40% of the annual statewide budget available on the first of a given year may be allocated to any single manufacturer's technology during that year. • Establishes a maximum project incentive of \$5 million. • Establishes that the minimum customer investment in a project must be 40% of eligible project costs. • Establishes an SGIP incentive budget allocation of 75% for renewable and emerging technologies, and 25% for non-renewable technologies. • Determines that the Program Administration Budget will be reduced to 7%. • Establishes that projects exporting to the grid are eligible for SGIP incentives as long as they do not export more than 25% on an annual net basis. • Makes an energy efficiency audit mandatory for participation in SGIP unless an extensive audit has been conducted within five years of the date of the reservation request. • Establishes an application fee that is 1% of the amount of incentive requested
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Date	Bill Number	Description
		<ul style="list-style-type: none"> Limits all projects to one six month extension. Request for a second extension may be made to the Working Group. Extends the warranty period to 10 years
	<u>ADVICE LETTER</u> <u>4410-G</u>	ADVICE LETTER COMPLYING WITH RESOLUTION E-4519 Proposed Amendments to the Self-Generation Incentive Program Handbook to Conform to Resolution E-4519. Changes to the RTE for AES technologies and elimination of certain data formatting requirements for PDP providers
	<u>ADVICE LETTER</u> <u>No. 3253-G/3940 –E</u>	Proposed Revisions to the Self-Generation Incentive Program Handbook to Implement Decision (D.) 11-09-015: Implementation of the Hybrid-Performance-Based Incentive Payment Structure; Metering and Monitoring Protocols; Other Amendments.
	ADVICE LETTER No 3253-G-A/3940–E-A	Supplemental Filing: Proposed Revisions to the Self-Generation Incentive Program Handbook to Implement Decision (D.) 11-09-015: Implementation of the Hybrid-Performance-Based Incentive Payment Structure; Metering and Monitoring Protocols; Other Amendments
5/24/2012	Decision 12-05-037	<ul style="list-style-type: none"> Orders that all technologies previously eligible for the Emerging Renewables Program should be immediately eligible for the SGIP Determines that consolidating the ERP and SGIP programs now is preferable to perpetuating two competing programs that serve the same types of technologies and policy purposes

Date	Bill Number	Description
5/20/2014	SB 861	<ul style="list-style-type: none"> • Extended SGIP funding through 2019 and extended SGIP administration until January 1, 2021 • Directed the Commission to update the factor for avoided greenhouse gas emissions based on the most recent data available to the State Air Resources Board • Established eligibility requirements for distributed technologies that: reduce demand from the grid by offsetting some or all of the customer's onsite load, are commercially available, safely utilize the existing T&D system, and improve air quality by reducing criteria air pollutants • Specified that SGIP incentive recipients are subject to data collection and site inspections upon request • Directed the Commission to develop a capacity factor for each technology in the SGIP • Directed the Commission to consider the cost of greenhouse gas emissions reductions, peak demand reductions, system reliability benefits, and other measurable factors when allocating program funds between eligible technologies • Change the California supplier requirement to "manufactured in California" • Specified that the SGIP will be evaluated on the following performance measures: reductions of GHGs, reductions of air pollutants, amount of energy reductions measured in energy value, reductions of customer peak demand, capacity factor, value to T&D system measured in avoided cost of upgrades and replacement, ability to improve onsite electricity reliability
09/27/2014	AB 1478	<ul style="list-style-type: none"> • Clarified that eligible technologies can shift onsite energy use to off-peak times
12/18/2014	Decision 14-12-033	<ul style="list-style-type: none"> • Decision authorizing Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, and Southern California Gas Company to continue to collect funds for the Self-Generation Incentive Program pursuant to Public Utilities Code Section 379.6 as amended by Senate Bill 861
	ADVICE LETTER 47-A	<ul style="list-style-type: none"> • Advice Letter to propose modifications to the SGIP Handbook to include revised capacity rating methodologies for Pressure Reduction Turbine (PRT) and Waste Heat to Power (WHP) technologies • Included conventional topping cycle Steam Turbines in the program.

