DOCKETED

Docket Number:	16-NSHP-01
Project Title:	Continuation of the New Solar Homes Partnership Program
TN #:	217064
Document Title:	Proposed NSHP Guidebook Tenth Edition Revised Clean
Description:	This is the proposed New Solar Homes Partnership Guidebook, Tenth Edition, Revised clean version
Filer:	Judi Carter
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	4/14/2017 3:06:04 PM
Docketed Date:	4/14/2017

California Energy Commission

COMMISSION GUIDEBOOK

NEW SOLAR HOMES PARTNERSHIP GUIDEBOOK

TENTH EDITION- REVISED

California Energy Commission

Edmund G. Brown Jr., Governor

April 2017 | CEC-300-2017-047-ED10-CMF-REV

California Energy Commission

Robert B. Weisenmiller, Ph.D.
Chair

Karen Douglas, J.D.
J. Andrew McAllister, Ph.D.
David Hochschild
Janea A. Scott
Commissioners

Geoffrey Dodson
Elizabeth Hutchison
Katharine Larson
Joseph Omoletski
Primary Authors

Payam Narvand
Supervisor

Natalie Lee
Office Manager
RENEWABLE ENERGY OFFICE

Courtney Smith
Deputy Director
RENEWABLE ENERGY DIVISION

Robert P. Oglesby
Executive Director

These guidelines were formally adopted by the California Energy Commission on December 13, 2006, pursuant to Public Resources Code Sections 25744, 25744.5, 25747, and 25780 through 25784, and subsequently revised pursuant to this authority on July 11, 2007, August 21, 2008, January 27, 2010, April 7, 2010, January 12, 2012, September 12, 2012, April 10, 2013, December 11, 2013, August 27, 2014, July 8, 2015, and March 8, 2017.

ABSTRACT

This guidebook details the eligibility requirements, rules, and process for reserving and claiming an incentive under the New Solar Homes Partnership Program. The New Solar Homes Partnership Program is part of a statewide solar program known as the California Solar Initiative and provides financial incentives for installing solar energy systems on new residential buildings. Incentives from the New Solar Homes Partnership Program are intended to help create a self-sustaining market for solar homes that incorporate high levels of energy efficiency and high-performing solar energy systems. Applicants are encouraged to achieve energy efficiency levels greater than the requirements of the California Building Energy Efficiency Standards, Title 24, Part 6. Incentives are determined based on the expected performance of the solar energy system and the level of documented building energy efficiency.

Keywords: New Solar Homes Partnership, NSHP, Energy Commission, PV, solar energy system, energy efficiency, standards, Title 24 Part 6, tier, incentive, CECPV Calculator, HERS Rater, field verification, shading, module, inverter, plan check

Please use the following citation for this report:

Dodson, Geoffrey, Elizabeth Hutchison, Katharine Larson, and Joseph Omoletski. 2017. *New Solar Homes Partnership Guidebook (Tenth Edition)*. California Energy Commission. CEC-300-2017-047-ED10-CMF.

TABLE OF CONTENTS

What's New in This Guidebook? ix

Incentive Levels ix
Incentive Calculation ix
Incentive Disclosure Requirement ix
Energy Efficiency ix
PV System Eligibility x
PV System Verification x
Established Installer Designation x
Affordable Housing Projects x
General Program Changes x

CHAPTER I: Program Overview 1

A. NSHP Program Budget 2
B. Renewable Energy Credits/Certificates 3
C. Applicability of Guidebook Changes to Existing Applications 3

CHAPTER II: 5

Program Eligibility Requirements 5

A. Eligible Service Territories 5
B. Eligible Project Types 5
C. Ineligible Project Types 6
D. Technology and System Ownership 7
E. Grid Interconnection 7
F. System Components 7
G. Meters 8
H. System Size 8
I. System Performance 9
J. System Installation 9
K. Warranty Requirements 9
L. Energy Efficiency Requirements 10
   1. ***How to Determine Energy Standards*** *11*
   2. ***Requirements for Projects Subject to the 2016 Energy Standards*** *11*
   3. ***Requirements for Projects Subject to Previous Updates of the Energy Standards*** *17*
   4. ***Energy Efficiency Requirements for Eligible Common Areas*** *19*
   5. ***Utility New Construction Energy Efficiency Program Participation*** *20*
   6. ***Quality Assurance Plan Check*** *22*
   7. ***Multiple Buildings on Same Meter*** *22*

CHAPTER III: Incentive Calculations and Structure 23

A. Market-Rate Housing Incentive Structure 23
B. Affordable Housing Incentive Structure 24
C. Flexible Installation Incentive Calculation 25
D. Incentive Calculation for Code-Compliant Projects Using PV to Meet the *2016 Energy Standards* 26
   1. ***Using NSHP-Ineligible Equipment to Offset Compliance Size*** *27*
   2. ***Virtual Net Energy Metering*** *28*
E. Incentive for Projects Located in Disadvantaged Communities 28

F. NSHP Incentive Amount Cap 29
G. Change in Incentive Level 30
H. Changes to the Incentive After Reservation 30
1. Changes to System Performance *30*
2. Adding Solar Energy System Sites to an Existing Reservation *31*
I. Non-NSHP Incentives 32

CHAPTER IV: Reservation Process 33

A. NSHP Application Process 33
B. NSHP Application Web Tool 36
C. Established Installer Designation 36
D. Types of Reservations 37
1. 36-Month Reservation *37*
2. 18-Month Reservation *37*
E. Forms and Documentation 37
1. Reservation Application Form (NSHP-1) *38*
2. Proof of Newly Constructed Residential Building *38*
3. Flexible Installation Incentive Documentation *38*
4. ***Energy Efficiency Documentation (CF-1R or PERF-1)*** *38*
5. Installation Contract *39*
6. NSHP Incentive Disclosure Affidavit *40*
7. NSHP Established Installer Reservation Form *41*
8. Payee Data Record (STD-204) *41*
F. Additional Requirements for Affordable Housing Projects 41
1. Regulatory Agreement *42*
2. Individual Meter Requirement *43*
3. Maintenance and Monitoring Plan *43*
4. Projects in Disadvantaged Communities *44*
G. System Size Justifications for Common Area Systems 44
H. Additional Information for All Reservation Applications 44
1. Project-Level Funding *44*
2. Funding Availability *45*
3. Application Errors *46*
4. Incomplete Applications *46*
5. Reapply Process *46*
6. Where to Send Reservations *47*
7. Reservation Transfers *47*
8. Reservation Funding Decrease Schedule *47*
9. Reservation Cancellations *48*

CHAPTER V: PV System and Energy Efficiency Verifications 49

A. PV System Verification 49
1. Background *49*
2. Responsibilities *52*
3. Relationship to Other Codes, Standards, and Verification *52*
4. FI Field Verification and Diagnostic Testing Process *52*
5. PV Installer Testing Protocols *53*
6. HERS Rater Testing Protocols *54*
B. Energy Efficiency Verifications 55
1. Code-Compliant Verifications (2016/2013 Energy Standards) *55*

2. Tier I/II Verifications (2013/2008 Energy Standards) *55*
3. Additional Energy Features Checklist Verification Guidelines *56*

CHAPTER VI: Payment Process **58**

A. Forms and Documentation 59
1. Payment Claim Form (NSHP-2) *59*
2. Proof of System Interconnection With Utility Grid *59*
3. Proof of Energy Efficiency Verification—Final Building Permit or Completed Energy Efficiency Field Verifications (CF-3R, NSHP EE-3 Forms) *60*
4. PV Field Verification Documentation (FI-2/FI-2E, FI-3 Forms) *60*
5. Revised NSHP FI-1 (If Applicable) *61*
6. Ten-Year Warranty and Final Cost Confirmation (NSHP-3) *61*
7. Lease Agreement or Power Purchase Agreement (PPA) *61*
B. Additional Information on Payment Claims 63
1. Switching to FI If a Reservation Is Under a Previous Guidebook *64*
2. Adding to Existing Systems *64*
3. Claiming an Incentive Payment Without a Prior Reservation *64*

APPENDIX A: Administration **A-1**

A. Authority A-1
B. Interpretation A-1
C. Effective Date A-1
D. Substantive Changes A-1
E. Approval and Cancellation of NSHP Reservations A-2
F. Funding Award Payments A-2
G. Audits A-2
H. Record Retention A-3
I. Use and Disclosure of Information and Records A-3
J. Tax Consequences A-4
K. Reconsideration of Funding Awards, Reservation Cancellations A-4
L. Disputes of Incentive Payments A-6
M. Enforcement Action A-7
N. Arbitration A-8
O. Limited Extensions of Time A-9
P. HERS Provider Process for Receiving NSHP Approval of HERS Registry A-10

APPENDIX B: Resources **B-1**

A. NSHP Program Participants B-1
B. NSHP Program Administrator Contact Information and Other Useful Resources B-2
C. Plan Check Checklist B-2

APPENDIX C: Energy Efficiency Requirements by Building Occupancy **C-1**

APPENDIX D: PV System Field Verification and Diagnostic Testing Methods **D-1**

A. Background D-1
B. Field Verification Visual Inspection D-1
C. Shading Verification D-4
D. Verification of System Performance D-7

APPENDIX E: NSHP FORMS **E-1**

LIST OF FIGURES

FIGURE 2-1: CALIFORNIA CLIMATE ZONES 12
FIGURE 2-2: LOCATION OF PHOTOVOLTAIC OFFSET ON *2016 ENERGY STANDARDS* CF-1R 13
FIGURE 2-3: *2016 ENERGY STANDARDS* SINGLE FAMILY CF-1R GENERAL INFORMATION 14
FIGURE 2-4: *2016 ENERGY STANDARDS* SINGLE-FAMILY CF-1R ENERGY USE SUMMARY 15
FIGURE 2-5: *2016 ENERGY STANDARDS* MULTIFAMILY CF-1R GENERAL INFORMATION 15
FIGURE 2-6: *2016 ENERGY STANDARDS* MULTIFAMILY CF-1R ENERGY USE SUMMARY 16
FIGURE 2-7: SAMPLE *2013 ENERGY STANDARDS* CF-1R COMPLIANCE MARGIN 17
FIGURE 4-1: APPLICATION PROCESS FLOW CHART FOR NSHP CODE-COMPLIANT PROJECTS 35
FIGURE B-1: SINGLE ORIENTATION PLAN ENERGY USE SUMMARY B-4
FIGURE B-2: MULTIPLE ORIENTATION PLAN ENERGY USE SUMMARY B-5
FIGURE D-1: AZIMUTH OF THE PV ARRAY D-2
FIGURE D-2: EXAMPLE PLOT PLAN D-3
FIGURE D-3: COMPASS WITH A SIGHTING FEATURE D-4
FIGURE D-4: THE MINIMAL SHADING CRITERION ARTISTIC DEPICTION OF "H" AND "D" D-5
FIGURE D-5: EXAMPLE OF POINTS WHERE MEASUREMENT SHALL BE MADE USING A SOLAR ASSESSMENT TOOL D-7
FIGURE D-6: EXAMPLE TABLE OF EXPECTED AC POWER OUTPUT FROM FI CALCULATOR (IN WATTS) D-9

LIST OF TABLES

TABLE 2-1: NSHP COMPLIANCE SIZE FOR SINGLE-FAMILY HOMES UP TO 2,500 FT^2 14
TABLE 2-2: RESERVATION DOCUMENTS AND PROCESSES WAIVED FOR PROJECTS PARTICIPATING IN A UTILITY NEW CONSTRUCTION ENERGY EFFICIENCY PROGRAM 21
TABLE 2-3: PAYMENT DOCUMENTS WAIVED FOR PROJECTS PARTICIPATING IN A UTILITY NEW CONSTRUCTION ENERGY EFFICIENCY PROGRAM 21
TABLE 3-1: AVAILABLE INCENTIVE LEVEL TIERS BY ENERGY STANDARDS 23
TABLE 3-2: FI INCENTIVE LEVELS AND RELATED RESERVATION VOLUMES 24
TABLE 3-3: FI INCENTIVE LEVELS FOR AFFORDABLE HOUSING PROJECTS 25
TABLE 3-4: CLIMATE ZONE PRODUCTION FACTORS FOR FI INCENTIVE CALCULATION 26
TABLE B-1: PRESCRIPTIVE PACKAGE REQUIREMENTS (HPA AND HPW) B-1

What's New in This Guidebook?

Below are the major changes in this edition of the *New Solar Homes Partnership Guidebook* (*NSHP Guidebook*) as compared with the July 2015 ninth edition. These changes will become effective on March 8, 2017.

Incentive Levels

- Ends incentive level decline at Step 8 for both market-rate and affordable housing projects.
- Increases incentive rates for affordable housing projects.

Incentive Calculation

- Uses the Flexible Installation (FI) Calculator to determine project incentive. This calculator multiplies the AC system size by the incentive level that applies to the project. This calculation adjusts the incentive to take into account performance based on the climate zone of the project and shading.
- Introduces an additional incentive for eligible affordable housing projects located in disadvantaged communities.
- Discontinues the Energy Commission's PV (CECPV) calculator for new applications.
- Discontinues the additional incentive for west-facing systems.
- Discontinues the partial payment incentive process.

Incentive Disclosure Requirement

- Ensures the realized incentive benefit to the end-use customer when payee is the installer, equipment seller, or third-party system owner for upholding program goals.

Energy Efficiency

- Requires applications meeting the *2016 Building Energy Efficiency Standards* (*2016 Energy Standards*), under Title 24, Part 6 to be code-compliant. This is the only efficiency tier available for applications meeting the *2016 Energy Standards*.
- Articulates changes to the *2016 Energy Standards* as they relate to NSHP. If a photovoltaic (PV) system is used for compliance under the *2016 Energy Standards*, only the portion of the system that exceeds the size required to claim the Title 24 PV compliance credit (PV credit) can be eligible for incentives.
- Removes 30 percent space cooling requirement to achieve the Tier II energy efficiency level for projects using the *2013 Energy Standards*.
- Restricts *2013 Energy Standards* common area projects to code-compliant incentive level only.
- Restricts *2008 Energy Standards* common area projects to Tier I incentive level only.
- Allows code-compliant projects to provide proof of energy efficiency verification through either the certificate of occupancy or completion of the required Certificate of Verification (CF-3R) Forms in an approved HERS Provider registry.

PV System Eligibility

- Limits eligibility to systems installed with azimuths between 90 degrees and 280 degrees.
- Increases the solar permit application time from 60 days to 120 days after the issue date of a certificate of occupancy.

PV System Verification

- Increases allowed third-party verification sample group size to 1 in 15 (open group).
- Defines the NSHP HERS Registry approval process.
- Clarifies the HERS sampling approach used for NSHP solar system verification.

Established Installer Designation

- Creates the Established Installer designation for PV installers that meet the criteria specified in the guidebook and submit a request to the Energy Commission.
- Allows Established Installers to submit the Established Installer Lease/PPA form, which is an affidavit signed by the payee's authorized representative that can be submitted in place of a final lease agreement/power purchase agreement (PPA) certifying that the NSHP requirements have been incorporated into the lease agreement/PPA for each address.
- Allows Established Installers to complete an attestation for each site certifying the system meets program requirements and operates satisfactorily in lieu of the NSHP Flexible Installation (FI-2) form.
- The Energy Commission reserves the right to bar noncompliant installers from future program participation.

Affordable Housing Projects

- Removes the requirement for tax-exempt status to allow all affordable housing residential projects with a qualifying regulatory agreement to receive the affordable housing incentive rate for the residential units that are subject to the conditions of the regulatory agreement.
- Reintroduces the common area incentive for *2016* and *2013 Energy Standards* affordable housing common area projects as long as 80 percent or more of residential units in the project are subject to the conditions of the regulatory agreement.

General Program Changes

- Revises the NSHP-1, NSHP-2, and NSHP-3 forms.
- Revises the requirement for the final cost documentation.
- Revises requirements for lease agreements.
- Allows applicants with an approved project reservation that has not received an approved payment claim to request that the project be subject to the reservation criteria and processes identified in this *NSHP Guidebook, Tenth Edition*. Applicants must notify the Energy Commission in writing or email if they wish to be subject to the Tenth Edition Guidebook.

Outstanding Issues

- The Energy Commission is transitioning to a new financial information management system known as the Financial Information System for California (FI$Cal). This new system is being implemented statewide for all State of California agencies and departments, and will affect the Energy Commission's budgeting, accounting, procurement, and cash management processes. As a result of the transition to FI$Cal, some of the Energy Commission's internal processes for issuing NSHP reservations, encumbering funds for reservations, and making payments for reservations may be affected and require changes to the NSHP Guidebook. The Energy Commission will inform stakeholders and member of the public of any needed changes to the NSHP processes as it implements and moves forward with the new FI$Cal system.

CHAPTER I:
Program Overview

The New Solar Homes Partnership (NSHP) provides financial incentives and other support for installing eligible solar energy systems on newly constructed residential buildings[1] that receive electricity from specified investor-owned utilities (IOUs).[2] The California Energy Commission implements the NSHP in coordination with the California Public Utilities Commission (CPUC) as part of the overall California Solar Initiative (CSI). This guidebook describes the requirements to receive incentives for constructing energy-efficient solar homes under the NSHP. This guidebook becomes effective upon adoption at an Energy Commission business meeting.

The NSHP strives to create a self-sustaining market for solar homes where builders incorporate high-performing solar energy systems into highly energy-efficient new homes. The NSHP provides financial incentives and nonfinancial assistance in the form of builder and market support to accomplish this goal.

The NSHP is part of the comprehensive statewide solar program: California Solar Initiative (CSI). Senate Bill 1(SB 1)[3] establishes three goals for the CSI:

- Install 3,000 megawatts (MW) of distributed solar electric capacity in California by the end of 2016.
- Establish a self-sufficient solar industry in which solar energy systems are a viable mainstream option in 10 years.
- Place solar energy systems on 50 percent of new homes in 13 years. The NSHP goal is to add 360 MW[4] of installed solar electric capacity in California by the end of the program.

The NSHP provides two incentive structures: one for conventional or market-rate housing, including common areas; and one for affordable housing residential unit and common area projects. The NSHP offers a higher incentive to affordable housing projects because the affordable housing industry often faces more difficulties in the financing and incorporation of solar energy systems in its developments than do conventional housing developments.[5]

To qualify for an incentive, both the newly constructed residential building and the installed solar energy system must meet the program requirements included in this guidebook, including being in compliance with the *Building Energy Efficiency Standards* (Energy Standards).

1 See Chapter II, Program Eligibility Requirements and the Glossary of Terms for the definition of residential buildings.
2 Eligible electric utilities are Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, and Golden State Water Company (doing business as Bear Valley Electric Service).
3 Senate Bill 1 (Murray, Chapter 132, Statutes of 2006), § 4, as codified in Public Resources Code Sections 25780 – 25784.
4 This number is calculated by dividing the NSHP budget identified in Senate Bill 1 by the overall CSI budget and multiplying that number by the overall CSI MW goal.
5 These higher incentives are provided consistent with Public Resources Code Section 25401.6.

The NSHP incentive amount is determined by key factors including equipment efficiency, the design of the system, and the energy efficiency level. The incentive is paid once the system is installed and operational and has met all program requirements.

By participating in the NSHP, applicants authorize the Energy Commission, during the life of the NSHP, to obtain information from the utility serving the project to verify compliance with program requirements, including requirements for system interconnection to the utility grid. In addition, the applicant must provide the Energy Commission with new homeowner contact information when requested by the Energy Commission.