Date	Bill Number	Description
6/11/2015	Resolution E-4717	<ul style="list-style-type: none"> Approval of Advice Letter No. PGE 3552-G/4563-E, CSE 55, SCE 3165-E, SCG 4741, filed January 20, 2015, to incorporate Residential AES Operational Requirements Affidavit into the SGIP Handbook.
6/11/2015	D.15-06-002	<ul style="list-style-type: none"> Approval of Program Administrator's Petition for Modification to allow a maximum of three six-month extensions, filed November 13, 2014.
7/1/2015	Advice Letter No. CSE 60, PG&E 4663-E, SCE 3242-E, SCG 4828.	<ul style="list-style-type: none"> Compliance Advice Letter to incorporate third six-month extension into the SGIP Handbook.
7/17/2015	Disposition Letter for Advice Letter CSE 56	<ul style="list-style-type: none"> Approval of CSE Advice Letter 56, filed on February 17, 2015, to incorporate kW, kWh offset methodologies, and other associated changes for HVAC-Integrated Small TES systems.
11/19/2015	D.15-11-027	<ul style="list-style-type: none"> Decision Revising the GHG Emissions Factor to Determine Eligibility to Participate in the SGIP. GHG Emissions Factor revised to 350 kg CO₂/MWh averaged over 10 years for non-renewable generation technologies. For technologies that are subject to a 1% annual degradation rate, the first-year GHG Emissions Factor for Electric-Only Fuel Cells set at 334 kg CO₂/MWh., assuming a 1% annual degradation rate. Storage devices should demonstrate an average round trip efficiency of at least 66.5% over ten years to qualify for SGIP, which is equivalent to a first-year round trip efficiency of 69.6%.
12/16/2015	Advice Letter No. CSE 66, PG&E 4759-E, SCE 3327-E, SCG 4904	<ul style="list-style-type: none"> Advice Letter to incorporate kW, kWh offset methodology and other associated changes for refrigeration TES. Advice Letter became effective January 15, 2016.
12/17/2016	D.15-12-027	<ul style="list-style-type: none"> Decision Partially Suspending Disbursement of 2016 Program Year Funds and Acceptance of New Applications for the Self-Generation Incentive Program. Half of 2016's program year funds are available to fund new applications at the beginning of the year. The PAs shall not disburse any additional funds authorized for program year 2016 until further ordered by the Commission.
12/21/2015	Advice Letter No. PG&E 3663-G/4763-E, CSE 67, SCE 3331-E, SCG 4907	<ul style="list-style-type: none"> Compliance Advice Letter incorporating the GHG Emissions Factor from D.15-11-027 into the SGIP Handbook. Advice Letter became effective January 1, 2016.
6/23/2016	D. 16-06-055	<ul style="list-style-type: none"> Decision Revising the SGIP Pursuant to SB 861, AB 1478, and Implementing Other Changes

Date	Bill Number	Description
		<ul style="list-style-type: none"> • Divided SGIP budget 75% storage, 25% generation • Created renewable and small residential storage carve-outs. • Revised incentive rates for all SGIP technologies. • Made several substantial changes to the SGIP. • Resolved several petitions for modifications regarding Distributed Wind Energy Association, pressure reduction turbines and biogas incentive, PowerTree's request to extent deadlines, and Maas Energy's request to investigate the February 23, 2016 program opening.
4/6/2017	D.17-04-017	<ul style="list-style-type: none"> • Decision revising the SGIP pursuant to AB 1637 and CALSEIA's Petition for Modification • Authorized doubling authorized SGIP collections for years 2017-2019
10/12/2017	D.17-10-004	<ul style="list-style-type: none"> • Decision establishing Equity Budget for Self-Generation Incentive Program • Beginning in Step 3, 25% of the funds collected for energy storage projects shall be reserved for the SGIP Equity Budget, which will be awarded only to projects that meet specific criteria.
2/6/2020	D.20-02-002	<ul style="list-style-type: none"> • Decision to modify D.11-09-015 and D.16-06-055 to eliminate the application fee for all SGIP residential projects. • Decision modifies D.11-09-015 and D.16-06-055 to eliminate the requirement that SGIP participants submit a paper copy of the energy efficiency audit or its summary as part of the SGIP application process. Instead, SGIP PAs shall require the project host customer to attest as part of the Reservation Request Form that they performed an energy efficiency audit at the project site address and received and reviewed the findings of the audit.

Appendix A - System Calculation Example

Efficiency Calculations

Example #1: Efficiency Calculations for 255 kW IC Engine CHP System

Three 85 kW internal combustion engines operating on natural gas are proposed to provide electricity and heat to a hospital. The internal combustion engines are sized such that they will operate at close to full load most of the year. Their output will be reduced in July and August so that the recovered waste heat does not exceed the thermal load. The hospital's Thermal Load consists primarily of domestic hot water and space heating. The Minimum Operating Efficiency Worksheet used for this application is similar to the residential version, but the Thermal Load and Electrical Load per Month must be calculated and justified separately and entered manually for each month. The internal combustion engines exceed the PU Code 216.6. (a) and (b) requirements, therefore they meet the minimum operating efficiency requirement for the program. They also pass the NOx emissions eligibility with CHP credits and pass the GHG emissions eligibility. Their thermal coincidence factor is less than 1.0 for every month of the year indicating that they are utilizing waste heat recovery effectively and since they are qualified for the feed-in-tariff the export factor indicates that they are exporting less than the program export limit which is 25% more than the site electrical load.

Appendix B – Combustion Emission Credit Calculation

Micro-turbine, internal combustion engine, gas Turbine and steam turbine CHP Projects that do not meet the applicable NO_x emission standard (.07 lb/MWh) may receive emission credits for waste heat utilization. Credit shall be at the rate of one MWh for each 3.4 million British thermal units (Btu) of heat recovered.

The following formula is used to modify the emissions rating for a generating system by giving credit for waste heat utilization:⁷⁵

$$\text{Lb/MWh}_{\text{w/credit}} = \text{Lb/hr}_{\text{EmissionRate}} / (\text{MW}_{\text{Rated}} + \text{MW}_{\text{ProcessHeat}}) \equiv \text{System emissions with thermal credit}$$

Where:

$$\text{Lb/hr}_{\text{EmissionRate}} = \text{Lb/MWh}_{\text{w/o_credit}} \times \text{MW}_{\text{Rated}} \equiv \text{NO}_x \text{ emission rate at the system's rated capacity}$$

$$\text{Lb/MWh}_{\text{w/o_credit}} \equiv \text{System's verified emissions without thermal credits}$$

$$\text{MW}_{\text{Rated}} \equiv \text{System's Rated Capacity as defined in Section 6.1.5.}$$

$$\text{MW}_{\text{ProcessHeat}} = (\text{MMBtu/yr}_{\text{UtilizedWasteHeat}} / 3.4 \text{ MMBtu/MWh}) / \text{EFLH/yr} \equiv \text{Capacity credit for useful thermal energy}$$

$$\text{MMBtu/yr}_{\text{UtilizedWasteHeat}} \equiv \text{Annual utilized waste heat}$$

$$3.4 \text{ MMBtu/MWh} \equiv \text{Heat recovered conversion factor}$$

$$\text{EFLH/yr} \equiv \text{System's annual equivalent full load hours of operation}$$

All assumptions, backup documentation, hand calculations, models (with inputs and outputs) and custom spreadsheets used to develop the forecasts must be included in the documentation. Forecasts based solely on “professional experience” or subjective observation will be rejected. Applications must include a completed Waste Heat/AB1685 spreadsheet, available from the Program Administrators’ websites, that calculates the waste heat utilization, minimum system efficiency and emissions requirements.

Example #1: Emissions Credit for 360 kW IC Engine Generator

A 360 kW IC engine generator set is proposed to supply electric power and heat to a furniture manufacturing facility. The system utilizes an intercooler chiller that is rated at 10 kW. Its full load fuel consumption is 4.4 MMBtu/hr LHV (4.8 MMBtu/hr HHV⁷⁶) and its full load waste heat recovery rate is 2.6 MMBtu/hr. Source testing documentation for the same generating system make/model and configuration, but from another site, indicate that the NO_x emissions from this unit are 0.16 lb/MWh. The generator is fueled with a Non-Renewable fuel and is not a fuel cell. The generator electric output follows the load of the Host Customers facility, but shuts down when the load falls below 40 kW, the minimum load of the generator. The Host Customer annual peak demand is approximately 400 kW. Waste heat from the generating system is used to deliver hot water for manufacturing process, equipment cleanup and space heating. Detailed analysis of the system and Host Customer load reveals that the system will be generating 1,715,000 kWh/yr at a

⁷⁵ Emissions credit calculation is based on the California Air Resources Board, Guidance for the Permitting of Electric Generation Technologies, Appendix D: Quantifying CHP Benefits, July 2002.

⁷⁶ For natural gas, LHV ≈ HHV x 0.9

capacity factor of 56%. The system will produce 12,730 MMBtu/yr of recovered waste heat to serve 12,400 MMBtu/yr of thermal load, however only 8,256 MMBtu/yr of waste heat is actual useful thermal output because of non-coincident monthly load. The system consumes 21,521 MMBtu/yr LHV and 23,673 MMBtu/yr HHV of fuel. Thus -

Minimum Operating Efficiency Requirement

P.U. Code 216.6 (a)

$$8,255,800,000 \text{ [Btu/yr]} / \{(1,715,000 \text{ [kWh/yr]} \times 3,413 \text{ [Btu/kWh]}) + 8,255,800,000 \text{ [Btu/yr]}\} = 58.5\% \geq 5\% \text{ **Passes**}$$

P.U. Code 216.6 (b)

$$\{(1,715,000 \text{ [kWh/yr]} \times 3,413 \text{ [Btu/kWh]}) + 0.5 \times 8,255,800,000 \text{ Btu/yr}\} / 21,520,800,000 \text{ [Btu/yr]} = 46.4\% \geq 42.5\% \text{ **Passes**}$$

AB 2778 Minimum Electric Efficiency

$$(360 \text{ [kW]} \times 3,414 \text{ [Btu/kWh]}) / 4,831,200 \text{ Btu/hr} = 25.4 \geq 40\% \text{ Fails}$$

Air Emissions Requirement

AB 1685 Minimum System Efficiency

$$\{(360 \text{ [kW]} \times 3,414 \text{ [Btu/kWh]}) + 2,598,000 \text{ [Btu/hr]}\} / 4,831,200 \text{ Btu/hr} = 79.2 \geq 60\% \text{ **Passes**}$$

AB 1685 NOx Emissions w/o Waste Heat Credit

$$0.16 \text{ [lb/MWh]} \leq 0.07 \text{ lb/MWh NOx **Fails**}$$

AB 1685 NOx Emissions w/ Waste Heat Credit

$$\{0.16 \text{ [lb/MWh]} \times .360 \text{ [MW]}\} / \{.360 \text{ [MW]} + (8,256 \text{ [MMBtu/yr]} / 3.4 \text{ [MMBtu/MWh]}) / 4,900 \text{ EFLH/yr}\} = 0.067 \text{ lb/MWh} \leq 0.07 \text{ lb/MWh NOx **Passes**}$$

The Minimum Operating Efficiency worksheet is designed to perform this calculation. Applications must include in their application a completed Minimum Operating Efficiency worksheet, which is available from the Program Administrators' websites.