Applicants are strongly encouraged to read and understand their responsibilities as described in these documents.

A. NSHP Program Budget

Although Senate Bill 1 (SB 1) established NSHP as a $400 million program under the CSI, the program relied on monies in the Renewable Resource Trust Fund (RRTF) that were allocated to the Energy Commission's Emerging Renewables Program, totaling nearly $282 million through 2011. This amount was short of the funding level identified in SB 1 for the NSHP.

To address this funding shortfall, on November 13, 2015, the Energy Commission requested the California Public Utilities Commission (CPUC) to continue the NSHP program pursuant to Public Utilities Code Section 2851 (e)(3). Section 2851 (e)(3) authorizes the CPUC to require Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company (IOUs) to continue the NSHP program under the guidelines established by the Energy Commission until the $400 million program budget in the law is reached. Section 2851 (e) (3) also authorizes the CPUC to designate a third party, including the Energy Commission, to administer the continuation of the NSHP program.

The CPUC considered the Energy Commission's request as part of CPUC Rulemaking 12-11-005 and on June 9, 2016, approved Decision 16-06-006,[6] which requires the IOUs to provide $111.78 million in funding from ratepayers for continuation of the NSHP program; designates the Energy Commission to serve as program administrator; and establishes administrative and oversight-related requirements for the continuation of the program.

In 2015, Senate Bill 83 (Committee on Budget and Fiscal Review, Chapter 24, Statutes of 2015) extended the life of the NSHP. SB 83 requires any funding made available for the continuation of the NSHP pursuant to Public Utilities Code Section 2851(e)(3) to be encumbered through the issuance of reservations no later than June 1, 2018, and disbursed no later than December 31, 2021. Any funding not encumbered by June 1, 2018, will be returned to the ratepayers.

6 http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M163/K266/163266780.PDF.

CPUC's Decision 16-06-006 states that the Energy Commission is responsible for making incentive payments only if the IOUs transfer sufficient funds to cover the incentive payments. IOUs are required to transfer funds to the Energy Commission after an applicant's request for payment has been approved by the Energy Commission. If, for any reason, the IOUs do not transfer sufficient funds to cover the payment, the Energy Commission is not required to pay the applicant nor is the Energy Commission liable on the IOUs' behalf for making the payment.

B. Renewable Energy Credits/Certificates

When electricity is generated using an eligible renewable energy resource, two commodities are created: electricity and renewable energy credits (also referred to as *renewable energy certificates*, or *RECs*) representing the nonenergy, environmental attributes associated with the electricity. For the state's Renewables Portfolio Standard, a renewable energy credit is defined to include "…all renewable and environmental attributes associated with the production of electricity from an eligible renewable energy resource…"[7]

The Energy Commission recognizes that owners of solar energy systems, including those participating in the NSHP, may assert claims concerning renewable energy credits attributed to their solar energy systems. However, the Energy Commission has established no rules or policies governing the creation, ownership, or disposition of any such renewable energy credits. The Energy Commission does not require participants of the NSHP to relinquish their claims for renewable energy credits or to transfer ownership of any such credits to the Energy Commission or any other entity, as a condition of receiving NSHP funding.

C. Applicability of Guidebook Changes to Existing Applications

The rules below explain the applicability of this tenth edition of the *NSHP Guidebook,* to existing project reservations. For this section, "approved project" means a reservation application that the Energy Commission approved before the date the *NSHP Guidebook, Tenth Edition* becomes effective and that has a valid, unexpired reservation.

1. An approved project that has not received an approved payment claim for all solar energy system sites within the project will continue to be governed by the edition of the guidebook the project was approved under except as follows:
    a) Applicants may request the project be subject to the reservation criteria and processes identified in this tenth edition of the guidebook.
    b) Payment claims that have not been approved may be subject to the payment claim criteria and processes identified in this tenth edition of the guidebook.

7 Definition from the *Renewables Portfolio Standard Eligibility Guidebook, Ninth Edition,* pages 85-86.

2. Approved applications that have been paid or that have approved payment claims are not eligible for additional compensation, or to claim additional compensation for past reservation applications previously disapproved and required to reapply.

3. An applicant who submitted an application prior to the effective date of this tenth edition of the guidebook and did not receive approval of the application by the effective date may opt to follow either the previous edition or this tenth edition. The applicant must provide written or email notice to be subject to this tenth edition of the guidebook. If no notice is received by the Energy Commission prior to the reservation approval of the application by the Energy Commission, the application will be governed by the previous edition of the guidebook.

4. All applications submitted on or after the effective date will be governed by this tenth edition of the guidebook.

5. Effective in this guidebook, the market-rate housing and affordable housing incentive level structures will end at Level 8, whereas in previous guidebooks, the structures ended at Level 10. Levels 9 and 10 no longer exist; therefore the capacity in the Level 9 and 10 MW buckets will be reallocated to the Level 8 MW bucket for both the Market-Rate Housing and Affordable Housing incentive structures (Chapter III provides the current incentive tables).

Any market-rate projects submitted on or after the incentive level drop from Level 8 to 9 will receive the Level 8 incentive rate. If any market-rate payment claims requested additional funding under the *NSHP Guidebook, Ninth Edition* while market-rate incentive Level 9 was in effect, the additional funding requested was paid at the market rate Level 9 incentive rate. This does not affect the affordable housing structure since incentive levels in effect are not being discontinued. Once the entire incentive is paid for the requested amount of the NSHP rebate, additional funding may not be requested.

CHAPTER II:
Program Eligibility Requirements

This chapter covers the eligibility requirements necessary to receive incentives. Applicants may be either building owners or builders/developers only. Eligible solar energy systems are limited to systems that use flat-plate photovoltaic technology installed on newly constructed residential buildings that have achieved an Energy Commission-specified level of energy efficiency that meets or exceeds that required by the Energy Standards. For the energy efficiency requirements, see Chapter II, Section L.

A. Eligible Service Territories

To receive incentives through the NSHP program, the project must receive electric service through one of the following investor-owned utilities: PG&E, SCE, SDG&E, and BVES.

B. Eligible Project Types

Solar energy systems that service the following newly constructed residential buildings where the entire building meets the energy efficiency requirements described in Chapter II, Section L qualify for NSHP incentives:

- Single-family homes
- Duplexes
- Triplexes
- Condominiums
- Multifamily buildings (including market-rate and affordable housing projects)
- Mixed-use[8] buildings
- Common areas in single- and multifamily developments that are shown to be for the primary benefit of the residential occupants
- Large developments
- Small developments
- Solar NOT as a standard

To be eligible for NSHP incentives, a solar energy system must be installed in conjunction with the construction of a new residential building that is permanently fixed to the foundation. Permanent foundation is defined in the "Permanent Foundations Guide for Manufactured Housing" (HUD-7584).[9]

8 A *mixed-use building* has both residential and nonresidential occupancies (for example, first floor retail, upper floors multifamily residential).
9 U.S. Department of Housing and Urban Development, *Permanent Foundations Guide for Manufactured Housing*, HUD 7584, Issued September 1996.

Manufactured housing seeking eligibility for the NSHP must provide a "Notice of Manufactured Home or Commercial Modular Installation on a Foundation System" (HCD 433A) or a Certificate of Occupancy (HCD 513C) prior to approval of a payment claim.

In addition, the complete building permit application for the solar energy system should be submitted to the building code enforcement agency prior to the original occupancy of the newly constructed building but shall be submitted no later than 120 calendar days after the issuance of the occupancy permit, with original occupancy occurring on or after January 1, 2007.[10]

Moreover, only systems installed with an azimuth between 90 and 280 degrees, inclusive, shall be eligible for NSHP incentives.

C. Ineligible Project Types

NSHP incentives will not be provided to any solar energy system serving electrical loads in the nonresidential portions of a development, except in cases of mixed-use buildings or the common areas of residential developments that meet the requirements of Chapter II. Ineligible project types may include:

- Projects that applied for a solar permit more than 120 days after the issuance of the certificate of occupancy date (final building permit sign-off) for the new home (See Chapter II, Section B).
- Projects that have installed PV equipment more than six months before submitting an initial application to NSHP.
- Commercial buildings.
- Government buildings.
- Agriculture projects.
- Community solar projects.
- Solar farms.
- Schools.
- Churches.
- Transient housing.*

* Only buildings where 50 percent or more of the residential units are occupied for 30 days or more and are one of the following occupancy groups listed in the California Building Code, Title 24, Part 2[11] are eligible for NSHP funding:

- Occupancy Group R, Division 2
- Occupancy Group R, Division 2.1
- Occupancy Group R, Division 3
- Occupancy Group R, Division 3.1
- Occupancy Group R, Division 4

10 The 120-calendar-day limit may be extended under limited circumstances if the conditions for obtaining additional time under Appendix A, Section O are satisfied.
11 http://publicecodes.cyberregs.com/st/ca/st/b200v10/st_ca_st_b200v10_3_par046.htm.

The Energy Commission reserves the right to request that applicants provide documentation verifying that the project meets the preceding transient housing requirements.

D. Technology and System Ownership

Flat-plate photovoltaic technology is the only technology eligible to receive NSHP incentives. Eligible solar energy systems shall be 1 kilowatt (kW) alternating current (AC) or larger, measured after the inverter, which changes direct current to alternating current for customer use in homes and businesses. The solar energy system must be on the same site where the end-use customer's own electricity demand is located. It is the intent of the program that eligible systems remain interconnected to the utility distribution grid and operate at the original location for at least the 10-year warranty period. If the system is removed from the building on which it was originally installed within the 10-year warranty period, the Energy Commission may request repayment of all, or a portion of, the NSHP funding provided for that system.

Solar energy systems leased by the end-use customer or that supply electricity to the end-use customer through a power purchase agreement (PPA) may qualify for NSHP funding, provided the applicant and system satisfy the requirements in Chapter VI, Section A.

E. Grid Interconnection

Eligible solar energy systems must be permanently interconnected to the electrical distribution grid of the utility serving the customer's electrical load. The site where the system is installed must receive electrical distribution service from an existing in-state electrical corporation (PG&E, SCE, SDG&E, and BVES) collecting funds to support the program. The system interconnection to the utility distribution grid must also comply with applicable electrical codes, utility interconnection requirements, and metering requirements. The solar energy system shall not be interconnected to the utility distribution grid until the applicant has received a formal approval letter from the interconnection department of the applicant's electric utility.

Multifamily housing projects, both market rate and affordable, using virtual net metering[12] are eligible for NSHP incentives. For multifamily housing projects using virtual net metering, the residential units must meet the energy efficiency requirements in Chapter II, Section L.

F. System Components

Major solar energy system components are defined as flat-plate photovoltaic modules,[13] inverters, and meters.

12 *Virtual net metering* allows the electricity produced by a solar energy system installation to be credited to the benefit of multiple tenants in a multifamily building without requiring the solar energy system to be physically connected to each tenant's meter. Virtual net metering was adopted in the California Public Utilities Commission Decision 08-10-036 and modified in Decision 11-07-031 (docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/139683.htm).
13 An arrangement of photovoltaic cells mounted on a rigid flat surface with the cells exposed freely to incoming sunlight. (See https://definedterm.com/flat_plate_photovoltaic_module.)

All major system components must be new and must not have been previously placed in service in any other location or for any other application. **Equipment installed more than six months before submitting an initial reservation application is not eligible.** System components must satisfy the eligibility requirements specified in the most recently approved edition of *Guidelines for California's Solar Electric Incentive Programs (Senate Bill 1)* www.energy.ca.gov/sb1/meetings/index.html. Approved major components will be posted on the Energy Commission's eligible equipment website available at http://www.gosolarcalifornia.ca.gov/equipment/index.php.

The applicant must confirm that the components purchased for a system are eligible when applying for NSHP funding. The Energy Commission will confirm that the equipment identified in a reservation package meets eligibility requirements before a reservation is granted.

Because equipment is regularly added and removed from the eligible equipment list, the Energy Commission recommends the applicant wait for an approved reservation before installation commences. If the applicant begins or completes installation before the Energy Commission has approved the reservation, changes to the eligible equipment may create a situation where significant and costly system modifications are required to comply with program guidelines.

G. Meters

All solar energy systems must be installed with a stand-alone performance meter or an inverter with a built-in performance meter so that the customer can determine the amount of energy produced by the system.

Projects that qualify for virtual net metering (VNM), as adopted by the California Public Utilities Commission (CPUC) in decisions including, but not limited to, Decision 08-10-036 (modified in Decision 11-07-031) are not required to separately net-meter each residential unit that will be allocated electricity from the solar system.

H. System Size

Eligible solar energy systems shall be a minimum size of 1 kW AC (measured after the inverter) and shall be sized so that the amount of electricity produced offsets part or all of the end-use customer's electrical needs at the installation site. Systems 7.5 kW AC or less are considered sized to serve the on-site electric load of the end-use customer. The maximum incentive paid for a system serving a single-family home is limited to the first 7.5 kW AC of the system. See Chapter III for additional information on maximum incentives.

While common areas are not subject to the 7.5 kW AC cap, the Energy Commission may request additional documentation justifying the system size. See Chapter IV, Section G, for additional information on the system size justification for common areas.

I. System Performance

The incentive amount will be based on relative estimated performance of the solar energy system[14], calculated using the Energy Commission's Flexible Installation Calculator (FI Calculator). The relative estimated performance of the system will be the basis for qualifying for a reservation and for determining the final incentive amount.

System installation shall be consistent with the program eligibility requirements and the specifications used to determine relative estimated performance to receive the reserved incentive amount. The final incentive amount is subject to available funds. The characteristics that are addressed by the FI Calculator include shading by any obstruction of the modules and differences in performance due to geographic location.

Third-party field verification will be conducted to assess whether systems have been installed consistent with the characteristics used to determine estimated performance.

J. System Installation

Solar energy systems must be installed in conformance with the manufacturer's specifications and installation instructions; all applicable electrical, fire, and building codes and standards; all utility interconnection requirements; and any local codes and ordinances.

If installed under contract, systems must be installed by an appropriately licensed contractor, in accordance with rules and regulations adopted by the California Contractors State License Board. Installation contractors must have an active A, B, C-10, or a C-46 license.[15] Contractors with roofing-specific licenses may install photovoltaic modules in accordance with limitations of their specific licenses; however, only contractors with licenses mentioned above can make electrical connections. Owner-builders are allowed under the NSHP to install their own systems.[16]

The Energy Commission encourages installation contractors to become certified by the North American Board of Certified Energy Practitioners (NABCEP). See www.nabcep.org for additional information.

K. Warranty Requirements

All solar energy systems must have a minimum 10-year warranty provided in combination by the manufacturer and equipment seller/installer. During the 10-year period, the warranty must protect against:

14 Solar energy systems using flat-plate photovoltaic technology are the only systems eligible to receive NSHP incentives.
15 Contractors State License Board Check a Contractor License Registration (www2.cslb.ca.gov/OnlineServices/CheckLicenseII/CheckLicense.aspx).
16 For information on restrictions placed on owner-builders, contact the Contractors State License Board at (800) 321-CSLB (2752) to obtain a current edition of the *Contractor's License Law and Handbook*.

1) Defects in materials and workmanship.
2) System or component breakdown.
3) Degradation in electrical output of more than 15 percent from the originally rated electrical output.

The warranty must cover the solar generating system, including the flat-plate photovoltaic modules, inverters, and meters, and provide for no-cost repair or replacement of the system or system components, including any associated labor during the warranty period.

L. Energy Efficiency Requirements

This section covers the energy efficiency requirements that eligible new construction must achieve to receive incentives. The specific NSHP energy efficiency requirements depend on the Energy Standards to which the new building is subject.

Each building where a portion of the electrical load is served by the solar energy system shall be subject to the NSHP energy efficiency requirements. NSHP energy efficiency compliance shall be demonstrated for a building as a whole and cannot combine unrelated or detached buildings.

Solar energy systems installed on additions or alterations to existing buildings do not qualify for NSHP incentives except in the case of residential buildings where the energy efficiency requirements are met for the entire structure by using the whole-building compliance approach[17] in the *2016, 2013,* or *2008 Energy Standards*. Meeting the energy efficiency requirements by using the addition alone compliance approach or the existing+addition+alteration compliance approach will not be accepted. For more information, refer to Chapter 9 of the *2016 Title 24, Part 6, Residential Compliance Manual,*[18] Chapter 9 of the *2013 Title 24, Part 6, Residential Compliance Manual,*[19] or Chapter 8 of the *2008 Title 24, Part 6, Residential Compliance Manual.*[20]

Questions concerning energy efficiency requirements should be directed to the Energy Standards Hotline at title24@energy.ca.gov or 1-800-772-3300. Questions concerning HERS documentation delays should be directed to the HERS Provider prior to contacting the Energy Standards Hotline. Additional information can be found on the Building Energy Efficiency Standards Web page at www.energy.ca.gov/title24/.

17 The whole-building approach is defined in Section 8.7.1 of the *2008 Building Energy Efficiency Standards Residential Compliance Manual*, www.energy.ca.gov/2008publications/CEC-400-2008-016/CEC-400-2008-016-CMF-REV1.PDF, and Section 8.5.1 of the *2013 Building Energy Efficiency Standards Residential Compliance Manual,* http://www.energy.ca.gov/2013publications/CEC-400-2013-001/chapters/08_Performance_Method.pdf.
18 http://www.energy.ca.gov/2015publications/CEC-400-2015-032/chapters/chapter_9-Additions_Alterations_and_Repairs.pdf
19 http://www.energy.ca.gov/2013publications/CEC-400-2013-001/chapters/09_Additions_Alterations_and_Repairs.pdf.
20 www.energy.ca.gov/2008publications/CEC-400-2008-016/CEC-400-2008-016-CMF-REV1.PDF.

1. How to Determine Energy Standards

The NSHP energy efficiency requirements are determined by the Energy Standards under which the project was permitted by the building department or local authority having jurisdiction. Applicants may also verify the Energy Standards a project is subject to using the following dates:

- *2016 Building Energy Efficiency Standards (2016 Energy Standards)*: Building permit application(s) submitted to the building department on or after January 1, 2017.
- *2013 Building Energy Efficiency Standards (2013 Energy Standards)*: Application(s) submitted to the building department on or after July 1, 2014, and prior to January 1, 2017.
- *2008 Building Energy Efficiency Standards (2008 Energy Standards)*: Application(s) submitted to the building department on or after January 1, 2010, and prior to July 1, 2014.

2. Requirements for Projects Subject to the *2016 Energy Standards*

Buildings subject to the *2016 Energy Standards* must meet the code-compliant efficiency requirements to participate in NSHP. The code-compliant tier is the only efficiency tier for the *2016 Energy Standards* and requires that the proposed building comply with the *2016 Energy Standards*.

The *2016 Energy Standards* allow solar energy systems to claim a compliance credit when using the performance compliance approach.[21] The PV compliance credit (PV credit) was designed to provide an additional compliance option for builders as an alternative to installing high-performance walls (HPW) and/or high-performance attics (HPA), which are a prescriptive requirement in many climate zones.[22] The magnitude of the PV credit corresponds to the magnitude of the efficiency credit for HPW/HPA, which varies based on the Energy Commission climate zone the project is located in.

The PV credit may be claimed in compliance documentation submitted to the Energy Commission for *2016 Energy Standards* projects applying for the NSHP code-compliant incentive; however, if the credit is claimed, only the portion of the proposed system that exceeds the system size required by the Title 24 compliance software shall be eligible for NSHP incentives.