Appendix C - Conversion of Emissions PPM to Lb/MWH

Procedure for Converting Emission Data to lb/MW-hr

Engines

Engine emission standards are typically expressed in terms of ppmv or in grams/brake horsepower-hour. Given below are factors to convert from ppm to grams/brake horsepower-hour and from grams/brake horsepower-hour to pound/megawatt hour.

The resulting answers will be approximate values since various default assumptions were used to develop natural gas default factors. The efficiency of the engine has the greatest effect on the concentration (ppmvd) to mass emission rate conversion (g/bhp-hr), which can vary from 20 to 40 percent. IN the calculations below, the efficiency is proportional to the engine brake specific fuel consumption.

PPM TO GM/Bhp-hr

$$\text{Concentration in exhaust by volume (dry)(ppmvd)} = \frac{\text{volume of pollutant (Vp)}}{\text{volume of exhaust (Ve)}} \times 10$$

$$Vp = \text{emission factor (g/bhp-hr)} \times \text{horsepower} \times (1/\text{molecular weight}) \times \text{molar volume} \times \text{conversion factors}$$

$$Ve = \text{F-factor for exhaust volume} \times \text{excess air correction} \times \text{engine brake specific fuel consumption} \times \text{horsepower} \times \text{conversion factors}$$

These factors can be reduced to: ppmvd = (gm/Bhp-hr) * factor

Reciprocating Engines, natural gas fueled⁷⁷

Pollutant	Factor
NOx	57-59
VOC	163-170
CO	93-97

Lean-burn Engines, natural gas fueled⁷⁸

Pollutant	Factor
NOx	80
VOC	212
CO	123

⁷⁷ Values taken from California Air Pollution Control Officers Association (CAPCOA) report: Portable Equipment Rule Piston IC Engine Technical Reference Document, 1995.

⁷⁸ Factors provided from Waukesha

GM/Bhp-hr to Lb/MW-hr

Gm/Bhp-hr x 3.07 = lb/MW-hr

- Includes 95 % factor for generator efficiency
- Conversion factors for grams to pounds and brake horsepower to watts

Gas Turbines

lb/MW-hr = (emission rate [lb/MMBtu]) x (3.413 [MMBtu/MWh]) / (efficiency)

2.5 ppmvd = 0.0093 lb/MMBtu for NO_x

2 ppmvd = 0.0027 lb/MMBtu for VOC

5 ppmvd = 0.013 lb/MMBtu for CO

Efficiency for central station power plant is 50%

Source: California Air Resources Board, Guidance for the Permitting of Electric Generation Technologies, Appendix C: Procedure for Converting Emission Data to lb/MW-hr, July 2002.

Appendix D – Conversion Tables for HVAC-Integrated S-TES

Before 1984		kW Offset Table with Source Multiplier of 1.														
8 SEER		Equipment Nominal Tonnage (In Tons)														
Climate Zone	1	1.5	2	3	3.5	4	5	6	7	7.5	8.5	9	10	12.5	15	20
1	1.0	1.6	2.3	3.5	4.2	4.8	6.1	7.3	8.6	9.2	10.5	11.1	12.4	15.5	18.7	25.0
2	1.4	2.3	3.1	4.8	5.6	6.5	8.2	9.8	11.5	12.4	14.1	14.9	16.6	20.8	25.0	33.4
3	1.3	2.1	2.9	4.5	5.3	6.0	7.6	9.2	10.8	11.5	13.1	13.9	15.5	19.4	23.3	31.2
4	1.4	2.2	3.0	4.6	5.4	6.2	7.8	9.5	11.1	11.9	13.5	14.3	15.9	20.0	24.0	32.1
5	1.4	2.2	3.0	4.6	5.4	6.2	7.8	9.4	11.0	11.8	13.4	14.2	15.8	19.8	23.8	31.8
6	1.4	2.2	3.0	4.7	5.5	6.3	7.9	9.6	11.2	12.0	13.7	14.5	16.1	20.2	24.3	32.5
7	1.4	2.2	3.1	4.7	5.5	6.4	8.0	9.7	11.3	12.1	13.8	14.6	16.3	20.4	24.5	32.8
8	1.4	2.2	3.1	4.7	5.5	6.4	8.0	9.7	11.3	12.1	13.8	14.6	16.3	20.4	24.5	32.8
9	1.4	2.2	3.0	4.7	5.5	6.3	7.9	9.6	11.2	12.0	13.7	14.5	16.1	20.2	24.3	32.5
10	1.5	2.3	3.2	4.9	5.8	6.7	8.4	10.1	11.9	12.7	14.5	15.3	17.1	21.4	25.7	34.4
11	1.5	2.4	3.3	5.1	6.0	6.9	8.6	10.4	12.2	13.1	14.9	15.7	17.5	22.0	26.4	35.3
12	1.4	2.3	3.1	4.8	5.7	6.5	8.2	9.9	11.6	12.5	14.2	15.0	16.7	21.0	25.2	33.7
13	1.4	2.2	3.1	4.7	5.5	6.4	8.0	9.7	11.3	12.1	13.8	14.6	16.3	20.4	24.5	32.8
14	1.5	2.3	3.2	4.9	5.8	6.7	8.4	10.1	11.9	12.7	14.5	15.3	17.1	21.4	25.7	34.4
15	1.6	2.5	3.4	5.2	6.1	7.0	8.9	10.7	12.5	13.4	15.3	16.2	18.0	22.5	27.1	36.2
16	1.4	2.2	3.0	4.6	5.4	6.2	7.8	9.5	11.1	11.9	13.5	14.3	15.9	20.0	24.0	32.1

1984 - 1991		kW Offset Table with Source Multiplier of 1.														
8.9 SEER		Equipment Nominal Tonnage (In Tons)														
Climate Zone	1	1.5	2	3	3.5	4	5	6	7	7.5	8.5	9	10	12.5	15	20
1	0.9	1.5	2.0	3.2	3.8	4.3	5.5	6.6	7.8	8.3	9.5	10.1	11.2	14.1	16.9	22.7
2	1.3	2.0	2.8	4.3	5.1	5.9	7.4	8.9	10.4	11.2	12.7	13.5	15.0	18.9	22.7	30.3
3	1.2	1.9	2.6	4.0	4.7	5.5	6.9	8.3	9.7	10.5	11.9	12.6	14.0	17.6	21.2	28.3
4	1.2	2.0	2.7	4.2	4.9	5.6	7.1	8.6	10.0	10.8	12.2	13.0	14.5	18.1	21.8	29.2
5	1.2	1.9	2.7	4.1	4.8	5.6	7.0	8.5	9.9	10.7	12.1	12.9	14.3	18.0	21.6	28.9
6	1.2	2.0	2.7	4.2	4.9	5.7	7.2	8.7	10.1	10.9	12.4	13.1	14.6	18.3	22.0	29.4
7	1.2	2.0	2.7	4.2	5.0	5.7	7.2	8.7	10.2	11.0	12.5	13.2	14.7	18.5	22.2	29.7
8	1.2	2.0	2.7	4.2	5.0	5.7	7.2	8.7	10.2	11.0	12.5	13.2	14.7	18.5	22.2	29.7
9	1.2	2.0	2.7	4.2	4.9	5.7	7.2	8.7	10.1	10.9	12.4	13.1	14.6	18.3	22.0	29.4
10	1.3	2.1	2.9	4.5	5.2	6.0	7.6	9.2	10.7	11.5	13.1	13.9	15.5	19.4	23.3	31.2
11	1.4	2.2	3.0	4.6	5.4	6.2	7.8	9.4	11.0	11.9	13.5	14.3	15.9	19.9	24.0	32.0
12	1.3	2.1	2.8	4.4	5.1	5.9	7.5	9.0	10.5	11.3	12.9	13.6	15.2	19.0	22.9	30.6
13	1.2	2.0	2.7	4.2	5.0	5.7	7.2	8.7	10.2	11.0	12.5	13.2	14.7	18.5	22.2	29.7
14	1.3	2.1	2.9	4.5	5.2	6.0	7.6	9.2	10.7	11.5	13.1	13.9	15.5	19.4	23.3	31.2
15	1.4	2.2	3.1	4.7	5.5	6.4	8.0	9.7	11.3	12.2	13.8	14.7	16.3	20.4	24.6	32.9
16	1.2	2.0	2.7	4.2	4.9	5.6	7.1	8.6	10.0	10.8	12.2	13.0	14.5	18.1	21.8	29.2