Compliance with the NSHP code-compliant energy efficiency requirements shall be determined using the performance compliance approach with software approved by the Energy Commission. NSHP applications shall include a copy of the Title 24 compliance documentation (CF-1R or PERF-1) generated using compliance software approved for the *2016 Energy*

21 Refer to Section 2.2.3 of the *2016 Residential Alternative Calculation Method Reference Manual* for additional information on the PV compliance credit.
22 See Appendix B for the prescriptive wall and attic requirements for the *2016 Energy Standards*

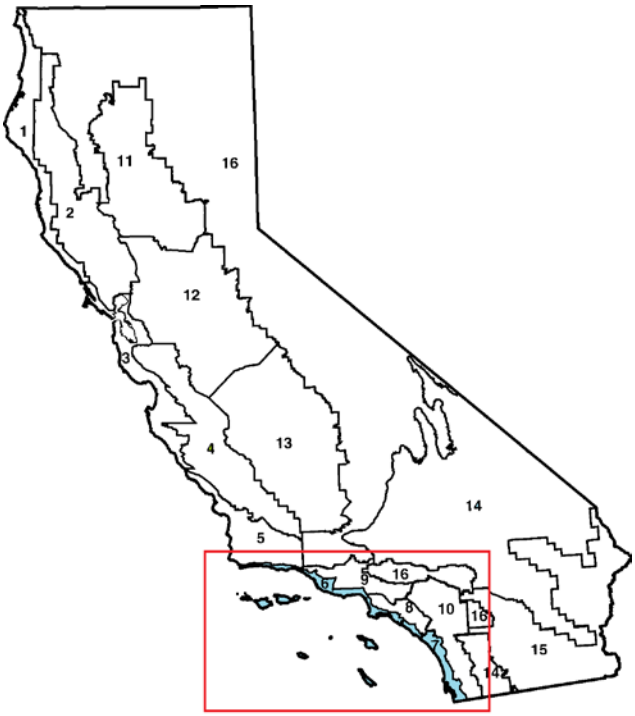
Standards, unless the project is participating in a utility new construction energy efficiency program (See Part 5 in this section).

a. Buildings Ineligible for the PV Credit

The PV credit is available only for low-rise residential buildings (up to three stories), which are modeled on a certificate of compliance (CF-1R). High-rise residential (more than three stories) or nonresidential buildings, which are modeled on a PERF-1, do not have the PV credit available.

Furthermore, the PV credit is available in 14 out of 16 climate zones. Climate Zones 6 and 7 (shown in Figure 2-1) cannot claim the PV credit in the Title 24 compliance documentation. For a list of climate zones by zip code, please refer to http://www.energy.ca.gov/maps/renewable/BuildingClimateZonesByZIPCode.pdf.

Figure 2-1: California Climate Zones



Source: California Energy Commission

b. Buildings Claiming the PV Credit

For buildings that use the PV credit to comply with the *2016 Energy Standards*, the eligible NSHP system size shall be the difference between the proposed system and the system size required to receive the PV credit in the Title 24 modeling software ("compliance size"). This section details how to determine the NSHP compliance system size for buildings that meet the *2016 Energy Standards* using the PV credit; refer to Chapter III, Section D for incentive calculation details for these projects.

When the PV credit is claimed on the CF-1R, the energy use summary will display a negative value under the Proposed Design of the Photovoltaic Offset row (See column six in Figure 2-2). Unless otherwise notified by the applicant, the Energy Commission will assume that any building that claims the PV credit on the CF-1R has used the PV credit to comply with the minimum requirements of the *2016 Energy Standards*.[23]

Figure 2-2: Location of Photovoltaic Offset on *2016 Energy Standards* CF-1R

ENERGY USE SUMMARY				
04	05	06	07	08
Energy Use (kTDV/ft^2-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	22.18	17.75	4.43	20.0%
Space Cooling	5.49	1.79	3.70	67.4%
IAQ Ventilation	1.06	1.06	0.00	0.0%
Water Heating	8.48	8.48	0.00	0.0%
Photovoltaic Offset	----	-8.41	8.41	----
Compliance Energy Total	37.21	20.67	16.54	44.5%

Source: California Energy Commission

The compliance size needed to claim the PV credit for a given building in the Title 24 modeling software depends on multiple factors, including climate zone, conditioned floor area, occupancy (single-family or multifamily), and the standard design of the home. The minimum compliance size is 2 kW DC for a single-family residence and 1 kW DC for a multifamily unit.

i. Compliance Size for Single-Family Homes

Buildings Up to 2,500 Ft^2

For houses with a conditioned floor area less than or equal to 2,500 square feet, a simplified NSHP compliance size shall be determined solely by climate zone. Table 2-1 below identifies the NSHP compliance size (kW DC) for each climate zone.

23 If a building meets the requirements of the *2016 Energy Standards* based on energy efficiency measures alone, but the PV credit was also claimed on the CF-1R, the applicant may notify the Energy Commission that the PV credit was not needed for code-compliance. Refer to Appendix B for details.

Table 2-1: NSHP Compliance Size for Single-Family Homes up to 2,500 Ft^2

Climate Zone	1	2	3	4	5	6	7	8
NSHP Compliance Size (kW DC)	2.1	2.1	2.0	2.1	2.0	n/a	n/a	2.1
Climate Zone	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
NSHP Compliance Size (kW DC)	2.1	2.1	2.2	2.2	2.2	2.2	2.3	2.1

Source: California Energy Commission

Buildings Larger Than 2500 Ft^2

For buildings with a conditioned floor area greater than 2,500 square feet, the NSHP compliance size shall be equivalent to the Title 24 compliance size. The compliance size in kW DC shall be determined based on equations derived from the *2016 Residential Alternative Calculation Method Reference Manual*[24] (ACM). The FI Calculator will calculate the compliance size using the following inputs, which are found on each CF-1R:

- Climate zone
- Conditioned floor area
- Photovoltaic offset[25]

Figures 2-3 and 2-4 show the location of these inputs on a single-family CF-1R.

Figure 2-3: *2016 Energy Standards* Single Family CF-1R General Information

GENERAL INFORMATION					
01	Project Name	CEC Example House			
02	Calculation Description	New Single Family Home			
03	Project Location	123 Main Street			
04	City	Sacramento, CA	05	Standards Version	Compliance 2017
06	Zip Code	12345	07	Compliance Manager Version	BEMCmpMgr 2016.2.0 (592)
08	Climate Zone	CZ12	09	Software Version	CBECC-Res 2016.2.0 (857)
10	Building Type	Single Family	11	Front Orientation (deg/Cardinal)	0
12	Project Scope	Newly Constructed	13	Number of Dwelling Units	1
14	Total Cond. Floor Area (ft^2)	2500	15	Number of Zones	1
16	Slab Area (ft^2)	2500	17	Number of Stories	1
18	Addition Cond. Floor Area	N/A	19	Natural Gas Available	Yes
20	Addition Slab Area (ft^2)	N/A	21	Glazing Percentage (%)	16.0%

Source: California Energy Commission

24 http://www.energy.ca.gov/2015publications/CEC-400-2015-024/CEC-400-2015-024-CMF-REV2.pdf.
25 If the PV credit is claimed in the *2016 Energy Standards*, the photovoltaic offset shall always be a negative number.

Figure 2-4: *2016 Energy Standards* Single-Family CF-1R Energy Use Summary

ENERGY USE SUMMARY				
04	05	06	07	08
Energy Use (kTDV/ft²-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	22.18	17.75	4.43	20.0%
Space Cooling	5.49	1.79	3.70	67.4%
IAQ Ventilation	1.06	1.06	0.00	0.0%
Water Heating	8.48	8.48	0.00	0.0%
Photovoltaic Offset	---	-8.41	8.41	---
Compliance Energy Total	**37.21**	**20.67**	**16.54**	**44.5%**

Source: California Energy Commission

ii. Compliance Size for Multifamily Projects

For low-rise multifamily buildings, the NSHP compliance size shall be equivalent to the Title 24 compliance size. Similar to the process for single-family homes greater than 2,500 square feet, the compliance size in kW DC for all low-rise multifamily buildings shall be determined based on equations derived from the ACM and require the following inputs, which are found on each CF-1R:

- Climate zone
- Conditioned floor area
- Photovoltaic offset[26]
- Number of dwelling units

Figures 2-5 and 2-6 show the location of these inputs on a multifamily CF-1R. Climate zone, conditioned floor area, and number of dwelling units are listed under "General Information"; the photovoltaic offset is listed under the energy use summary.

Figure 2-5: *2016 Energy Standards* Multifamily CF-1R General Information

GENERAL INFORMATION					
01	Project Name	MF with PV Credit			
02	Calculation Description				
03	Project Location	123 Main Street			
04	City	San Jose, CA	05	Standards Version	Compliance 2017
06	Zip Code		07	Compliance Manager Version	BEMCmpMgr 2016.2.0 (592)
08	Climate Zone	CZ4	09	Software Version	CBECC-Res 2016.2.0 (857)
10	Building Type	Multifamily	11	Front Orientation (deg/Cardinal)	0
12	Project Scope	Newly Constructed	13	Number of Dwelling Units	40
14	Total Cond. Floor Area (ft²)	40000	15	Number of Zones	2
16	Slab Area (ft²)	20000	17	Number of Stories	1
18	Addition Cond. Floor Area	N/A	19	Natural Gas Available	Yes
20	Addition Slab Area (ft²)	N/A	21	Glazing Percentage (%)	5.4%

Source: California Energy Commission

26 If the PV credit is claimed in the *2016 Energy Standards*, the photovoltaic offset shall always be a negative number.

Figure 2-6: *2016 Energy Standards* Multifamily CF-1R Energy Use Summary

ENERGY USE SUMMARY				
04	05	06	07	08
Energy Use (kTDV/ft²-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	3.12	3.74	-0.62	-19.9%
Space Cooling	4.43	10.49	-6.06	-136.8%
IAQ Ventilation	2.16	2.16	0.00	0.0%
Water Heating	28.32	23.24	5.08	17.9%
Photovoltaic Offset	---	-4.22	4.22	---
Compliance Energy Total	**38.03**	**35.41**	**2.62**	**6.9%**

Source: California Energy Commission

c. Compliance Documentation Author Requirement

Any person legally authorized to sign 2016 Title 24 compliance documentation may sign the project compliance documentation (CF-1R or PERF-1).[27] The Title 24 compliance documentation submitted to the NSHP should be the same Title 24 compliance documentation that was or will be submitted to the building department to obtain a building permit.

27 Please refer to Chapter 2 of the *2016 Residential Compliance Manual* for additional information about who is legally authorized to sign Title 24 compliance documentation.

3. Requirements for Projects Subject to Previous Updates of the Energy Standards

Buildings that have building permit applications dated when either the *2008 Energy Standards* or the *2013 Energy Standards* were in effect are subject to the requirements below.

a. Buildings Subject to the *2013 Energy Standards*

Buildings subject to the *2013 Energy Standards* must meet one of the following three tiers of energy efficiency):

- Code-compliant: The building must comply with the *2013 Energy Standards* prior to claiming the PV credit for the *2013 Energy Standards*.
- Tier I: For low-rise residential buildings, a total compliance margin of 15 percent better than standard as indicated on the CF-1R. For qualifying high-rise residential buildings, a total compliance margin of 10 percent better than standard as indicated on the Performance Certificate of Compliance (PERF-1).
- Tier II: For low-rise residential buildings, a total compliance margin of 30 percent better than standard as indicated on the CF-1R. For qualifying high-rise residential buildings, a total compliance margin of 15 percent better than standard as indicated on the PERF-1.

Appendix C contains specific information about the efficiency requirements for different eligible building types.

Reservation applications submitted for any of the three tiers shall include a copy of the CF-1R or PERF-1 generated using software approved for the *2013 Energy Standards*, unless the project is participating in a utility new construction energy efficiency program.

Figure 2-7 represents where to find the percent improvement in compliance margin from a sample CF-1R. The exact layout of a CF-1R may vary based on the software version used.

Figure 2-7: Sample *2013 Energy Standards* CF-1R Compliance Margin

ENERGY USE SUMMARY

04	05	06	07	08
Energy Use (kTDV/ft²-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	22.45	17.38	5.07	22.6%
Space Cooling	9.17	2.43	6.74	73.5%
IAQ Ventilation	0.88	0.88	0.00	0.0%
Water Heating	11.98	11.98	0.00	0.0%
Photovoltaic Offset	----	0.00	0.00	----
Compliance Energy Total	44.48	32.67	11.81	26.6%

Source: California Energy Commission

i. Requirements for Code-Compliant Projects

PV Credit: The *2013 Energy Standards* allow solar energy systems to claim a PV credit when using the performance compliance approach.[28] However, buildings applying for the code-compliant incentive must comply with the *2013 Energy Standards* prior to claiming the PV credit of the *2013 Energy Standards*. The Energy Commission will verify this during its review of the reservation application.

Compliance Documentation Author Requirement: For projects applying for the code-compliant incentive, any person legally authorized to sign 2013 Title 24 compliance documentation may sign the project compliance documentation, including the CF-1R.[29] The Title 24 compliance documentation submitted to the NSHP should be the same Title 24 compliance documentation that was or will be submitted to the building department to obtain a building permit.

ii. Requirements for Tier I and Tier II Projects

PV Credit: Projects complying with either the Tier I or Tier II energy efficiency requirements under the *2013 Energy Standards* will be allowed to claim this credit in the Title 24 compliance documentation as part of meeting the *2013 Energy Standards*.

Compliance Documentation Author Requirement: Compliance with the *2013 Energy Standards* Tier I or Tier II energy efficiency requirements shall be determined using the performance compliance approach using software approved by the Energy Commission. A signed CF-1R or PERF-1 must be submitted as part of the reservation application, with the exception of projects participating in a utility new construction program.

A Certified Energy Analyst (CEA) who is approved by the California Association of Building Energy Consultants (CABEC) must sign the compliance documentation. CABEC requires CEAs to have separate certifications for residential and nonresidential standards, as well as separate certifications for each of the different updates of Title 24, Part 6. At the time the compliance documentation is signed, the CEA must have a valid CABEC certification for the *2013 Energy Standards* and the appropriate building type (residential or nonresidential). The CEA can help determine which energy efficiency measures are needed to meet NSHP energy efficiency requirements and prepare the necessary documentation that must be submitted as part of the NSHP application. For a list of CEAs, visit the CABEC website at www.cabec.org.

28 Refer to Section 2.2.3 of the *2013 Residential Alternative Calculation Method Residential Reference Manual* for additional information.
29 Refer to Chapter 2 of the *2013 Title 24, Part 6, Residential Compliance Manual* for additional information about who is legally authorized to sign Title 24 compliance documentation.

d. Buildings Subject to the *2008 Energy Standards*

Buildings subject to the *2008 Energy Standards* are required to meet one of the following two tiers of energy efficiency:

- Tier I: For residential buildings, a total compliance margin of 15 percent better than standard as indicated on the CF-1R. For qualifying nonresidential buildings, a total compliance margin of 15 percent better than standard, as indicated on the PERF-1.
- Tier II: For residential buildings, a total compliance margin of 30 percent better than standard as indicated on the CF-1R and a space-cooling compliance margin of at least 30 percent better than standard. For qualifying nonresidential buildings, a total compliance margin of 30 percent better than standard as indicated on the PERF-1 and a space-cooling compliance margin of at least 30 percent better than standard.

Please see Appendix C for more information about the Tier I and Tier II efficiency requirements for different eligible building types.

i. Compliance Documentation Author Requirements

Compliance with the *2008 Energy Standards* Tier I or Tier II energy efficiency requirements shall be determined using the performance compliance approach using software approved by the Energy Commission. A signed CF-1R or PERF-1 must be submitted as part of the reservation application, with the exception of projects participating in a utility new construction program. A Certified Energy Plans Examiner (CEPE) or a CEA who is approved by CABEC must sign the compliance documentation. CABEC requires CEPEs and CEAs to have separate certifications for residential and nonresidential standards, as well as separate certifications for each of the different updates of Title 24, Part 6. At the time the compliance documentation is signed, the CEPE or CEA must have a valid CABEC certification for the appropriate building type (residential or nonresidential) and for the *2008 Energy Standards*. The CEPE or CEA can help determine which energy efficiency measures are needed to meet NSHP energy efficiency requirements and prepare the necessary documentation that must be submitted as part of the NSHP application. For a list of CEPEs and CEAs, visit the CABEC website at www.cabec.org.

ii. Plan Check

All NSHP projects under the *2008 Energy Standards* will be required to have a NSHP plan check conducted unless the project is participating in a utility new construction energy efficiency program.

4. Energy Efficiency Requirements for Eligible Common Areas

NSHP incentives will not be provided to any solar energy system serving electrical loads in the nonresidential portions of a development, except in cases of mixed-use buildings or the

common areas[30] of single-family residential developments (subdivisions) or multifamily developments.

Solar energy systems serving electrical loads only in the common areas of multifamily developments are eligible for NSHP incentives if the entire multifamily residential building associated with the common area meets the NSHP energy efficiency requirements.

Solar energy systems serving electrical loads only in the common areas of a single-family residential development (subdivision) are eligible for NSHP incentives if all homes in the residential development meet the NSHP energy efficiency requirements. Any additional buildings where electrical loads are served by the solar energy system must also meet the NSHP energy efficiency requirements.

If the solar energy system does not serve any electrical loads in a building or serves electrical loads in a building that does not have any conditioned space,[31] then for multifamily developments, at least one residential building must meet the NSHP energy efficiency requirements. For single-family residential developments (subdivisions), all homes in the residential development must meet the energy efficiency requirements.

5. Utility New Construction Energy Efficiency Program Participation

Applicants are strongly encouraged to participate in their utility's new construction energy efficiency program to obtain the financial incentives that may be available for meeting increased energy efficiency requirements and to streamline NSHP energy efficiency verification.

When a project is participating in both the NSHP program and a utility new construction energy efficiency program, the project shall meet the energy efficiency requirements of the utility new construction program in lieu of the NSHP energy efficiency requirements as long as the Energy Commission determines that the utility new construction energy efficiency requirements are equivalent to or exceed the NSHP energy efficiency requirements. The utility new construction energy efficiency program is meant to provide a separate, alternate path for NSHP energy efficiency compliance.

30 *Common areas* are defined as those nondwelling portions of a building that are intended for the primary benefit of the residential occupants of the building. Examples include, but are not limited to, hallways, laundry rooms, recreation rooms, manager unit, and tenant parking.

31 *Conditioned space* may be directly conditioned or indirectly conditioned. *Directly conditioned space* is an enclosed space that is provided with wood heating, is provided with mechanical heating that has a heating capacity exceeding 10 British thermal unit per hour square foot (Btu/hr-ft²), or is provided with mechanical cooling that has a cooling capacity exceeding 5 Btu/hr-ft², unless the space-conditioning system is designed for a process space. *Indirectly conditioned space* is enclosed space, including, but not limited to, an unconditioned volume in atria of a building, that (1) is not directly conditioned space and (2) either (a) has a thermal transmittance area product (UA) to directly conditioned space exceeding that to the outdoors or to unconditioned space, and does not have fixed vents or openings to the outdoors or to unconditioned space, or (b) is a space through which air from directly conditioned spaces is transferred at a rate exceeding three air changes per hour. See the Section 100.1 – "Definitions and Rules of Construction" in the *2013 Building Energy Efficiency Standards*. www.energy.ca.gov/2012publications/CEC-400-2012-004/CEC-400-2012-004-CMF-REV2.pdf.

For NSHP projects where a utility new construction energy efficiency program approval letter is submitted with the NSHP reservation application or the utility program administrator otherwise confirms the approval, the applicant is not required to provide a copy of the building permit/subdivision map or the Title 24 documentation (CF-1R or PERF-1). Furthermore, projects subject to the *2008 Energy Standards* may bypass the NSHP plan check and submittal of plan check materials, such as the construction plan set and electronic input file.

Table 2-2: Reservation Documents and Processes Waived for Projects Participating in a Utility New Construction Energy Efficiency Program

	2016 Energy Standards Projects	*2013 Energy Standards* Projects	*2008 Energy Standards* Projects
Building Permit or Subdivision Map	Waived	Waived	Waived
CF-1R or PERF-1	Waived	Waived	Waived
Electronic Input File	N/A	N/A	Waived
Construction Plan Set	N/A	N/A	Waived
NSHP Plan Check	N/A	N/A	Waived

Source: California Energy Commission

NSHP projects that have not received a utility new construction energy efficiency program approval letter or cannot provide documentation confirming the NSHP project meets the requirements of the utility new construction energy efficiency program at the time of the Energy Commission review of the NSHP reservation application will have up to 60 calendar days after the Energy Commission reservation application review to provide this documentation.

For NSHP projects where a utility new construction energy efficiency program payment letter is submitted, or the payment is otherwise confirmed by the utility program administrator, the applicant is not required to provide a copy of the Title 24 verification forms (CF-3Rs) and the Additional Energy Features Checklist (NSHP EE-3) or certificate of occupancy.

Table 2-3: Payment Documents Waived for Projects Participating in a Utility New Construction Energy Efficiency Program

	2016 Energy Standards Projects	*2013 Energy Standards* Projects	*2008 Energy Standards* Projects
CF-3R(s)	Waived	Waived	Waived
Additional Energy Features Checklist (NSHP EE-3)	N/A	Waived	Waived

Source: California Energy Commission

Once an NSHP applicant chooses to have the project participate in a utility new construction energy efficiency program, it is expected that the project will successfully complete the utility new construction energy efficiency program. If, for some reason, the project is not able to successfully complete the utility new construction energy efficiency program, then all the NSHP energy efficiency requirements shall be met.

6. Quality Assurance Plan Check

NSHP plan checks are waived for the following project types:

- Projects applying for the code-compliant incentive type.
- Tier I and Tier II projects subject to the *2013 Energy Standards* with compliance documentation completed by a certified 2013 CEA.
- Projects participating in a utility new construction energy efficiency program.

However, the Energy Commission reserves the right to complete a quality assurance plan check for a project that falls into one of the categories listed above, and will request the energy efficiency documentation, including the construction plan set, prior to the plan check. The plan check may occur at any time during the reservation or payment review. The plan check results will be used by the Energy Commission to evaluate projects that are not required to complete a plan check as part of the NSHP reservation review, as listed above. In all cases, a project must meet the NSHP energy efficiency requirements before issuance of an NSHP incentive. For more information, refer to Appendix B, Section C.

7. Multiple Buildings on Same Meter

Any additional buildings where electrical loads are served by the solar energy system must also meet the NSHP energy efficiency requirements. For example, a solar energy system installed on a new home that is connected to the same electric utility meter as a detached guest house, granny unit, or other conditioned accessory building would be eligible for NSHP incentives only if both buildings meet the NSHP energy efficiency requirements, even if the solar energy system is intended only to offset the load of the main residence.

Applicants shall demonstrate compliance through the submittal of a signed CF-1R(s) or PERF-1(s) for the additional conditioned accessory building(s), along with the CF-1R for the new home, in the reservation application. If the conditioned accessory building is new construction, it must be modeled as new construction under the Energy Standards under which it was permitted, and must meet the minimum NSHP energy efficiency requirements for those Energy Standards. If the conditioned accessory structure is existing construction, it must still be modeled as new construction under the same Energy Standards as the new home and meet the same NSHP energy efficiency requirements as the main residence.

Title 24 compliance documentation is not required for accessory structures that contain no conditioned space (for example, an unconditioned shed or detached garage) or have a separate electric meter from the newly constructed main residence and the solar energy system.

CHAPTER III:
Incentive Calculations and Structure

This chapter describes the incentives offered by the NSHP program. **The currently applicable incentive levels, the MW capacity approved for the current incentive level, and the MW under review are available on the NSHP Application Web Tool, www.newsolarhomes.org/WebPages/Public/RebateLevelView.aspx**. The incentive levels are divided into eight steps[32], with each step targeted for a specified amount of MW. Incentives decline over the life of the program as MW targets are reached, with the application process of the program closing when funding is no longer available or the program is mandated to sunset, whichever is earlier. Incentive levels and reserved volume are subject to funding availability.

The NSHP provides incentives through the Flexible Installation (FI) Incentive structure, as determined by the Energy Commission's FI Calculator. Incentives are paid when the local building authority has approved the installed system, and all program requirements have been met.

A. Market-Rate Housing Incentive Structure

The available incentive levels for NSHP residential projects differ depending on the version of the Energy Standards to which a project is subject, as specified in Table 3-1. Common area projects will be eligible only for the minimum incentive level for each version of the Energy Standards: Code-Compliant for the *2016* and *2013 Energy Standards*, and Tier I for the *2008 Energy Standards*.

Table 3-1: Available Incentive Level Tiers by Energy Standards

	Available Incentive Levels		
	Code-Compliant	**Tier I**	**Tier II**
2016 Energy Standards	**X**		
2013 Energy Standards	**X***	**X**	**X**
2008 Energy Standards		**X***	**X**

***This is the only available tier for common area projects**

32 With the Tenth Edition, the incentive structure for both market-rate and affordable housing ends at Level 8. For more information, see Chapter I, Section C.

The actual incentive amount for a particular solar energy system and installation depends on the FI calculation of the expected performance of the system and the applicable incentive level. Incentive levels will decline when the cumulative MW capacity of applications submitted under an incentive level equals the MW reserved volume target specified in Table 3-2.[33]

Table 3-2: FI Incentive Levels and Related Reservation Volumes

Code-Compliant Incentive* (per watt, reference system)	**Tier I Incentive**** (per watt, reference system)	**Tier II Incentive**** (per watt, reference system)	**Reserved Volume Target***** (MW-AC)
$2.25	$2.50	$2.60	55.3
$2.00	$2.25	$2.35	N/A
$1.75	$2.00	$2.25	5
$1.50	$1.75	$2.00	10
$1.25	$1.50	$1.75	15
$1.00	$1.25	$1.50/$1.75****	35
$0.75	$1.00	$1.50	50
$0.50	$0.75	$1.25	197

The rows shaded in the table indicate past incentive levels.
* The code-compliant incentive is available only for projects complying with the *2013 or 2016 Energy Standards*.
**Tier I and Tier II incentives are available only for projects complying with the *2008 or 2013 Energy Standards.*
***Reserved volume target includes reserved affordable housing residential unit volume, discussed later in Chapter III, Section B.
****The Incentive Level 6 rate of $1.75/watt will be available only for Tier II projects complying with the *2013 Energy Standards*. Tier II projects complying with the *2008 Energy Standards* will receive an Incentive Level 6 rate of $1.50/watt.

Source: California Energy Commission

B. Affordable Housing Incentive Structure

NSHP offers a separate incentive structure with a higher dollar-per-watt rate for affordable housing projects. Multifamily affordable housing projects using virtual net metering are eligible for the affordable housing residential dwelling unit or common area incentive for the portion of the solar energy system that is allocated to the respective portion of the development. For multifamily affordable housing projects using virtual net metering, the residential dwelling units must meet the energy efficiency requirements in Chapter II, Section L.

33 However, because the market-rate incentive level is already at level 8, no further drops will occur. The incentive level for affordable housing projects will drop when the cumulative MW capacity of affordable housing residential unit applications submitted and approved under the specific incentive level equals the MW reserved volume target for affordable housing projects.

The following incentive levels apply to eligible affordable housing projects. Eligibility requirements for affordable housing projects can be found in Chapter IV, Section F. The design of the incentive levels and decline structure for affordable housing projects is the same as the design for market-rate housing, as discussed earlier.

Table 3-3: FI Incentive Levels for Affordable Housing Projects

Common Area* and Code-Compliant Dwelling Unit Incentive** (per watt, reference system)	**Tier I and Tier II Dwelling Unit Incentive***** (per watt, reference system)	**Reserved Volume Target** (MW-AC)
$3.25	$3.50	5.5
$2.90	$3.15	N/A
$2.55	$2.90	0.25
$2.20	$2.55	0.5
$1.85	$2.20	0.75
$1.50	$1.85	7
$1.40	$1.75	10
$1.30	$1.65	12

The rows shaded in the table indicate past incentive levels.
* The affordable housing common area incentive is available only for projects complying with the *2016* or *2013 Energy Standards* and meeting additional requirements in Chapter IV, Section F.
** The code-compliant dwelling unit incentive is available only for projects complying with the *2016* or *2013 Energy Standards*.
***The Tier I and Tier II incentive is available only for projects complying with the *2008 and 2013 Energy Standards.*

Source: California Energy Commission

Systems serving the common areas of affordable housing developments where at least 80 percent of the residential units are subject to the conditions of the regulatory agreement will be eligible for the affordable housing incentive rate. If a project does not meet the affordable housing requirements, the common area will instead receive the market-rate incentive. Common areas under the *2008 Energy Standards* are not eligible for this incentive and instead will receive the market-rate incentive.

Multifamily affordable housing projects using virtual net metering are eligible for the affordable housing residential and common area incentives for the respective portions of the solar energy system allocated to each. For multifamily affordable housing projects using virtual net metering, the residential units must meet the energy efficiency requirements in Chapter II, Section L.

C. Flexible Installation Incentive Calculation

The FI incentive is based on the relative estimated performance of the solar energy system as determined through the FI Calculator. The analysis by the FI Calculator takes into account the tested and certified performance of the specific module and inverter, as well as the estimated

impact of climate on the system performance. The estimated effects of geography on the performance of the system are modeled using the Energy Commission's Climate Zones as defined in the *Energy Standards*. The factors were determined using the Time Dependent Valuation (TDV) system and applicable hourly multipliers as defined in the *2016 Energy Standards*.

Table 3-4: Climate Zone Production Factors for FI Incentive Calculation

Climate Zone	Production Factor	Climate Zone	Production Factor
1	89%	9	99%
2	101%	10	100%
3	103%	11	99%
4	103%	12	96%
5	111%	13	96%
6	99%	14	105%
7	102%	15	96%
8	97%	16	104%

Source: California Energy Commission

The FI incentive also takes into account the shading of a solar energy system. Any system that does not meet the minimum shading criteria (Appendix D, Section C.1) must determine the annual solar access of the system and enter it into the FI calculation. For systems that do meet the minimal shading criteria, 100 percent annual solar access will be assumed.[34]

The total FI incentive is calculated as follows:

FI incentive = (PV Module PTC Rating) (Quantity of PV Modules) (Inverter Efficiency) (Adj. Factor) (Incentive Rate)

Adj. Factor = (Climate Zone Production Factor) (Annual Solar Access)

The FI incentive shall be used by, and is available only for, systems with an azimuth between 90 and 280 degrees, inclusive. Any system that does not meet the requirements of the FI incentive will be ineligible for incentives under NSHP.

D. Incentive Calculation for Code-Compliant Projects Using PV to Meet the *2016 Energy Standards*

Buildings subject to the *2016 Energy Standards* may use the PV credit to comply with the *2016 Energy Standards*; however, the portion of the PV system used to claim the PV credit (compliance size) shall not be eligible for incentives (refer to Chapter II, Section L, Part 2). For these projects, the eligible NSHP system size shall be the difference between the proposed

34 For more information on calculating the annual solar access, please refer to Appendix D, Section C.2.

system and compliance size. The following steps describe the determination of the NSHP incentive:

1. Determine the NSHP compliance size (see Chapter II, Section L, Part 2).
2. Convert DC compliance size to kW CEC-AC based on the efficiency of the equipment to be installed.
3. Calculate NSHP eligible system size (kW AC) as the difference between the proposed system and the compliance size.
4. Calculate incentive by multiplying the NSHP eligible system size by the adjustment factor and the incentive described in Section C above.

Or:

$$Incentive = (Proposed\ Size\ [kW\ AC] - Compliance\ Size\ [kW\ AC]) * Adjustment\ Factor * Incentive\ Rate$$

1. Using NSHP-Ineligible Equipment to Offset Compliance Size

As described in Chapter II, Section B, only equipment oriented between 90 and 280 degrees is eligible to receive NSHP incentives. However, equipment installed outside this range ("ineligible equipment") may still be used to offset the NSHP compliance size requirement.

The ineligible system size is calculated using the equipment quantity, PTC rating, and inverter efficiency for the equipment outside the ineligible range. In this case, the steps to determine the eligible NSHP incentive are modified as follows:

1. Determine the NSHP compliance size (refer to Chapter II, Section L, Part 2).
2. Convert DC compliance size to kW CEC-AC based on the efficiency of the proposed equipment to be installed.
3. Calculate the adjusted compliance size by subtracting the ineligible system size from the compliance size.
4. Calculate NSHP eligible system size (kW AC) as the difference between the proposed system and the adjusted compliance size.
5. Calculate incentive by multiplying the NSHP eligible system size by the adjustment factor and the incentive described in Section C above.

Or:

$$Incentive = \big(Proposed\ Size\ [kW\ AC] - (Compliance\ Size\ [kW\ AC] - Ineligble\ Size\ [kW\ AC])\big) * Adjustment\ Factor * Incentive\ Rate$$

2. Virtual Net Energy Metering

For virtual net-energy-metered (VNM) projects, the PV compliance size shall apply only to the portion of the system serving the building occupancy(ies) that received credit for the PV system.

For example, consider a PV system serving both residential units and nonresidential common area load in a multifamily building that used PV to comply with the *2016 Energy Standards*. Because the PV credit applies only to low-rise residential buildings, the eligible system size for the common area and residential portions of the systems would be determined as follows:

$$Eligible\ Common\ Area\ System\ Size = (Common\ Area\ Allocation\ \%) * (Proposed\ System\ Size\ [kW\ AC])$$

$$Eligible\ Residential\ System\ Size = \big((Residential\ Allocation\ \%) * Proposed\ System\ Size[kW\ AC\ ]\big) - Compliance\ Size\ [kW\ AC]$$

The incentive amount shall be calculated by multiplying the eligible system sizes by the adjustment factor and respective incentive rate as described in the previous sections.

E. Incentive for Projects Located in Disadvantaged Communities

The NSHP program offers an additional incentive to applicants with projects located in parts of California that are particularly vulnerable to the effects of pollution and other environmental, economic, and social stressors. Affordable housing projects located within a disadvantaged community, as designated by the California Environmental Protection Agency (CalEPA) are eligible for an additional incentive, calculated as:

Disadvantaged Community Incentive (DCI) = (Incentive from FI Calculator) x 20%

The DCI will be capped at a maximum of $500 per dwelling unit served by the solar energy system. This incentive may be claimed by qualifying affordable housing projects under the affordable housing incentive structure. To be eligible, affordable housing projects must be physically located in a census tract identified by the CalEPA as a Disadvantaged Community.[35] A list of census tracts[36] identified as Disadvantaged Communities can be found at http://www.calepa.ca.gov/EnvJustice/GHGInvest/.

35 *Disadvantaged communities* have been identified by CalEPA as those California census tracts that score in the top 75th percentile of the CalEnviroScreen 2.0. For more information, visit http://www.calepa.ca.gov/EnvJustice/GHGInvest/.
36 To determine the 10-digit census tract number of an affordable housing project's, the physical mailing address of the project can be entered into the U.S. Census Bureau FactFinder website: http://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?ref=addr&refresh=t . Click the information button next to the census tract number to retrieve the entire 10-digit census tract number.

Applicants may be required to provide additional information or documentation to the Energy Commission to demonstrate that the project is within a Disadvantaged Community. For additional information on the information needed, please see Chapter IV, Section F.

F. NSHP Incentive Amount Cap

Incentives for affordable housing projects (residential unit and common areas) will be limited to 75 percent of the total system cost.[37] Incentives for all other projects will be limited to 50 percent of the total system cost. For projects subject to the 7.5 kW AC system size cap referenced in Chapter II, Section H, the incentive will be equal to whichever amount is less. For projects where the incentive has been limited to the first 7.5 kW AC of the system:

- If this project is an affordable housing project and the 7.5 kW AC capped incentive is greater than 75 percent of the total system cost, then the total incentive will be 75 percent of the total system cost.
- If this project is a market-rate housing project and the 7.5 kW AC capped incentive is greater than 50 percent of the total system cost, then the total incentive will be 50 percent of the total system cost.
- If this project is an affordable housing project and the 7.5 kW AC capped incentive is less than 75 percent of the total system cost, then the total incentive will be the 7.5 kW AC capped incentive.
- If this project is a market-rate housing project and the 7.5 kW AC capped incentive is less than 50 percent of the total system cost, then the total incentive will be the 7.5 kW AC capped incentive.

For projects subject to virtual net metering, the system size cap shall be calculated by multiplying 7.5 kW AC by the number of residential dwelling units served by the solar energy system.

37 *Total system cost* consists of the cost of the equipment and materials incurred by the system owner for the solar energy system, including sales tax, labor to install the solar energy system, and costs of solar energy system permits issued by the authority having jurisdiction. All other costs incurred by any party, including financing fees, origination fees, processing fees, or administrative fees, are not considered part of the total system cost. The cost of any equipment used to store the electricity produced by the solar energy system is not considered part of the total system cost. The total amount of incentives or discounts received from a source, other than the sources identified in Chapter III, may be subtracted from the total system cost before applying the incentive amount cap.

G. Change in Incentive Level

The market-rate housing incentive is at Level 8, which is the last incentive level for this structure. There will be no additional level changes for market-rate housing. The affordable housing incentive is at Level 6 and may undergo two level drops.

When the cumulative MW capacity of applications submitted under an incentive level equals the MW reserved volume target for that incentive level, the incentive level will drop to the next incentive level. If the capacity for an application exceeds the remaining capacity in the current incentive level, the reservation for that application will be split between the current incentive level and the next incentive level. **The Energy Commission will not provide notice to program participants of a drop in the incentive levels as shown in the above tables. However, information on the current incentive level, the MW capacity approved for the current incentive level, and the MW under review will be available on the NSHP Application Web Tool, www.newsolarhomes.org/WebPages/Public/RebateLevelView.aspx, to help applicants make an informed decision on program incentives.**

It is the applicant's responsibility to be aware of the current incentive level and the MW capacity remaining in the current incentive level. Projects may be reserved at a lower incentive level than the incentive level in effect at the time the reservation application is submitted, if there has been a drop in the incentive level.

H. Changes to the Incentive After Reservation

1. Changes to System Performance

The California Energy Commission expects a solar energy system to be installed as described in the FI (NSHP FI-1) documentation but recognizes that changes may occur during installation. Any change in the solar energy system specifications or the expected performance of the system as determined through field verification must be documented by rerunning the FI Calculator. If the field verification determines that the FI criteria are not met, the system shall forfeit the reserved NSHP incentive.

The revised incentive amount for a solar energy system will be calculated when the complete payment claim package, including the payment claim form (NSHP-2), and complete documentation supporting changes to the project are submitted to the Energy Commission.