1992 - 2005		kW Offset Table with Source Multiplier of 1.														
9.7 SEER		Equipment Nominal Tonnage (In Tons)														
Climate Zone	1	1.5	2	3	3.5	4	5	6	7	7.5	8.5	9	10	12.5	15	20
1	0.8	1.3	1.9	2.9	3.5	4.0	5.1	6.1	7.2	7.7	8.8	9.3	10.4	13.0	15.7	21.0
2	1.2	1.9	2.6	4.0	4.7	5.4	6.8	8.2	9.7	10.4	11.8	12.5	13.9	17.4	21.0	28.1
3	1.1	1.7	2.4	3.7	4.4	5.0	6.4	7.7	9.0	9.7	11.0	11.7	13.0	16.3	19.6	26.2
4	1.1	1.8	2.5	3.8	4.5	5.2	6.6	7.9	9.3	10.0	11.3	12.0	13.4	16.8	20.2	27.0
5	1.1	1.8	2.4	3.8	4.5	5.1	6.5	7.8	9.2	9.9	11.2	11.9	13.2	16.6	20.0	26.7
6	1.1	1.8	2.5	3.9	4.6	5.3	6.6	8.0	9.4	10.1	11.4	12.1	13.5	16.9	20.4	27.3
7	1.1	1.8	2.5	3.9	4.6	5.3	6.7	8.1	9.5	10.2	11.6	12.2	13.6	17.1	20.6	27.5
8	1.1	1.8	2.5	3.9	4.6	5.3	6.7	8.1	9.5	10.2	11.6	12.2	13.6	17.1	20.6	27.5
9	1.1	1.8	2.5	3.9	4.6	5.3	6.6	8.0	9.4	10.1	11.4	12.1	13.5	16.9	20.4	27.3
10	1.2	1.9	2.7	4.1	4.8	5.6	7.0	8.5	9.9	10.7	12.1	12.8	14.3	17.9	21.6	28.9
11	1.2	2.0	2.7	4.2	5.0	5.7	7.2	8.7	10.2	11.0	12.5	13.2	14.7	18.4	22.2	29.6
12	1.2	1.9	2.6	4.0	4.8	5.5	6.9	8.3	9.8	10.5	11.9	12.6	14.0	17.6	21.2	28.3
13	1.1	1.8	2.5	3.9	4.6	5.3	6.7	8.1	9.5	10.2	11.6	12.2	13.6	17.1	20.6	27.5
14	1.2	1.9	2.7	4.1	4.8	5.6	7.0	8.5	9.9	10.7	12.1	12.8	14.3	17.9	21.6	28.9
15	1.3	2.1	2.8	4.4	5.1	5.9	7.4	9.0	10.5	11.3	12.8	13.6	15.1	18.9	22.8	30.4
16	1.1	1.8	2.5	3.8	4.5	5.2	6.6	7.9	9.3	10.0	11.3	12.0	13.4	16.8	20.2	27.0

2006-2009 12 SEER	kW Offset Table with Source Multiplier of 1.															
	Equipment Nominal Tonnage (In Tons)															
Climate Zone	1	1.5	2	3	3.5	4	5	6	7	7.5	8.5	9	10	12.5	15	20
1	0.6	1.1	1.5	2.4	2.8	3.3	4.2	5.1	5.9	6.4	7.3	7.7	8.6	10.8	13.0	17.4
2	0.9	1.5	2.1	3.3	3.9	4.5	5.6	6.8	8.0	8.6	9.8	10.4	11.5	14.5	17.4	23.3
3	0.9	1.4	2.0	3.1	3.6	4.2	5.3	6.4	7.5	8.0	9.1	9.7	10.8	13.5	16.3	21.8
4	0.9	1.5	2.0	3.2	3.7	4.3	5.4	6.6	7.7	8.3	9.4	10.0	11.1	13.9	16.8	22.5
5	0.9	1.4	2.0	3.1	3.7	4.2	5.4	6.5	7.6	8.2	9.3	9.9	11.0	13.8	16.6	22.2
6	0.9	1.5	2.0	3.2	3.8	4.3	5.5	6.6	7.8	8.3	9.5	10.1	11.2	14.1	16.9	22.7
7	0.9	1.5	2.1	3.2	3.8	4.4	5.5	6.7	7.9	8.4	9.6	10.2	11.3	14.2	17.1	22.9
8	0.9	1.5	2.1	3.2	3.8	4.4	5.5	6.7	7.9	8.4	9.6	10.2	11.3	14.2	17.1	22.9
9	0.9	1.5	2.0	3.2	3.8	4.3	5.5	6.6	7.8	8.3	9.5	10.1	11.2	14.1	16.9	22.7
10	1.0	1.6	2.2	3.4	4.0	4.6	5.8	7.0	8.2	8.8	10.1	10.7	11.9	14.9	17.9	24.0
11	1.0	1.6	2.2	3.5	4.1	4.7	6.0	7.2	8.5	9.1	10.3	11.0	12.2	15.3	18.4	24.7
12	0.9	1.5	2.1	3.3	3.9	4.5	5.7	6.9	8.1	8.7	9.9	10.5	11.7	14.6	17.6	23.6
13	0.9	1.5	2.1	3.2	3.8	4.4	5.5	6.7	7.9	8.4	9.6	10.2	11.3	14.2	17.1	22.9
14	1.0	1.6	2.2	3.4	4.0	4.6	5.8	7.0	8.2	8.8	10.1	10.7	11.9	14.9	17.9	24.0
15	1.0	1.7	2.3	3.6	4.2	4.9	6.1	7.4	8.7	9.3	10.6	11.3	12.5	15.7	18.9	25.3
16	0.9	1.5	2.0	3.2	3.7	4.3	5.4	6.6	7.7	8.3	9.4	10.0	11.1	13.9	16.8	22.5