Any additional funding encumbered for a project, as discussed below, is subject to NSHP funding availability and the statutory encumbrance deadline of the program (Chapter I, Section A).

a. Projects With a Single Solar Energy System Site

In the case of projects with a single solar energy system site, when a change in the expected performance of the system results in a decrease in the incentive, the monetary difference between the original estimated incentive amount and the actual incentive amount will be reallocated to the incentive level in effect at the time the complete payment claim package is submitted to the Energy Commission. When a change increases the expected performance of the system, the incremental increase in expected performance will be funded at the incentive level in effect at the time the complete and correct payment claim package, including the NSHP-2 and documents supporting the changes to the system, is submitted to the Energy Commission.

b. Projects With Multiple Solar Energy System Sites

In the case of projects with multiple solar energy system sites, when a change in the expected performance of a system of a site results in a decrease in the incentive for that site, the monetary difference between the original estimated incentive amount for that site and the actual incentive amount will remain as part of the project funding, provided project funding is available.

When a change increases or decreases the expected performance of a system, the total incentive amount shall be funded at the incentive level under which the project was reserved *if original project funding is still available*. The supporting documentation for these changes must be submitted to the Energy Commission with the NSHP-2.

Projects with multiple solar energy system sites that do not have enough original project funding remaining to fund the incentive payment for a site, including an increase, decrease, or no change to expected performance of a system, must first submit a complete payment claim package, including supporting documentation for any change, to the Energy Commission to request additional reservation funding above the original reservation funding amount. The total incentive amount will be funded at the incentive level in effect at the time the complete payment claim package is submitted to the Energy Commission. This also applies to sites requesting final payment that previously received an initial partial payment.

The Energy Commission will evaluate whenever there is insufficient funding to pay the last site of a multisite project at the reserved incentive level. In these cases, the site may be paid the balance of funding remaining in the project. Split incentive levels shall not be paid for projects with multiple solar energy system sites.

2. Adding Solar Energy System Sites to an Existing Reservation

An applicant may add additional solar energy system sites to a project with a valid, unexpired reservation. A project for which all solar energy system sites have received an approved

payment claim is considered to have finished the NSHP program and will no longer have a valid reservation. The applicant must notify the Energy Commission of this request and provide the relevant supporting documentation described in Chapter IV for the additional solar energy system sites prior to the project finishing the NSHP program and/or the reservation expiration.

The additional solar energy system sites will be subject to the program eligibility requirements of the *NSHP Guidebook* edition under which the existing project is reserved. However, the incentive for the additional solar energy system sites will be calculated at the incentive level in effect at the time the request and supporting documentation are submitted to the Energy Commission. The additional solar energy system sites will be subject to the reservation expiration date of the existing project. No additional funding shall be encumbered for the added solar energy system sites.

I. Non-NSHP Incentives

Incentives received from sources other than the NSHP that lower the cost of the solar energy system may affect the incentive amount applicants receive from the Energy Commission. If incentives are from other utility incentive programs, a State of California-sponsored incentive program, or a federal government-sponsored incentive program (other than tax credits), a minimum of 5 percent of the total incentives received or expected from other sources will be subtracted from the NSHP incentive amount. The percentage reduction will be increased as necessary to ensure the sum of all incentives received or expected from all sources, including the NSHP, does not exceed the total cost of the system.

The NSHP will not issue a reservation or make a payment for any system or portion of a system that has received payment from, or is eligible for and participating in, the California Public Utilities Commission-approved California Solar Initiative program or any other incentive program for solar energy systems using investor-owned electric utility ratepayer funds.

CHAPTER IV:
Reservation Process

This chapter discusses the NSHP participation process, including participation benchmarks for applicants, submitting an application through the online Web tool, different project types, and the required forms and documentation.

A list of the required documentation for a reservation application usually includes:

- Reservation Application Form (NSHP-1).
- Building permit or subdivision map.
- Flexible Installation Incentive Calculation (NSHP FI-1).
- Energy efficiency documentation (CF-1R or PERF-1).
- Installation contract.
- NSHP Incentive Disclosure Affidavit.
- Payee Data Record (STD-204)

Additional documentation may be required depending on the project type:

- Construction plan-set
- Regulatory agreement
- System size justification
- NSHP Established Installer Reservation Form[38]

Please read the following descriptions carefully to navigate the NSHP process more easily and determine the necessary documentation required for your project type. Once the required information has been submitted and confirmed to meet the requirements of the NSHP, the reservation application will be approved, and funding will be reserved for the project.

A. NSHP Application Process

The NSHP application process is straightforward.

A. Design your home and the energy efficiency measures. Find a solar contractor to design a PV system for the home. Obtain a building permit and apply for the solar permit through the building department.

B. Create an account through the NSHP Online Web Tool Application at www.newsolarhomes.org. With this tool, the applicant can submit the reservation application and supporting documents to the Energy Commission and keep track of the

38 Applies only to Established Installer applicants with systems that are third-party financed. Please refer to Section E for form details.

application status. Energy Commission review of the application will result in one of the following:

1. The application is deemed complete and eligible and is approved for a reservation (Length of reservation period is determined by project type).
2. The application contains minor errors that must be addressed to receive a reservation approval. Energy Commission staff will send a corrections letter that the applicant will have 15 business days to address. If all corrections are addressed within the allotted correction period, the application will be approved.
3. The application is deemed incomplete or ineligible, and the Energy Commission will disapprove the application. The applicant may reapply to the program if his or her project is eligible.

C. After the reservation is approved, the PV system and energy efficiency measures can be altered as long as the project still meets the NSHP eligibility requirements.

D. The PV system and energy efficiency measures are verified and tested by a certified HERS Rater, and the results are uploaded to a HERS Provider Registry approved by the Energy Commission

E. The building department signs off on the solar permit and issues a certificate of occupancy.

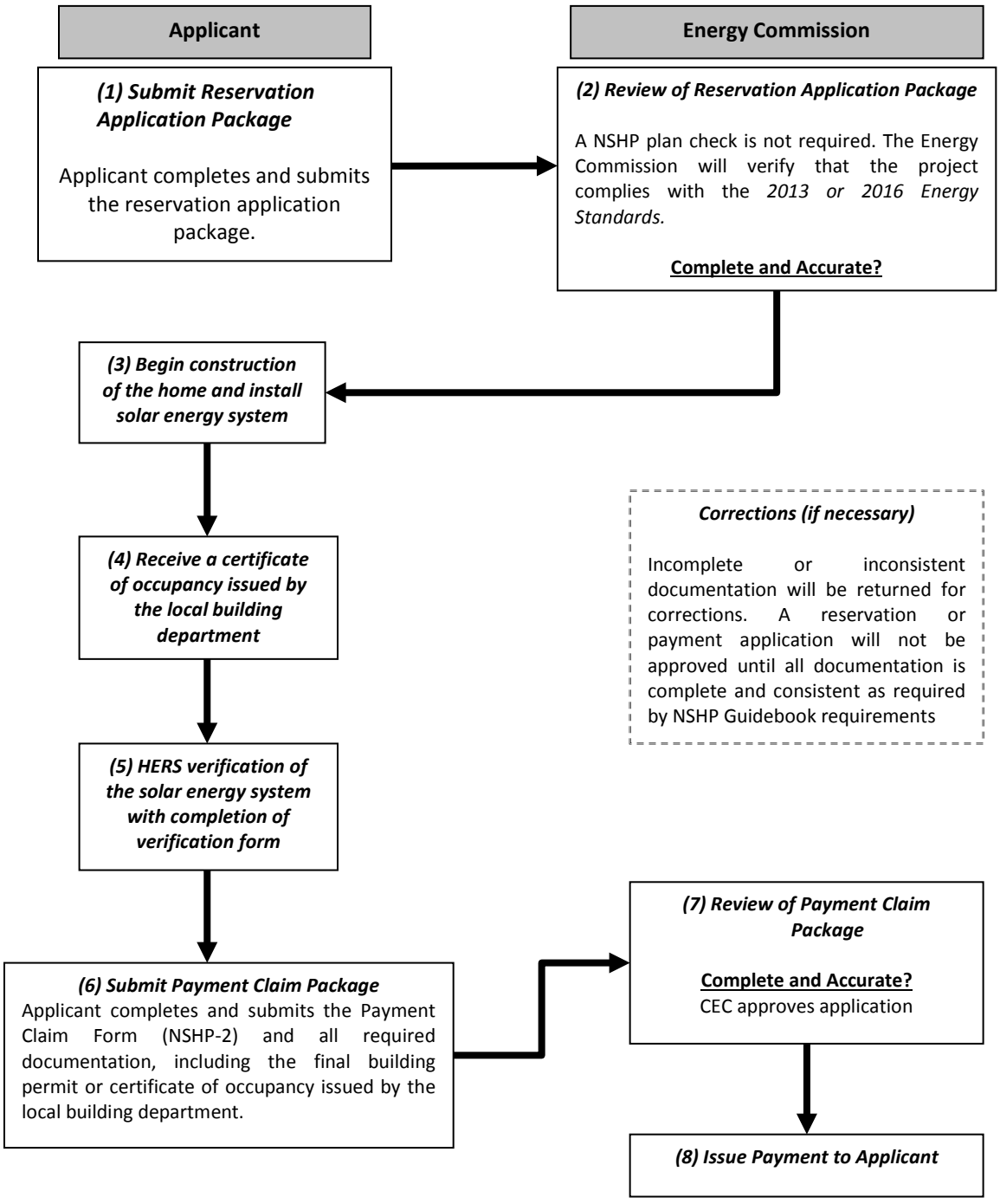
F. Applicant applies to his or her utility for interconnection of the PV system and receives a permission to operate letter.

G. The applicant submits his or her payment claim form, as well as other required supporting documentation, via the NSHP Online Web Tool Application. The payment claim form must contain a wet signature and be mailed into the Energy Commission on or before the reservation expiration date, or the application may be denied, and the applicant may be asked to reapply.

H. The Energy Commission will review the payment claim. If the payment claim is deemed complete, it is approved, and a check with the full incentive amount will be mailed to the designated payee. If the payment claim contains minor errors, Energy Commission staff will send a corrections letter listing the errors that must be addressed to receive payment.

Steps B and G in the NSHP process are steps where the applicant must submit specific documents to the Energy Commission. The documents are explained in Section E below in detail.

Figure 4-1: Application Process Flow Chart for NSHP Code-Compliant Projects



Source: California Energy Commission

B. NSHP Application Web Tool

Complete reservation applications will be reviewed in the order in which they are submitted to the Energy Commission. To ensure timely receipt of an application, it is recommended that applications be submitted electronically via the NSHP Application Web Tool, (www.newsolarhomes.org). Applications submitted via the NSHP Application Web Tool will be given priority over mailed-in applications received on the same date.

At this time, the NSHP Application Web Tool does not allow electronic signatures on NSHP forms. The Energy Commission may later deem electronic signatures allowable on NSHP forms. Applicants will be informed of these changes by a red banner on the login page of the NSHP Application Web Tool.

Please read the following descriptions carefully to determine the reservation period for which the project may qualify and the necessary documentation. Once the required information has been submitted and confirmed to meet the requirements of the NSHP, the reservation application will be approved, and funding will be reserved for the project.

C. Established Installer Designation

The *NSHP Guidebook, Tenth Edition*, introduces the Established Installer designation to high-volume applicants with proven success in applying to the NSHP program. The purpose is to streamline the application process and reduce administrative burdens associated with large developments. Upon receiving this designation, the applicant or applicant's authorized representative(s) may provide attestation documentation in lieu of normal application documentation requirements, as specified in the documentation description below.

To receive the Established Installer designation, an installer must submit a written request to the Energy Commission and meet all of the following conditions:

- The installer must have at least 12 months of NSHP program participation, measured from the approval date of the installer's first approved NSHP reservation application for a solar as standard or solar not as standard project before requesting this designation.

- The installer must have completed system installations for at least 300 approved payment claim applications in the solar as standard or solar not as standard project type across at least five different approved NSHP reservations.

The Established Installer designation shall allow installers to complete and submit the Established Installer Reservation Form and Field Verification Affidavit (FI-2E) form in lieu of the submission of a lease or PPA and NSHP FI-2, respectively. This applies only for systems in solar as standard or solar not as a standard projects. Please refer to Section E for more information

on the NSHP Established Installer Reservation Form. Please refer to Chapter V, Section A for more information on the Field Verification Affidavit (FI-2E) form.

The Established Installer designation is granted at the discretion of the Energy Commission and program administrators shall periodically assess the standing of the installer with NSHP program requirements. The Energy Commission reserves the right to revoke the Established Installer designation at its discretion at any time. Moreover, the Energy Commission reserves the right to revise these requirements in the future.

D. Types of Reservations

Projects will receive an 18-month or 36-month reservation, depending on the project type.

1. 36-Month Reservation

The following projects are eligible for a 36-month reservation period:

- Solar as Standard: Developments/buildout phases[39] of six or more residential units where the builder/developer has committed to installing solar energy systems on 50 percent or more of the dwelling units. This project type includes single-family and multifamily projects. Please see Chapter IV, Section H, for additional information.
- Affordable Housing Projects: These projects include affordable housing residential unit projects and affordable housing common area projects. Please see Chapter IV, Section F, for additional information.
- Virtual-Net-Metered Projects: These projects include affordable housing and market-rate housing projects. Please see Chapter IV, Section F, for additional information.

2. 18-Month Reservation

The following projects are eligible for an 18-month reservation period:

- Custom Homes: Projects consisting of a single residence
- Small Developments: Developments with fewer than six residential units
- Solar Not as a Standard: Projects where solar will be installed on less than 50 percent of the residential units
- Common Areas: Nonresidential portions of market-rate residential developments

E. Forms and Documentation

The documentation described below is required for a complete reservation application.

39 A *buildout phase* is part or all of a development that an applicant plans to build within the reservation period.

1. Reservation Application Form (NSHP-1)

The reservation application form (NSHP-1) provides general information about the proposed project and the electric utility service area in which the project will be located, and requires an estimate of the NSHP incentive based on the FI Calculator (Chapter III, Section C). The homeowner or builder/developer must sign the NSHP-1, or the entire reservation application will be considered incomplete. This form can be found at the end of this guidebook or downloaded from the NSHP Web Tool.

The NSHP-1 provides the homeowner or builder/developer an opportunity to assign his/her administrative rights.

2. Proof of Newly Constructed Residential Building

Applicants must submit either a copy of the approved tentative[40] or final subdivision map or building permits for newly constructed buildings. Grading permits and expired permits are not acceptable and may not be submitted to support an application.

Total rehabilitations of residential units must provide adequate proof that the entire unit(s) are to be renovated and will meet or exceed the energy efficiency requirements for the entire structure.

3. Flexible Installation Incentive Documentation

The Flexible Installation (FI) incentive documentation specifies the eligible funding amount to the applicant. To complete this documentation, the applicant must use the FI Calculator for each solar energy system with different equipment and in different climate zones. Refer to Chapter III for a discussion of the FI Calculation. The FI Calculator will produce the NSHP FI-1 compliance form and .huf digital input file. Both the NSHP FI-1 and the .huf digital input file must be submitted to the Energy Commission for review. The .huf digital input file shall be uploaded into the HERS Provider Data Registry of an Energy Commission-approved NSHP HERS Provider.[41]

4. Energy Efficiency Documentation (CF-1R or PERF-1)

To participate in the NSHP, buildings associated with the solar energy system(s) must be highly energy-efficient. Compliance documentation (CF-1R or PERF-1) run using the *2016 Energy Standards* compliance software or *2013 Energy Standards* compliance software (depending on

40 A *tentative map* is an initial map setting forth in detail a proposed land subdivision that must comply with a city's or county's subdivision and zoning regulations and the state Subdivision Map Act. Under the Subdivision Map Act, an approved tentative map (barring any substantial changes in the interim) virtually guarantees approval of the final map

41 HERS Providers that provide services for NSHP applicants must be approved by the Energy Commission to be HERS Providers for the Energy Standards. See Appendix A for more information on the HERS Provider approval process.

the Energy Standards under which the project was permitted) is required for the code-compliant incentive level. The compliance documentation submitted to the NSHP should be the same compliance documentation that is submitted to the building department to obtain a building permit. Documentation showing efficiency levels that exceed the Energy Standards in effect at the time the building permit was applied for by at least 15 and 30 percent is required for the Tier I and Tier II incentives, respectively. Refer to Chapter II, Section L and Appendix C for the complete energy efficiency requirements for different project types. All projects must provide documentation that appliances provided by the builder are ENERGY STAR®-labeled if ENERGY STAR applies to that appliance. Solar water heating may be used to assist in meeting the energy efficiency requirements for any of the three incentive levels (code-compliant, Tier I, and Tier II).

Applicants of all projects must submit a CF-1R (or PERF-1, when applicable). Applicants of Tier I and Tier II projects subject to the *2008 Energy Standards* must also submit the digital input files associated with the CF-1R or PERF-1, as well as a copy of the construction plan set. If the project is participating in a utility new construction energy efficiency program, the CF-1R and input files are not required. **Applicants are strongly encouraged to participate in their utility's new construction energy efficiency program to obtain the financial incentives that may be available for meeting increased efficiency requirements and to streamline the NSHP energy efficiency verification. Please see Chapter II, Section L for additional information.**

For solar as standard or solar not as standard projects that include plans taking the PV credit, applicants must provide a self-reported list identifying the CF-1R plan to be used with each address. In the event that these details are not yet finalized, the report may identify the anticipated number of lots associated with each plan. Please refer to Chapter II, Section L for more information on the PV credit in CF-1R plans.

For affordable housing projects, projects requesting funding from the California Tax Credit Allocation Committee (TCAC) are given up to 60 days after the approval from TCAC to provide finalized energy efficiency documentation.

5. Installation Contract

The installation contract indicates the applicant's commitment to installing solar energy systems. The applicant must submit an installation agreement for all the residential units in the reservation.

An installation contract must specify the price charged for the installation of equipment for all the residential dwelling units in the reservation. Installation contracts must comply with the CSLB requirements. In general, proper contracts will contain:

- Name, address, and contractor's license number of the company performing the system installation.

- Site address for the system installation (single site project) or total number of residential units (multisite projects) that will have a solar energy system installed.
- Description of the work to be performed.
- Quantity, make, and specific model of the photovoltaic modules, inverters, and meters to be installed at each address. If an incomplete model number is listed, the Energy Commission will assume the lowest efficiency model number will be installed.
- Total agreed price to install the system.
- Printed names and signatures of the applicant or the applicant's representative and the installation company's authorized representative.

For more information on CSLB guidelines, please refer to the website at www.cslb.ca.gov/.

A master equipment purchase and installation agreement for all the residential units in the reservation may be submitted.

For systems that are self-installed, instead of providing an installation contract, applicants must provide an equipment purchase agreement. In cases where there is no signed purchase agreement, the applicant may provide invoices or receipts showing that at least 10 percent of the system equipment purchase price (photovoltaic modules, inverters, and performance meter[s]) or $1,000 per residential unit has been paid to the seller(s).

Leases or PPAs may be submitted with reservation applications in lieu of an installation contract if the leases or PPAs meet all of the above requirements. Leases or PPAs may specify total lease payments in lieu of total agreed price to install the system if the lessor submits documentation of its total purchase and installation costs. See Chapter VI, Section A, for additional lease requirements required during the payment claim stage.

6. NSHP Incentive Disclosure Affidavit

If the payee that is designated to receive the NSHP incentive is not the end-use customer, an incentive disclosure affidavit must be submitted. The affidavit assures that the NSHP rebate is used to reduce the end-use customer's payment(s) for the PV system, and states that the payee will disclose the final incentive amount to the end-use customer upon payment approval. For affordable housing projects, the affidavit assures that the property owner realizes a benefit from the NSHP incentive, where the property owner is the owner of the affordable housing residential unit(s). The Energy Commission reserves the right to require proof that the payee has communicated the final incentive amount to the end-use customer or property owner in writing.

7. NSHP Established Installer Reservation Form

For solar as standard or solar not as standard projects in which the installer is an approved Established Installer, an NSHP Established Installer Reservation Form[42] may be submitted on behalf of any and all sites within the reservation application that are third-party financed. This form is submitted in lieu of a lease or PPA. The form is an affidavit that ensures the inclusion of specific program requirements in the legally executed lease or PPA for the purpose of consumer protection in accordance with program goals. The Energy Commission reserves the right to request a copy of the executed agreement. Please see Section C of this chapter for more information on the Established Installer designation.

8. Payee Data Record (STD-204)

The designated payee identified on the NSHP-1 Reservation Application Form must complete the Payee Data Record (STD-204). If the designated payee has already submitted a complete STD-204 form with a prior application and has received an incentive payment within the past year from the Energy Commission, a new STD-204 is not needed. In these cases, the Energy Commission will use data from the previously submitted STD-204 form. If the data provided in a previously submitted STD-204 have changed, the designated payee must submit a new STD-204. The STD-204 is available at www.gosolarcalifornia.ca.gov/documents/STD-204.pdf.

When the payee is a corporation or limited liability entity, the payee must also submit proof of good standing with the California Secretary of State. If the designated payee is reassigned on the NSHP-2, a STD-204 for the new designated payee must be submitted if not already on record with the Energy Commission.

F. Additional Requirements for Affordable Housing Projects

The NSHP offers higher incentives for qualifying solar energy systems installed on affordable housing residential unit and common area projects.

Affordable housing residential and common area projects of all sizes are eligible for a 36-month reservation period. To qualify, at least 20 percent of the dwelling units in the project must be reserved for extremely low-, very low-, lower-, or moderate-income households for at least 10 years. Additionally, eligible affordable housing common area projects must serve 1) either the office and residential unit of the manager, or 2) areas of the project that are primarily for the benefit of the tenants, such as hallways, recreation rooms, and tenant parking.

Portions of an affordable housing project may qualify for higher incentives by meeting additional requirements. For a system serving affordable housing residential units, only the

42 Only applies to large development/solar as standard/solar not as standard project types where the installer is an approved Established Installer. See Section C for more information.

portion of the system serving dwelling units with income restrictions on the tenants will receive the higher incentive rate. Portions of the system serving units not subject to the affordability requirements will instead receive the market-rate incentive.

Systems serving affordable housing common areas may also receive the higher incentive rate, provided that 80 percent or more of the residential units of the project are reserved for extremely low-, very low-, lower-, or moderate-income households (exempt of the manager's unit).

1. Regulatory Agreement

The affordable housing project must be undertaken following Section 50052.5, 50053, or 50199.4 of the Health and Safety Code or other affordable housing laws or regulations adopted by the California Department of Housing and Community Development. An applicant must provide documentation that demonstrates the statutory basis under which the project was undertaken. In addition, the applicant must provide a copy of the regulatory agreement or approval for the development of the project that identifies 1) the project, 2) the number of residential units in the project subject to the affordability requirements, and 3) the applicable affordability requirements for these residential units. The regulatory agreement or approval must expressly limit residency in the affordable residential units to persons with extremely low, very low, lower, or moderate income as defined by the Health and Safety Code Sections 50079.5, 50105, 50106, and 50093 et seq. or regulations adopted by the California Department of Housing and Community Development. The regulatory agreement shall reserve at least 20 percent of the project units for extremely low-, very low-, lower-, or moderate-income households for at least 10 years. The regulatory agreement must be with a housing agency qualified to enter into the agreement, such as:

- Tax Credit Allocation Committee (TCAC).
- California Debt Limit Allocation Committee (CDLAC).
- California Department of Housing and Community Development/California Housing Finance Agency (HCD/CalHFA).
- U.S. Department of Housing and Urban Development (HUD).
- Redevelopment agency (RDA) or RDA successor agency.
- Housing authority.
- City or county in the case of a project funded by the HUD HOME Investment Partnerships Program.

Examples of an approval for the development of the project include a Section 8 or similar project-based rental assistance contract between the property owner and HUD, or the property owner and a contract agency or public agency; a project-based voucher contract between a property owner and a public housing authority; and an annual contributions contract between HUD and a public housing authority.

The Energy Commission may consult with the agency identified on the regulatory agreement or approval document to confirm that the project is in good standing.

2. Individual Meter Requirement

Each residential dwelling unit for which a solar energy system is being installed must have an electricity consumption meter capable of monitoring and reporting the utility electricity consumption of that unit. The solar energy system for each residential unit shall be separately net-metered through that electricity consumption meter. Meters supplied by an entity other than a utility must be utility-grade and have the same reporting accuracy levels of utility-supplied meters.

EXCEPTION: Projects that qualify for virtual net metering (VNM), as adopted by the California Public Utilities Commission (CPUC) in decisions including but not limited to Decision 08-10-036 that was modified in Decision 11-07-031, are not required to separately net-meter each residential unit that will be allocated electricity from the solar system.

3. Maintenance and Monitoring Plan

Affordable housing applicants shall develop a maintenance and monitoring plan for NSHP-funded systems and shall retain a copy of such plan for inspection by the Energy Commission. This plan shall be provided to the system owner and the building or property manager and shall identify specific maintenance, monitoring, and inspections the building or property manager will need to undertake, or have contracted for, to ensure that the system produces maximum output over the expected life of the system. The plan should include activities such as:

- Scheduled cleaning for the removal of any dirt and dust buildup on the solar energy system.
- Periodic checking of all electrical connections for corrosion and looseness.
- Checking the inverter for instantaneous power and long-term energy output and diagnosing and taking corrective action needed if production is significantly lower than expected.
- Checking for any tree/plant growth or other obstructions that are causing shading on the array and take action to eliminate that shading.

The Energy Commission reserves the right to request applicants to provide a copy of the maintenance and monitoring plan at any time during the NSHP.

4. Projects in Disadvantaged Communities

The NSHP program offers an additional incentive to applicants with qualifying affordable housing projects located in communities identified as disadvantaged by CalEnviroScreen. To request additional funding for these projects, applicants shall:

- Indicate on the NSHP-1 that the project is in a disadvantaged community.
- Identify the census tract number in which the project is located *or* provide a copy of the CalEnviroScreen score for the project from http://oehha.ca.gov/calenviroscreen/report/calenviroscreen-version-20.

Applicants may be required to provide additional information or documentation to the Energy Commission to demonstrate that the project is within a disadvantaged community prior to payment.

G. System Size Justifications for Common Area Systems

For common areas that exceed 7.5 kW AC, applicants will be asked to submit a system size justification with the reservation application. The applicant will submit either a letter or calculations that contain the expected annual kWh usage of the common area. The letter or calculations must be completed and signed by one of the following:

- Certified Energy Analyst
- Professional engineer
- Architect
- C-10 licensed electrical contractor

If the expected production of the solar system exceeds the expected annual electrical load of the common area, the incentive will be limited. NSHP will provide incentives for only the portion of the system serving 100 percent expected annual electrical load of the common area.

H. Additional Information for All Reservation Applications

1. Project-Level Funding

The estimated incentive amount for each solar energy system site identified within a reservation application package will be determined using the FI Calculator. The funds reserved for a project will be the sum of those estimated incentive amounts. However, the reserved funding for projects with multiple system sites will be reserved at the project level, not the site level. Once the solar energy system has been installed and the payment claim package submitted, the incentive for the solar energy system will come from the overall project funding. If a solar energy system site uses more or less funding than originally estimated by the FI Calculator, that funding difference will be reflected in the overall project funding.

Funds reserved for projects with solar energy systems not installed within the allowed reservation period will be reallocated to the incentive level in effect at the time those approved reservations are expired or cancelled, and the reserved volume targets from that point forward will be adjusted to reflect the funds from the expired or cancelled reservations.

2. Funding Availability

Funding is available on a first-come, first-served basis until available program funds are exhausted, and funding is subject to any waiting list criteria established by the Energy Commission for applicants who submit complete and accurate applications. Complete applications will be reviewed in the order in which they are submitted to the Energy Commission. To ensure timely receipt of an application, it is recommended that applications be submitted electronically via the NSHP Application Web Tool, located at www.newsolarhomes.org. Applications submitted via the NSHP Application Web Tool will be given priority over mailed-in applications received on the same date. Only one reservation and one incentive payment will be allowed for each residential unit during the reservation period. Applicants will not be allowed to submit multiple reservation applications for the same residential unit.

The submittal date for applications received by mail is the date the application is received by the Energy Commission. The program criteria applicable on the date the application was submitted will apply. However, the incentive level reserved shall be based on the date the reservation application is submitted to the Energy Commission. Because a drop in the incentive level may occur without notice, projects may be reserved at a lower incentive level than the incentive level initially in effect on the date the reservation application is submitted. **Applicants are strongly encouraged to keep copies of all applications and supporting documentation submitted to the Energy Commission.**

Because program funding will decrease over the term of the program and ultimately exhausted, the Energy Commission recommends that applicants not start construction on residential buildings and system installations until they receive a reservation confirming the availability and amount of funding approved for their application. The Energy Commission intends to provide regular updates on program funding through the Go Solar California website at www.gosolarcalifornia.org/about/nshp.php. Applicants are encouraged to check the Go Solar California website to determine available funding before applying for reservations.

Once program funding is exhausted, the Energy Commission may suspend the NSHP and/or establish a waiting list for complete applications that are not funded. Applications on a waiting list may be funded if additional program funding becomes available. The Energy Commission may establish additional conditions for applications on the waiting list, including, but not

limited to, conditions that limit the total dollar amount of applications on the waiting list and the duration applications may remain on the waiting list.[43]

3. Application Errors

Only applicants who submit complete and accurate reservation applications and provide all supporting documentation will receive reservation approval. For complete reservation applications found to have only minor errors or discrepancies during the reservation review, the Energy Commission will request clarification of information. If the additional information is not supplied within 15 business days, the applicant may be required to reapply.

While information sent in after the initial application may be matched to the application, it is not guaranteed.

Information provided in the application and supporting documentation must be consistent throughout. Applicants should ensure all names, addresses, and equipment are the same throughout all documentation or provide an explanation if they are different. Failure to do so may result in delays or application rejection.

4. Incomplete Applications

No funding will be reserved if an application is incomplete or illegible, has conflicting information, or does not otherwise comply with the program requirements. Incomplete applications will not be approved, and the applicant will be required to reapply to participate in NSHP. Examples of incomplete applications include, but are not limited to, the following:

- The NSHP-1 (Reservation Application Form) was not signed.
- The required document(s), such as an installation contract, were not submitted.
- The building department has not yet issued the building permit for the new home.

5. Reapply Process

If an applicant reapplies, the complete reservation application and all supporting documentation must be submitted as one package and will be subject to the program requirements (as determined by the current edition of the *NSHP Guidebook*), incentive level, and funding availability in effect at the time of reapplication.

If the reservation application was submitted online through the NSHP Application Web Tool, the "Re-Apply" button may be used to copy attachments and information to a new project from the

43 On November 16, 2011, the Energy Commission established waiting list criteria for the NSHP. These criteria are described in a November 4, 2011, notice, which is available at www.energy.ca.gov/renewables/06-NSHP-1/notices/2011-11-04_NSHP_Waiting_List_Notice.pdf.

disapproved application. Not all forms may be copied, so it is the applicant's responsibility to ensure the reapplication is complete and correct.

The applicant should ensure that all errors identified by the Energy Commission in correction or disapproval letter(s) are addressed prior to submitting the reapplication to avoid delays in processing time and the risk of application disapproval.

6. Where to Send Reservations

Applicants are strongly encouraged to send applications electronically through the NSHP Application Web Tool (www.newsolarhomes.org). Please visit the Go Solar California website for tutorials on how to use and navigate the NSHP Application Web Tool before submitting applications electronically.

Alternatively, the complete reservation application may be delivered to the Energy Commission. For mailing address, fax and contact information, please visit www.gosolarcalifornia.ca.gov/contacts/consumers.php.

7. Reservation Transfers

Applicants wishing to use a different equipment seller/installer from the equipment seller/installer selected in their reservation application must notify the Energy Commission and provide supporting documentation verifying this change. The supporting documentation consists of:

- A new NSHP-1.
- An installation contract.
- An equipment purchase agreement (for self-installs).
- A revised NSHP FI-1.

If the original equipment seller/installer is the rebate payee, as indicated on the NSHP-1, he or she must provide written confirmation acknowledging that he or she is no longer the equipment seller/installer for the specific project and will no longer receive the NSHP incentive.

Before approving the change in equipment seller/installer, the Energy Commission will verify that the new equipment seller/installer meets the program eligibility requirements outlined in Chapter II, Section J, and the supporting documentation meets the document requirements outlined in Chapter IV, Section E.

8. Reservation Funding Decrease Schedule

For projects where the builder/developer has committed to installing solar on 50 percent or more of the dwelling units, the Energy Commission will evaluate the progress of the project beginning 12 months after the project is approved for an NSHP reservation and at subsequent

6-month intervals. This evaluation will consider the number of payment claims that have been submitted and the number of residential units indicated to have solar in the reservation application. If the Energy Commission concludes that the project is not progressing as expected, the funding reservation of the project may be reduced or completely disencumbered, according to the following schedule:

- Twelve months after the project reservation is approved, if the sum of the incentive amounts for sites with submitted incentive payment claim forms (NSHP-2) and PV field verification and diagnostic testing forms (NSHP FI-3) totals less than 15 percent of the original project funding amount, the remaining project funding may be reduced up to a level equal to 85 percent of the original project funding amount.
- Eighteen months after the project reservation is approved, if the sum of the incentive amounts for sites with submitted incentive payment claim forms and PV field verification and diagnostic testing forms totals less than 35 percent of the original project funding amount, the remaining project funding may be reduced up to a level equal to 65 percent of the original project funding amount.
- Twenty-four months after the project reservation is approved, if the sum of the incentive amounts for sites with submitted incentive payment claim forms and PV field verification and diagnostic testing forms totals less than 55 percent of the original project funding amount, the remaining project funding may be reduced up to a level equal to 45 percent of the original project funding amount.
- Thirty months after the project reservation is approved, if the sum of the incentive amounts for sites with submitted incentive payment claim forms and PV field verification and diagnostic testing forms totals less than 75 percent of the original project funding amount, the remaining project funding may be reduced up to a level equal to 25 percent of the original project funding amount.

9. Reservation Cancellations

Only the applicant or the applicant's authorized representative may cancel project reservations. Applicants wishing to cancel their project reservation must provide written notification to the Energy Commission. The written notification must include:

- The date of the notification.
- The name of the project.
- The site address(es).
- A statement that the applicant would like to cancel the project reservation.
- The printed name and signature of the applicant.

CHAPTER V:
PV System and Energy Efficiency Verifications

This chapter covers the field verification requirements for PV systems and energy efficiency measures that eligible projects must complete to receive incentives. The verifications shall be completed before submitting the payment claim package.

A. PV System Verification

1. Background

All installed solar energy systems shall be third-party field-verified by a Home Energy Rating System (HERS) Rater to ensure that installations are consistent with the information used to determine the relative estimated performance and the final incentive amount. Field verification is a value-added service paid for by the applicant that provides quality control and can protect the applicant, builder, installer, supplier, and homeowner.

When field verification indicates that the installation is not consistent with the parameters used to calculate the relative estimated performance submitted in the NSHP application, the deficiencies must be corrected or the relative estimated performance must be recalculated based on the actual installation parameters.

When field verification indicates that the installation will achieve an estimated performance greater than that used for the reservation, the estimated performance may be recalculated at the applicant's option to reflect the higher performance. Any revised estimated performance documentation must be resubmitted to the Energy Commission. If field verification indicates that the system is installed outside the eligible azimuth range for NSHP participation, the reserved incentive shall be forfeited.[44]

The field verification and diagnostic testing procedures described in this chapter are intended to ensure that the:

- PV modules and inverters used in the expected performance calculations are installed at the applicable site.
- PV modules are minimally shaded, or if shaded, that the actual shading does not exceed the shading characteristics that were included in the expected performance calculations.

44 Allow +/- 5 degree tolerance; see Appendix D, Section B.

- Measured AC power output from the PV system is equal to or exceeds that calculated by the FI Calculator within the specified margin at the prevailing conditions at the time of field verification and diagnostic testing.

More information on how to take measurements and complete the tests in this chapter is found in Appendix D.

The results of the PV installer's verifications (as noted on the NSHP FI-2 or NSHP FI-2E) do not need to be uploaded to the HERS Registry. In these cases, the PV installer must complete and sign a hard copy of the form with an original signature. The applicant, installer, and HERS Rater are required to retain a copy for at least three years after the NSHP reservation expiration date and must provide a copy of the form upon request by the Energy Commission.

Third-party solar system verifications may employ a sampling approach. Applicants are not required to utilize sampling; in those cases, each system must be tested by a HERS Rater.

Sample groups may be formed using the following rules and guidelines:

- All systems in a sample group must be from the same subdivision by the same homebuilder or developer, and the same contractor/installer must have completed all solar systems in the sample group.
- No more than 15 systems may be assigned to a single group. However, a group may contain fewer should the group be "closed" (see below) prior to the assignment of the 15 systems.
- Systems using different solar plans or layouts may be placed within the same sample group. "Model testing" of different solar plans or layouts will not be required prior to completing sampling. (*Model testing* is where each unique solar plan must be tested at least once prior to allowing any system using that plan into a sample group.)
- A sample group will be considered "open" once a system has been assigned to the group. A group will be automatically "closed" once six months has elapsed from the date the group was opened.
- The solar installer must complete its portion of the solar verifications before assigning a system to a sample group.

Sample groups will complete the following verification process:

1. A sample group may not be submitted for verification to a HERS Rater until at least one system has been defined in the group. Up to the maximum of 15 systems may be assigned to the group.
2. Upon the request of the applicant or applicant's representative, the HERS Rater shall randomly choose one system from the group for testing.
3. If the system meets all the necessary requirements and completes all necessary testing, the HERS Rater shall enter the results of the test into the HERS Provider Data Registry. The result will be available to the applicant and its agents as a registered NSHP FI-3 document.

4. If the sample group contains fewer than 15 systems, the sample group will remain "open," during which time additional systems may be assigned to the sample group. These systems will not be required to complete HERS verification and will be passed by association with the tested system in the group. The HERS Provider Data Registry will note the approval by association of these systems and will issue a NSHP FI-3 showing approval by association.
5. Once the sample group has closed, either voluntarily by the applicant, applicant's representative, or HERS Rater, or automatically due to the six-month expiration period, no more systems shall be added to the group.

In circumstances where the HERS Rater finds a deficiency during the field verification, the HERS Rater shall notify the applicant or its agent of the issue and will register the failure with the HERS Provider Data Registry. The HERS Rater will then complete the testing protocol on a second system in the sample group. If there are no other systems in the sample group, the group will be considered incomplete until at least one other system has been added to the group and has had testing completed. Until completed, no systems in the group will be noted as passing verification. Should the second tested system fail the testing protocol, all systems in the group will require testing.