2010-2014 13 SEER	kW Offset Table with Source Multiplier of 1.															
	Equipment Nominal Tonnage (In Tons)															
Climate Zone	1	1.5	2	3	3.5	4	5	6	7	7.5	8.5	9	10	12.5	15	20
1	0.4	0.8	1.1	1.8	2.1	2.4	3.1	3.8	4.4	4.8	5.5	5.8	6.5	8.1	9.8	13.2
2	0.6	1.1	1.5	2.4	2.9	3.3	4.2	5.1	6.0	6.5	7.4	7.8	8.7	10.9	13.2	17.6
3	0.6	1.0	1.4	2.3	2.7	3.1	3.9	4.8	5.6	6.0	6.9	7.3	8.1	10.2	12.3	16.5
4	0.6	1.0	1.5	2.3	2.8	3.2	4.1	4.9	5.8	6.2	7.1	7.5	8.4	10.5	12.7	17.0
5	0.6	1.0	1.5	2.3	2.7	3.2	4.0	4.9	5.7	6.1	7.0	7.4	8.3	10.4	12.5	16.8
6	0.6	1.1	1.5	2.4	2.8	3.2	4.1	5.0	5.8	6.3	7.1	7.6	8.4	10.6	12.8	17.1
7	0.6	1.1	1.5	2.4	2.8	3.3	4.1	5.0	5.9	6.3	7.2	7.7	8.5	10.7	12.9	17.3
8	0.6	1.1	1.5	2.4	2.8	3.3	4.1	5.0	5.9	6.3	7.2	7.7	8.5	10.7	12.9	17.3
9	0.6	1.1	1.5	2.4	2.8	3.2	4.1	5.0	5.8	6.3	7.1	7.6	8.4	10.6	12.8	17.1
10	0.7	1.1	1.6	2.5	3.0	3.4	4.3	5.3	6.2	6.6	7.6	8.0	8.9	11.2	13.5	18.1
11	0.7	1.2	1.6	2.6	3.1	3.5	4.5	5.4	6.4	6.8	7.8	8.3	9.2	11.6	13.9	18.6
12	0.7	1.1	1.6	2.5	2.9	3.4	4.3	5.2	6.1	6.5	7.4	7.9	8.8	11.0	13.3	17.8
13	0.6	1.1	1.5	2.4	2.8	3.3	4.1	5.0	5.9	6.3	7.2	7.7	8.5	10.7	12.9	17.3
14	0.7	1.1	1.6	2.5	3.0	3.4	4.3	5.3	6.2	6.6	7.6	8.0	8.9	11.2	13.5	18.1
15	0.7	1.2	1.7	2.7	3.1	3.6	4.6	5.6	6.5	7.0	8.0	8.5	9.4	11.9	14.3	19.1
16	0.6	1.0	1.5	2.3	2.8	3.2	4.1	4.9	5.8	6.2	7.1	7.5	8.4	10.5	12.7	17.0

6/2014 After 14 SEER	kW Offset Table with Source Multiplier of 1.															
	Equipment Nominal Tonnage (In Tons)															
Climate Zone	1	1.5	2	3	3.5	4	5	6	7	7.5	8.5	9	10	12.5	15	20
1	0.4	0.8	1.1	1.8	2.1	2.4	3.1	3.8	4.4	4.8	5.5	5.8	6.5	8.1	9.8	13.2
2	0.6	1.1	1.5	2.4	2.9	3.3	4.2	5.1	6.0	6.5	7.4	7.8	8.7	10.9	13.2	17.6
3	0.6	1.0	1.4	2.3	2.7	3.1	3.9	4.8	5.6	6.0	6.9	7.3	8.1	10.2	12.3	16.5
4	0.6	1.0	1.5	2.3	2.8	3.2	4.1	4.9	5.8	6.2	7.1	7.5	8.4	10.5	12.7	17.0
5	0.6	1.0	1.5	2.3	2.7	3.2	4.0	4.9	5.7	6.1	7.0	7.4	8.3	10.4	12.5	16.8
6	0.6	1.1	1.5	2.4	2.8	3.2	4.1	5.0	5.8	6.3	7.1	7.6	8.4	10.6	12.8	17.1
7	0.6	1.1	1.5	2.4	2.8	3.3	4.1	5.0	5.9	6.3	7.2	7.7	8.5	10.7	12.9	17.3
8	0.6	1.1	1.5	2.4	2.8	3.3	4.1	5.0	5.9	6.3	7.2	7.7	8.5	10.7	12.9	17.3
9	0.6	1.1	1.5	2.4	2.8	3.2	4.1	5.0	5.8	6.3	7.1	7.6	8.4	10.6	12.8	17.1
10	0.7	1.1	1.6	2.5	3.0	3.4	4.3	5.3	6.2	6.6	7.6	8.0	8.9	11.2	13.5	18.1
11	0.7	1.2	1.6	2.6	3.1	3.5	4.5	5.4	6.4	6.8	7.8	8.3	9.2	11.6	13.9	18.6
12	0.7	1.1	1.6	2.5	2.9	3.4	4.3	5.2	6.1	6.5	7.4	7.9	8.8	11.0	13.3	17.8
13	0.6	1.1	1.5	2.4	2.8	3.3	4.1	5.0	5.9	6.3	7.2	7.7	8.5	10.7	12.9	17.3
14	0.7	1.1	1.6	2.5	3.0	3.4	4.3	5.3	6.2	6.6	7.6	8.0	8.9	11.2	13.5	18.1
15	0.7	1.2	1.7	2.7	3.1	3.6	4.6	5.6	6.5	7.0	8.0	8.5	9.4	11.9	14.3	19.1
16	0.6	1.0	1.5	2.3	2.8	3.2	4.1	4.9	5.8	6.2	7.1	7.5	8.4	10.5	12.7	17.0

Appendix E – Updates to the GHG Emissions Factor Section 379.6(b)(2) as Amended by Senate Bill 861

SGIP GHG Emissions Eligibility Factor – The Equation

We find that to calculate the GHG emissions eligibility factor, it is reasonable to use the following equation:

$$\text{GHG EF} = (0.5(\text{EROLF} * (1 - \text{WFP}) + \text{EROP} * \text{WFP}) + 0.5 * (1 - \text{RPS}\% * (1 - \text{LLF})) * (\text{ERBLF} * (1 - \text{WFP}) + \text{ERBP} * \text{WFP})) / (1 - \text{LLF})$$

Where:

GHG EF = greenhouse gas emission factor

EROLF = operating margin emission rate of load-following plants = 382 kgCO₂/MWh

WFP = weighting factor for peaker plants = 10%

EROP = operating margin emission rate of peaking plants = 544 kgCO₂/MWh

RPS% = average RPS portfolio requirement for the program year (i.e., project years 6 – 10)

ERBLF = build margin emission rate of load-following plants = 368 kgCO₂/MWh

ERBP = build margin emission rate of peaking plants = 524 kgCO₂/MWh

LLF = line loss factor = 8.4%

Substituting the adopted values for Program Year 2016 into this equation yields:

$$\text{GHG EF} = (0.5 (382 \text{ kgCO}_2/\text{MWh} * (1 - 0.10) + 544 \text{ kgCO}_2/\text{MWh} * 0.10) + 0.5 (1 - 0.40 * (1 - 0.084)) * (368 \text{ kgCO}_2/\text{MWh} * (1 - 0.10) + 524 \text{ kgCO}_2/\text{MWh} * 0.10)) / (1 - 0.084)$$

$$\text{GHG EF} = 350 \text{ kgCO}_2/\text{MWh}$$

Share of Avoided Renewables in Calculating SGIP GHG Emissions Eligibility Threshold

Assumed RPS Targets 2020 – 2030, with and without Line Loss Adjustments

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Nominal RPS	33.0	34.8	36.5	38.3	40.0	41.7	43.3	45.0	46.7	48.3	50.0
	%	%	%	%	%	%	%	%	%	%	%
Adjusted RPS	30.2	31.8	33.4	35.0	36.6	38.2	39.7	41.2	42.8	44.2	45.8
	%	%	%	%	%	%	%	%	%	%	%

Note: The adjusted RPS is calculated as the product of the nominal percentage and (1 – the line loss factor)

Average Share of Avoided Renewable Energy in Build Margin by Program Year

Program Year	2016	2017	2018	2019	2020
Build Margin RPS, Nominal	40.0%	41.7%	43.3%	45.0%	46.7%
Build Margin RPS, Adjusted for line losses	36.6%	38.2%	39.7%	41.2%	42.7%

Note: The build margin for each program year is the simple average of the RPS percentages for years 6 – 10 after the program year. For example, the program year 2016 average share of renewable energy avoided equals the average of the RPS targets for 2022 through 2026.

SGIP GHG Eligibility Emissions Factors, kgCO2/MWh

Program Year	2016	2017	2018	2019	2020
10-Year Average	350	347	344	340	337
First-Year Average	334	332	329	325	321

Calculation of Minimum Round-Trip Efficiency

Line Loss On Peak	10.3%				
Line Loss Off Peak	5.3%				
Degradation Rate	1.0%				
First Year RTE	69.6%				
Ten-Year Avg RTE	66.5%				
Sum of Ann'l GHGs	0				

Year	Off-peak ER	On-peak ER	GHG emitted	GHG avoided	Net GHG per MWh
1	382	544	580	606	-27
2	382	544	585	606	-21
3	382	544	591	606	-15
4	382	544	597	606	-9
5	382	544	603	606	-3
6	368	524	587	584	3
7	368	524	593	584	9
8	368	524	599	584	15
9	368	524	605	584	21
10	368	524	611	584	27

Appendix F – Incentive rate for large-scale storage projects claiming the ITC at all incentive levels

	\$/Wh								
Non-ITC	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10
ITC	0.36	0.32	0.29	0.25	0.22	0.18	0.14	0.11	0.07