To illustrate an example of the NSHP sampling process, consider a subdivision project consisting of 15 single-family homes. Once the first home is built and the solar energy system is installed, the solar installer completes its portion of the verification, as required for each system. Once the solar energy system is verified by the solar installer, the system is eligible to be placed into a sample group. If a system is first to be verified within a project, a new sample group can be created to include this system. The HERS Rater then completes the final solar energy system verifications, and if the system passes, the entire sample group passes.

If multiple solar energy systems are completed concurrently (for example, three homes at once) and the installer completes the verifications, all three systems may be assigned to a new sample group. The HERS Rater will then randomly choose one of the three systems to test. The HERS Rater can also choose to wait to test until more systems are completed and test later.

Once a solar energy system in the group has been tested and verified, any additional systems added to the same sample group will automatically pass by association. New systems may be added to the sample group as it is still "open." This group will close once one of the following occurs:

- The sample group reaches 15 systems.
- Six months pass from the time the first system was added to the sample group.
- The group is voluntarily closed by the applicant, applicant's representative, or HERS Rater.

In the example project above, all 15 systems could be placed in the same sample group and passed, as long as they are all assigned to the group within six months of assignment of the first system.

2. Responsibilities

Field verification and diagnostic testing are the responsibility of both the PV system installer and the HERS Rater who completes the third-party field verification. The PV installer must perform the field verification and diagnostic testing procedures described in this document for every system that he or she installs. The HERS Rater, working under the oversight of an Energy Commission-approved HERS Provider[45], then performs independent third-party field verification and diagnostic testing of the systems.

The measurements required by the testing protocols are not required to be completed on the roof, but more accurate measurement techniques are possible with roof access. The measurements required by the protocols may be performed in multiple ways as described in the subsections below and in Appendix D.

3. Relationship to Other Codes, Standards, and Verification

The local jurisdiction must issue a building permit for the qualifying PV system, either as a separate permit or as part of the new residential building permit. The PV system must meet all applicable electrical code, structural code, building code, fire code, and local electric utility interconnection requirements.

The field verification and diagnostic testing procedures described in this document do not substitute for normal electrical, structural, or building plan check or field inspection, nor do they substitute for field verification by the local utility regarding interconnection to the electric grid.

4. FI Field Verification and Diagnostic Testing Process

The NSHP field verification and diagnostic testing of systems under the FI incentive structure shall follow the process below. For the NSHP, a PV system is one or more PV modules connected to one inverter.

i. The applicant enters the required information into the FI Calculator to generate a NSHP FI-1 form (FI Calculator Output) documenting the specific modules and inverter(s) to be used in each system, the appropriate climate zone, and a table of predicted electrical generation for each system for a range of irradiance and ambient air temperature. The NSHP FI-1 is provided to the Energy Commission with the reservation application. The associated input file (.huf) is provided to the HERS Provider to initiate the verification.

45 A person or entity wishing to be certified as a HERS Provider and Data Registry for the performance of field verification and diagnostic testing by HERS Raters as required by this guidebook shall seek approval from the Energy Commission in accordance with the certification program requirements in California Code of Regulations, Title 20, Section 1670 et seq. and Title 24, Sections 10-109 and 10-110.

ii. Once each PV system is installed, the PV installer completes the field testing and verification on the system and documents the results to verify they are consistent with the NSHP FI-1. Two testing protocols are available:

   a. A NSHP FI-2 form is completed for each system that is installed by the PV installer. To complete the form, the PV installer must complete testing outlined in Section A.5.

   b. For systems installed by an NSHP Established Installer, the PV installer may instead complete a Field Verification Affidavit (FI-2E) form for each system. Please refer to Chapter IV Section C for more information on the NSHP Established Installer designation.

iii. After the installer verifications are completed, a HERS Rater will complete the third-party verification procedures. The applicant shall provide the HERS Rater with product specifications (cut sheets) for the PV modules, inverter(s), and meter for the specific system, along with an invoice or purchase document that lists the make and model of the PV modules installed. The results of the test are submitted to the HERS Provider Data Registry and used to generate the NSHP FI-3.

iv. As part of the payment process, the Energy Commission will confirm in the HERS Provider Data Registry that the NSHP FI-3 has been completed for each PV system in the NSHP application. The Energy Commission may request that the applicant provide a copy of the NSHP FI-2/FI-2E if not available through the HERS Data Registry.

5. PV Installer Testing Protocols

The PV installer shall complete a series of testing procedures after installing the system to ensure it is in good working order and operating as expected. The results of the testing shall be recorded on the NSHP FI-2 (or NSHP FI-2E for Established Installers) and submitted to the Energy Commission directly or uploaded to the HERS registry. Moreover, the PV installer shall provide a copy to the homeowner or end user of the system.

The PV installer shall measure and record:

- The make, model, and quantity of modules, inverter(s), and meter(s) installed.
- The azimuth at which each array of the system is installed.
- Whether each array of the system meets the minimal shading criteria; if any do not, the PV installer shall record the annual solar access for each shaded array to determine the amount of system shading. This requires the installer to use a solar assessment tool and complete the process outlined in Appendix D, Sections C.1 and C.2.
- The solar irradiance in the plane of each array, as well as the ambient temperature. Using these measurements and the production table(s) from the NSHP FI-1, the installer shall record the expected system performance per array.
- The current production of the solar energy system (under stable conditions).

The PV installer will compare the expected system performance to the actual measured performance and confirm that the system output exceeds the expected production obtained from the table(s) generated by the FI Calculator.

Alternatively, installers who have been granted the Established Installer status may instead complete the NSHP FI-2E form. On this form, the installer attests that the system meets the requirements for FI and that safety testing has been completed, including, but not limited to testing of:

- Open circuit voltage.
- Ground continuity.
- Polarity.
- Insulation resistance.
- Combiner box.

By demonstrating their knowledge in installing PV systems, Established Installers will not be required to complete some of the additional tests normally required. Although not required to perform this testing, Established Installers are still encouraged to test as much as possible to ensure complete system functionality. They will still be required to warranty the system and be responsible for providing a level of protection to protect against underperforming or nonfunctional systems.

The verifications in this section are required for all systems and must be completed in their entirety. Noncompliance with these testing requirements may result in the Energy Commission barring the PV installer from NSHP participation.

6. HERS Rater Testing Protocols

Once the PV installer testing procedures have been completed, the HERS Rater must complete independent, third-party verifications of the solar system. The HERS Rater's inspection consists of a visual inspection of the system, along with a verification of the system performance and verification of the system shading. For the visual inspection, the HERS Rater shall use binoculars or another means to view the system without having to access the roof. The HERS Rater may rely on photographic evidence provided by the installer on the make, model, and quantity of PV modules, as well as shading. In the absence of such evidence, the rater must rely on a conservative determination based solely on his or her observation.

The results of the HERS Rater's verification shall be submitted to the HERS registry and recorded on the NSHP FI-3.

The HERS Rater shall measure or observe:

- The make, model, and quantity of modules, inverter(s), and meter(s) installed.
- The azimuth at which each array of the system is installed.

- Whether each array of the system meets the minimal shading criteria; if any do not, the HERS Rater shall record the annual solar access for each shaded array to determine the amount of system shading. This requires the installer use a solar assessment tool and complete the process outlined in Appendix D, Section C.1 and C.2. If the HERS Rater does not have direct access to the array, he or she may rely upon shading documentation completed by the PV installer.
- The solar irradiance in the plane of each array, as well as ambient temperature. Using these measurements and the production table(s) from the NSHP FI-1, the HERS Rater shall record the expected system performance per array.
- The current production of the solar energy system (under stable conditions).

Similar to the PV installer, the HERS Rater shall compare the expected and actual performance of the system to ensure that the system output exceeds the expected performance generated by the FI Calculator.

B. Energy Efficiency Verifications

1. Code-Compliant Verifications (2016/2013 Energy Standards)

A code-compliant NSHP home shall demonstrate the achieved energy efficiency measures through either:

- A signed certificate of occupancy or finalized, signed-off inspection record for the newly constructed home.
- Completion of all CF-3Rs required for Title 24 compliance in an approved HERS Provider Registry.

2. Tier I/II Verifications (*2013/2008 Energy Standards*)

A Tier I or Tier II NSHP application must identify a HERS Rater for the energy efficiency measures in addition to the solar energy system. (See Chapter V, Section A, for details about the solar energy system field verification process.) A HERS Rater will verify the installation of the energy efficiency measures for compliance with NSHP requirements. The energy efficiency measures include all applicable Title 24 HERS measures and the NSHP-specific Additional Energy Features Checklist (NSHP EE-3). Applicants may select a different HERS Rater for verification of Title 24 HERS measures, NSHP energy efficiency requirements, and the solar energy system, but the documentation must be submitted to the same HERS Provider. There may be energy efficiency inspections that need to take place early in construction; therefore, it is critical that there be good communication among the NSHP applicant, builder, solar installer, and HERS Rater to coordinate Title 24 or NSHP energy efficiency requirement verification.

EXCEPTION: Nonresidential and high-rise residential projects using a PERF-1 as energy efficiency documentation shall submit a final building permit signoff or occupancy permit. Furthermore, these projects do not need to identify an energy efficiency HERS Rater, nor do they need to submit a NSHP EE-3 form.

3. Additional Energy Features Checklist Verification Guidelines

The Additional Energy Features Checklist (NSHP EE-3) is required for all Tier I and Tier II projects and is completed by a HERS Rater to verify the energy efficiency requirements of the NSHP program. This verification is in addition to any verification required for any applicable Title 24, Part 6 HERS measures. The process to verify energy efficiency compliance involves a field inspection by a HERS Rater, where the measures listed on the NSHP EE-3 are checked off as having passed or failed inspection. The NSHP EE-3 will be prepopulated with information from the CF-1R submitted in the NSHP application and that has been uploaded to a HERS Provider Data Registry. The HERS Rater will need to check off only whether a measure passed or failed.

The NSHP EE-3 will verify the following features of a home:

- Opaque surfaces
- Glazing (window) values
- HVAC efficiency
- Water heater efficiency
- Radiant barrier installation

Items listed in the Opaque Surfaces section require the HERS Rater to verify the R-values[46] of insulation installed in the building. These items can be verified either by having a HERS Rater on-site while the item is accessible or by providing the HERS Rater with any of the following: photographs of the installed items, invoices for materials purchased, and any relevant CF-6Rs. Acceptance of photographs, invoices, and relevant CF-6Rs is solely at the discretion of the HERS Rater.

The HERS verification measure quality installation of insulation (QII) cannot be verified using photographs, invoices, or CF-6Rs. A HERS Rater must be on-site and perform the required verification prior to wall enclosure, or the QII may not be used to meet the NSHP energy efficiency requirements.

Items listed in the Glazing (Window) Values section require the rater to verify the area, solar heat gain coefficient (SHGC)[47], and U-factor[48] for each glazing product. Items listed in the HVAC

46 A measure of the resistance of an insulating or building material to heat flow. The higher the number, the greater the resistance to heat flow. (See http://www.dictionary.com/browse/r-value.)
47 The fraction of incident solar radiation admitted through a window, both directly transmitted and absorbed and subsequently released inward. Solar heat gain coefficient is expressed as a number between 0 and 1. The lower a window's solar heat gain coefficient, the less solar heat it transmits. (See http://www.efficientwindows.org/shgc.php.)

Efficiency section will require the rater to verify the cooling (for example, SEER)[49] and heating efficiency (for example, AFUE) of all HVAC units in the building. Items listed in the Water Heater Efficiency section will require the rater to verify the water heater efficiency values (for example, energy factor) of all water heaters installed in the building.

Each item listed on the NSHP EE-3 must be compared and verified against what was actually installed because each item is critical to the overall performance and energy savings of the building.

If an applicant is participating in a utility new construction energy efficiency program, such as the California Advanced Homes Program (CAHP), he or she must meet the energy efficiency requirements of that utility new construction energy efficiency program rather than the NSHP energy efficiency requirements (that is, the NSHP EE-3 will not be completed). See Chapter II, Section L, for additional information on participation in a utility new construction energy efficiency program.

48 The rate of heat loss is indicated in terms of the U-factor (U-value) of a window assembly. The lower the U-factor, the greater the resistance of a window to heat flow and the better the insulating properties of the window. (See http://www.efficientwindows.org/ufactor.php.)
49 Seasonal energy efficiency ratio, which is a ratio of the total cooling capacity divided by the total electric energy input during the same period (See http://www.ahrinet.org/Homeowners/Save-Energy/Seasonal-Energy-Efficiency-Ratio.aspx).

CHAPTER VI:
Payment Process

This chapter identifies the information and steps to receive the incentive payment. To be eligible, all applicants must first have followed the instructions outlined in Chapter IV in securing a reservation. In addition, the solar energy system must be completely installed, grid-connected, and operating satisfactorily, and the building must comply with the energy efficiency specifications proposed in the applicant's reservation.

The applicant must complete the Payment Claim Form (NSHP-2), and mail it to the Energy Commission on or before the reservation expiration date. A prefilled NSHP-2 is also available by logging into the Web Tool (http://nshp/WebPages/Public/Login.aspx) and downloading an electronic copy from the Site Attachments page of the application.

If the complete NSHP-2 is mailed to the Energy Commission on or before the reservation expiration, the applicant is provided an additional three months or 90 calendar days, whichever is longer, after the reservation expiration date to complete and submit the remaining required supporting documentation that make up the payment claim package to the Energy Commission.

If the reservation expires before the completed NSHP-2 has been mailed to the Energy Commission, or the required supporting documentation is not completed and submitted to the Energy Commission within the three-month or 90-calendar-day period provided as described above, the applicant will be required to reapply under the program eligibility requirements and incentive levels in effect at the time of the reapplication. **No time extensions or exceptions will be granted under any circumstances, except as provided in Appendix A, Section O. Applicants are strongly encouraged to complete their project three to six months before the reservation expiration date to provide time for unexpected delays.**

Applicants with an approved project reservation with a payment claim that has not yet been approved may request that the project be subject to the reservation criteria and processes identified in this *NSHP Guidebook, Tenth Edition*. Applicants subject to an older edition of the NSHP Guidebook may need to refer to that guidebook for requirements specific to older applications.

The payment claim package consists of:

- Payment Claim Form (NSHP-2).
- Proof of interconnection.
- Energy efficiency verification forms (CF-3Rs and NSHP EE-3).
- PV verification forms (NSHP FI-2/FI-2E, NSHP FI-3).
- Revised NSHP FI-1 (if applicable).
- Warranty and final cost documentation form (NSHP-3).

- Lease or PPA (if applicable).

Detailed information on each of the required forms and documentation is below.

A. Forms and Documentation

1. Payment Claim Form (NSHP-2)

When the solar energy system has been installed, the applicant may submit the completed NSHP-2 to request payment. The completed NSHP-2 must identify any changes (for example, changed equipment, installer, or equipment seller) that have been made to the information submitted since the reservation was approved. Additional pages may be attached, if needed. See Chapters III and IV for how reservation changes may affect application eligibility or the incentive amount.

The NSHP-2 requests applicants to submit information on solar energy equipment and installation costs. If the HERS rating cost can be identified by unit, the HERS rating cost shall also be reported.

The applicant or authorized representative may use the NSHP-2 to assign the incentive payment to another party. If the applicant assigns his or her rights to receive the incentive payment to one party and then cancels that assignment, the applicant may subsequently reassign his or her right to receive payment to another party. Applicants that assign their incentive payment to another party will still be reported as the recipients of the incentive payments for tax purposes.

The NSHP-2 with original signatures (copies are not accepted) must be submitted to the Energy Commission by mail. The Energy Commission encourages applicants to sign with blue or other ink that is distinguishable as original. Stamped signatures will not be accepted.

2. Proof of System Interconnection With Utility Grid

The solar energy system must be interconnected before, or within, the three-month or 90-calendar-day period after the reservation expiration date. The Energy Commission will verify that the system has been approved for interconnection by the utility within three months or 90 calendar days, whichever is later, of the reservation expiration date. This verification will occur prior to approval of a payment claim. Each utility may have different requirements for a complete interconnection package. Applicants are strongly encouraged to contact their utility interconnection department for specific requirements. The applicant must provide proof from the electric utility that the solar energy system is interconnected to the utility distribution grid and that the utility has approved the interconnection of the system.

If the system is virtual net-metered, the Energy Commission will verify that the system generation allocation percentages provided on the NSHP reservation application form (NSHP-1)

match the system generation allocation percentages provided to the utility interconnection department. If the system generation allocation percentages do not match, the system generation allocation percentages provided to the utility interconnection department will be used to recalculate the correct incentive payment amount.

3. Proof of Energy Efficiency Verification—Final Building Permit or Completed Energy Efficiency Field Verifications (CF-3R, NSHP EE-3 Forms)

a. Code-Compliant Projects

The applicant must submit or complete one of the following:

i. A copy of the final building permit signoff or certificate of occupancy is required. The address on the final building permit or certificate of occupancy must match the address on the payment claim form (NSHP-2).

ii. Energy efficiency documentation: The Energy Commission will confirm, in the HERS Provider Data Registry that the Certificate(s) of Field Verification and Diagnostic Testing (CF-3R) are completed as applicable.

b. Tier I and Tier II Projects

The Energy Commission will confirm, in the HERS Provider Data Registry, that the following documentation is complete:

- Certificate(s) of field verification and diagnostic testing (CF-3R), as applicable
- Additional Energy Features Checklist (NSHP EE-3)

A complete description of the energy efficiency verification documentation requirements can be found in Chapter V, Section B. For projects using a PERF-1 as energy efficiency documentation, the final building permit signoff or certificate of occupancy shall be submitted to the Energy Commission. For projects using a PERF-1 as energy efficiency documentation, the NSHP EE-3 form is not required.

4. PV Field Verification Documentation (FI-2/FI-2E, FI-3 Forms)

A HERS Rater must complete a PV field verification and diagnostic testing form (NSHP FI-3) for each solar energy system consistent with the procedures found in Chapter V, Section A. HERS Raters must be certified and work under the oversight of an Energy Commission-approved NSHP HERS Provider. Web links to HERS Providers can be found at www.energy.ca.gov/HERS.

The NSHP FI-3 must be generated through the HERS Provider Data Registry. The applicant must provide the solar energy system information specified in Chapter V, Section A, to the HERS Rater for each solar energy system being tested. In cases where the NSHP FI-3 shows that the installed solar energy system is not consistent with the NSHP FI-1 that has been previously submitted to the Energy Commission, a revised NSHP FI-1 that reflects the actual installation

shall be prepared and submitted. When such an inconsistency is found when the sampling approach is used, a revised NSHP FI-1 shall be prepared for all systems in the group that were sampled as necessary, consistent with the resampling and corrective action procedures described in Chapter V.

Applicants may be required to submit PV installation verification forms (NSHP FI-2) to the Energy Commission upon request. Sites submitted on behalf of an approved NSHP Established Installer may submit the Field Verification Affidavit (FI-2E) form in lieu of the NSHP FI-2 for sites that are sample-group tested. The Energy Commission reserves the right to request a copy of the Field Verification Certificate at any time.

5. Revised NSHP FI-1 (If Applicable)

For any eligible applications that experience changes to the equipment or other details calculated in the FI Calculator since the reservation application was approved, a revised NSHP FI-1 will be required for payment to be approved. The details of the revised NSHP FI-1 should accurately reflect the installed system and must be consistent with other documentation in the payment claim application.

6. Ten-Year Warranty and Final Cost Confirmation (NSHP-3)

A 10-year warranty form (NSHP-3) must be completed and signed by the appropriate party(ies). The applicant must provide final total system cost documentation clearly identifying the final amount paid or legally incurred by the applicant, lessor, or owner of the solar energy system (in the case of a PPA), as applicable, for the purchase and installation of the solar energy system.

For owner-builder installed systems, please submit copies of the manufacturers' 10-year warranties for the inverter(s) and solar electric generating equipment. See Chapter II, Section K, for additional information on warranties.

7. Lease Agreement or Power Purchase Agreement (PPA)

Solar energy systems that are leased[50] by an end-use customer or that provide electricity to an end-use customer under a PPA are eligible for NSHP funding if the lease agreement or PPA is executed and has a start date on or after July 1, 2009. Lease agreements and PPAs that are executed or have a start date before July 1, 2009, are not eligible for funding even though the system may have been installed after this date. Lease agreements and PPAs must have an initial term of no less than 10 years and must provide the lessee or customer the option to remove the system at no cost to the lessee or customer at the end of the initial term of the agreement.

50 Not applicable to sites already covered by the Established Installer Reservation Form. See Chapter IV Section E for more information.

Any other options provided to the lessee or customer, such as the option to renew the agreement or purchase the system, should be clearly described in the lease agreement or PPA. In addition, lease agreements and PPAs must reference the NSHP funding that benefits the end-use customer by reducing the lease payments for the system or the cost of electricity produced by the system.

For the first five years of the lease or PPA, the lessor (in the case of a lease) or owner of the solar energy system (in the case of a PPA) shall provide an annual status report to the Energy Commission on the operation of the NSHP-funded solar energy system. The report shall address agreements executed through December 31 of each year, be submitted to the Energy Commission no later than January 31 of each year, and shall include:

1) The date that the agreement was fully executed and the start date of the agreement.
2) The operational status of the system.
3) The status of the agreement and, if status has changed, date of change and reason for the change. (Status changes primarily include change in lessee or customer, system purchase, termination of agreement, and system removal.)

If any lease agreement or PPA for a system that received funding from the NSHP is terminated and the system is removed from the building on which it was originally installed within the 10-year warranty period, the Energy Commission **may** request repayment of all, or a portion of, the NSHP funding provided for that system. Repayment will not be required if a system is destroyed by natural disaster or fire at no fault of the lessor/owner or lessee/customer.

The lessor or system owner is responsible for repayment of NSHP funding and is required to inform the lessee or end-use customer of this requirement. The lease agreement or PPA shall include provisions that specifically discuss repayment obligations of the NSHP funding when there is early termination of the lease agreement or PPA, and identify that the party responsible for repayment of the NSHP funding to the Energy Commission is the lessor or system owner.

EXCEPTION: If the lessee or end-use customer receives the NSHP funding directly from the Energy Commission, the lessee or end-use customer may provide a lease agreement or letter signed by the lessee or end-use customer that identifies the lessee or end-use customer as the party responsible for repayment of the NSHP funding to the Energy Commission if the lease agreement or PPA is terminated early. Under these circumstances, the lease agreement or PPA does not need to demonstrate that the NSHP funding benefits the end-use customer by reducing the lease payments for the system or the cost of the electricity produced by the system.

Nothing in this section precludes an applicant from using an otherwise valid reservation to request a rebate for a system that is leased or that provides electricity through a PPA.

B. Additional Information on Payment Claims

Applicants must mail the complete NSHP-2 to the Energy Commission on or before the reservation expiration date specified on the NSHP-2. If the applicant mails a complete NSHP-2 to the Energy Commission on or before the reservation expiration date, the applicant is provided an additional three months or 90 calendar days, whichever is later, after the reservation expiration date to complete and submit the remaining required supporting documentation that make up the payment claim package to the Energy Commission.

Applicants must ensure that all program requirements as stated in Chapter II have been met before submitting a complete payment claim package. A payment claim package consists of the forms and documentation identified in this chapter.

A payment claim package is for one residential unit. Multiple payment claim packages for multiple residential units may be submitted at the same time. Applicants who reserve more than one residential unit in the program are not required to have completely installed all systems in their reservations before submitting a payment claim package. Applicants are strongly encouraged to keep copies of all documents included in the payment claim package submitted to the Energy Commission.

If, during the Energy Commission review, the complete payment claim package is found to contain minor errors or discrepancies, the Energy Commission will request clarification from the applicant. The applicant will be responsible for obtaining revised information from the equipment seller, installer, or HERS Rater to process the request. The Energy Commission will allow the applicant up to 15 business days to respond with corrections to all the unclear information to approve payment.

If the complete NSHP-2 is mailed to the Energy Commission after the expiration date of the reservation, or the payment claim package is otherwise ineligible, the Energy Commission will not process the payment claim package, and the reserved incentive will be returned to the NSHP. The applicant may reapply for an incentive reservation but will be subject to the program eligibility requirements, incentive levels, and funding available at the time of the reapplication. **Applicants are strongly encouraged to complete their project three to six months before the reservation expiration date to provide time for unexpected delays.**

The complete payment claim package must be submitted to the Energy Commission. For mailing address, fax, and contact information, please visit www.gosolarcalifornia.ca.gov/contacts/consumers.php. Alternatively, if the applicant had previously submitted the application via the NSHP Application Web Tool, the applicant may choose to submit all the documents in the payment claim package, except the NSHP-2, through the Web Tool as well. Applicants are strongly encouraged to use the Web Tool for submitting payment claim documents.

The Energy Commission intends to make payments within six to eight weeks of receipt of a complete payment claim package. Payment will be made to the payee and mailed to the address on the NSHP-2 and Payee Data Record (STD-204).

1. Switching to FI If a Reservation Is Under a Previous Guidebook

For projects with an existing reservation under a previous edition of the NSHP Guidebook, the entire reservation may be changed to the FI incentive structure if the sites meet the FI eligibility criteria. The applicant or authorized representative must submit a request to the Energy Commission to have all sites that have not yet claimed payment change to the FI incentive structure, along with a NSHP FI-1 for the remaining sites. The incentive amount for the remaining sites will be calculated using the NSHP FI-1 but will not be used to alter the current project funding balance.

For market-rate and affordable housing residential unit projects, the reservation will remain at the incentive level under which the project was reserved. For affordable housing common area projects that qualify for the affordable housing incentive, the project will be funded at the affordable housing incentive level in effect at the time the request is submitted.

The Energy Commission may notify the applicant or other project contact of projects eligible for the new incentive structure but does not guarantee that all applicants with eligible projects will be contacted. It is the responsibility of the applicant and his or her agent to monitor program requirements and submit requests to the Energy Commission.

2. Adding to Existing Systems

Once incentives are paid, changes to expand or otherwise improve the expected performance of a system(s) are not eligible for NSHP funding. Homeowners otherwise ineligible for NSHP funding may apply to the California Solar Initiative Program administered by the CPUC. See **www.gosolarcalifornia.ca.gov/csi/index.php** for additional information and requirements.

3. Claiming an Incentive Payment Without a Prior Reservation

If a solar energy system has been installed without a prior incentive reservation, and the applicant subsequently wishes to receive an incentive from the NSHP program, the reservation process in Chapter IV must still be followed. However, applicants should be aware that program eligibility requirements and incentive levels at the time of application/payment claim submission might have changed since the system installation, resulting in necessary system modifications, lower incentives, or ineligibility for incentives.

List of Acronyms and Abbreviations

2008 Energy Standards	-	*2008 California Building Energy Efficiency Standards*, Title 24, Part 6
2013 Energy Standards	-	*2013 California Building Energy Efficiency Standards*, Title 24, Part 6
2016 Energy Standards	-	*2016 California Building Energy Efficiency Standards*, Title 24, Part 6
AC	-	Alternating current
AHRI	-	Air-Conditioning, Heating and Refrigeration Institute
AAA	-	American Arbitration Association
BIPV	-	Building-integrated photovoltaic
BVES	-	Bear Valley Electric Service
CABEC	-	California Association of Building Energy Consultants
CAHP	-	California Advanced Homes Program
CEA	-	Certified Energy Analyst
CECPV Calculator	-	California Energy Commission's PV Calculator
CEPE	-	Certified Energy Plans Examiner
CF-1R	-	Certificate of compliance
CF-2R/CF-6R	-	Certificate of installation
CF-3R/CF-4R	-	Certificate of verification
CPUC	-	California Public Utilities Commission
CSI	-	California Solar Initiative
CSLB	-	Contractors State License Board
EER	-	Energy efficiency ratio
EPBI	-	Expected Performance-Based Incentive
FI Calculator	-	Flexible Installation Calculator
Guidebook	-	*New Solar Homes Partnership Guidebook*
HERS	-	Home Energy Rating System
HCD	-	Housing and Community Development
HUD	-	Housing and Urban Development
IOU	-	Investor-owned utility
kW	-	Kilowatt
kWh	-	Kilowatt-hour
MW	-	Megawatt
NABCEP	-	North American Board of Certified Energy Practitioners
NSHP	-	New Solar Homes Partnership
NSHP EE-3	-	Additional Energy Efficiency Features Checklist
PERF-1	-	Performance certificate of compliance
PG&E	-	Pacific Gas and Electric
PPA	-	Power purchase agreement
PV	-	Photovoltaic
REC	-	Renewable Energy Certificate
SB	-	Senate Bill
SCE	-	Southern California Edison Company
SDG&E	-	San Diego Gas & Electric Company
SEER	-	Seasonal energy efficiency ratio
SHGC	-	Solar heat gain coefficient
Energy Standards	-	*CA Building Energy Efficiency Standards*, Title 24, Part 6
TCAC	-	Tax Credit Allocation Committee
TDV	-	Time-dependent valuation
VNM	-	Virtual net metering

Glossary of Terms

Capacity — the maximum amount of electricity that a generating unit, power facility, or utility can produce under specified conditions. Capacity is measured in kilowatts or megawatts.

Distributed generation facility — a small-scale electricity generation facility that is interconnected to a distribution network and is generally 20 MW or smaller. Distributed generation facilities may serve on-site load or off-site load or both.

Electrical corporations — Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E), Southern California Edison Company (SCE), PacifiCorp, Liberty Energy-California Pacific Electric Company (formerly Sierra Pacific Power Company), Bear Valley Electric Service (a division of Golden State Water Company), or other electrical corporations as defined by Public Utilities Code Section 218. Also referred to as "investor-owned utilities."

End-use customer (end user) — a residential or commercial electric customer who buys electricity to be consumed as a final product (not for resale).

Energy design rating – the sum of the annual TDV energy consumption for energy use components included in the performance compliance approach for the standard design building (see "Standard Design") and the annual TDV energy consumption for lighting and components not regulated by Title 24, Part 6 (such as domestic appliances and consumer electronics). The Energy Design Rating can also account for the annual TDV energy offset by an onsite renewable energy system. Compliance software certified by the Energy Commission for the *2016 Energy Standards* calculates the energy design ratings both with and without PV. See *Energy Provisions of the California Green Building Standards Code* for additional information.

Established Installer – a designation to high-volume applicants with proven success in applying to the NSHP program. The purpose is to streamline application process and reduce administrative burdens associated with large developments. See Chapter IV, Section C for more information.

Grid — the electrical transmission and distribution system linking power plants to customers through high-power transmission line service.

Investor-owned utility (IOU) — synonymous with "electrical corporations" as defined herein. Refers collectively to Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), and Bear Valley Electric Service (a division of Golden State Water Company), the four electrical corporations whose ratepayers were subject to a surcharge for funding various public goods programs, including the Energy Commission's New Solar Homes Partnership program.

Kilowatt (kW) — 1,000 watts. a unit of measure for the electricity needed to operate given equipment. A typical home using central air conditioning and other equipment might have a demand of 4-6 kW on a hot summer afternoon.

Kilowatt-hour (kWh) — the most commonly used unit of measure telling the amount of electricity consumed over time. It means one kilowatt of electricity supplied for one hour. A typical California household consumes about 500 kWh in an average month.

Megawatt (MW) — 1,000 kilowatts. One megawatt is about the amount of power to meet the peak demand of a large hotel.

Metered — the independent measurement with a standard meter of the electricity generated by a project or facility.

Net metering — contractual agreement or tariff wherein the system owner/generator produces more electricity than is needed to serve the on-site electrical load, and the surplus electricity is supplied to the electrical distribution grid. The owner/generator's utility meter records the difference, or net, between what the utility supplies to the owner/generator and what the owner/generator supplies to the grid.

On-site generation — See "Distributed generation facility."

PG&E — Pacific Gas & Electric Company

Photovoltaic (PV) — a technology that uses a semiconductor to convert sunlight directly into electricity.

Placed in service — refers to a generating system that has been installed, is operational, and is capable of producing electricity.

Project — "project" refers to all otherwise eligible generating systems installed during the term of this program at one physical location, and may include multiple system sites within a project, serving the electrical needs of all real and personal property at this location, as evidenced by the electric utility meter(s) for this location.

PTC — PVUSA Test Conditions, which were developed to test and compare PV systems as part of the PVUSA (Photovoltaics for Utility Scale Applications) project. PTCs are 1,000 watts per square meter solar irradiance, 20 degrees C air temperature, and wind speed of 1 meter per second at 10 meters above ground level. PV manufacturers use standard test conditions, or STC, to rate their PV products. STC are 1,000 watts per square meter solar irradiance, 25 degrees C cell temperature, air mass equal to 1.5, and ASTM G173-03 standard spectrum. The PTC rating, which is lower than the STC rating, is generally recognized as a more realistic

measure of PV output because the test conditions better reflect "real-world" solar and climatic conditions, compared to the STC rating.

Public Goods Charge (PGC) — a surcharge applied to the electric bills of IOU ratepayers used to support energy efficiency, public interest research, development and demonstration, and low-income and renewable energy programs and collected pursuant to Public Utilities Code Section 399 et seq. The Public Goods Charge expired on December 31, 2011, and was not reauthorized by the Legislature.

Public information — any information in the Energy Commission's possession that is not subject to a request or determination of confidential designation pursuant to Title 20 of the California Code of Regulations, Section 2505 et seq., and may be disclosed pursuant to the California Public Records Act (Government Code Section 6250, et seq.) and the Information Practices Act (Civil Code Section 1798, et seq.).

Renewable — a power source other than a conventional power source within the meaning of Public Utilities Code Section 2805. Section 2805 states: " 'Conventional power source' means power derived from nuclear energy or the operation of a hydropower facility greater than 30 megawatts or the combustion of fossil fuels, unless cogeneration technology, as defined in Section 25134 of the Public Resources Code, is employed in the production of such power."

Renewable energy public goods charge — as defined in Public Resources Code Section 25741, Subdivision(c), to mean that portion of the nonbypassable system benefits charge required to be collected to fund renewable energy and to be transferred to the Renewable Resource Trust Fund pursuant to the Reliable Electric Service Investments Act (Article 15 [commencing with Section 399] of Chapter 2.3 of Part 1 of Division 1 of the Public Utilities Code).

Renewables Portfolio Standard (RPS) — "Renewables Portfolio Standard" is defined in Public Utilities Code Section 399.12, Subdivision (i), to mean the specified percentage of electricity generated by eligible renewable energy resources that a retail seller or local publicly owned electric utility is required to procure pursuant to Public Utilities Code Section 399.11 et seq. Under the RPS, a retail seller or local publicly owned electric utility must increase its total procurement of eligible renewable energy resources so that 33 percent of its retail sales are procured from eligible energy resources no later than December 31, 2020.

Residential building – includes a newly constructed house, condominium, apartment, or other residential unit that has not been used or occupied for any purpose. For NSHP purposes, this also includes common areas in single and multifamily developments shown to be for the primary benefit of the residential occupants.

SCE — Southern California Edison Company

SDG&E — San Diego Gas & Electric Company

Self-generation — See "Distributed generation facility."

Solar thermal electric — the conversion of sunlight to heat and its concentration and use to power a generator to produce electricity.

Standard design – A computer model of a house with a set of performance levels for building components (known as Package A) predefined by the Title 24, Part 6, Energy Standards. Approved computer programs model a house with the features of Package A to determine the standard design envelope, space conditioning, and water-heating budgets. See Chapters 1.6.3 and 1.6.4 of the *Residential Compliance Manual for the 2016 Building Standards* for additional information.

Watt — a unit of electrical power, equal to the power developed in a circuit by a current of one ampere flowing through a potential difference of one volt.

APPENDIX A: Administration

A. Authority

This *NSHP Guidebook* is adopted pursuant to Public Resources Code Section 25747, Subdivision (a), and Section 25784, which direct the California Energy Commission to adopt guidelines governing the New Solar Homes Partnership program authorized by Public Resources Code Sections 25740 through 25751. This guidebook adopted pursuant to this authority is exempt from the rulemaking requirements of the Administrative Procedures Act, as specified in Chapter 3.5 (commencing with Section 11340) of Division 3 of Title 2 of the Government Code. This guidebook may be revised pursuant to Public Resources Code Section 25747, Subdivision (a), and Section 25784.

B. Interpretation

Nothing in this guidebook shall be construed to abridge the powers or authority of the Energy Commission or any Energy Commission-designated committee as specified in Division 15 of the Public Resources Code, commencing with Section 25000, or Division 2 of Title 20 of the California Code of Regulations, commencing with Section 1001.

C. Effective Date

New editions of the guidebook shall take effect once adopted by the Energy Commission at a publicly noticed business meeting pursuant to Public Resources Code Section 25747, Subdivision (a), and Section 25784, unless otherwise stated in the guidebook. The guidebook may be given retroactive effect as specified by the Energy Commission and according to its statutory authority.

D. Substantive Changes

The Energy Commission may make substantive changes to this guidebook pursuant to Public Resources Code Section 25747, Subdivision (a), and Section 25784. Substantive changes shall take effect once adopted by the Energy Commission at a publicly noticed business meeting, unless a future effective date is provided, with no fewer than 10 days public notice. Substantive changes include, but are not limited to:

- Changes in the eligibility or evaluation criteria.
- Changes to funding or incentives levels.

E. Approval and Cancellation of NSHP Reservations

1. Reservation Approval

Funding under the NSHP program shall be awarded to eligible applicants through the issuance of reservations as specified in this guidebook. Formal Energy Commission approval of each reservation is not required. Funding for reservations shall be encumbered in accordance with the Energy Commission's applicable budgeting procedures.

2. Reservation Cancellation

The Energy Commission, through its Executive Director, may cancel the reservation for any project that changes the basis for program eligibility under this guidebook and no longer satisfies the requisite eligibility criteria. The Executive Director shall notify the applicant in writing of the basis for cancelling the applicant's reservation, the effective date of the cancellation, and the terms and conditions for the repayment of any portion of the NSHP incentive the applicant was not otherwise entitled to receive. The written notice required herein shall be given at least 15 days before the effective date of the cancellation to provide the applicant an opportunity to file a petition for reconsideration under Appendix A, Section K.

F. Funding Award Payments

Funding award payment shall be made to applicants as specified in this guidebook. However, funding award payments shall not be made under any of the following conditions:

- The Executive Director determines, under Appendix A, Section E, that the applicant is no longer eligible to receive a funding award.
- The applicant fails to properly request payment from the Energy Commission, as specified in this guidebook.
- An audit conducted pursuant to Chapter VI, Section G, reveals an applicant's request for payment, submitted under the requirements of this guidebook, is overstated, inaccurate, or unsupported.
- The applicant fails to repay the Energy Commission for any overpayment the applicant received as specified in the written notice issued under Appendix A, Section G.
- Based on an investigation conducted under Appendix A, Section M.2, the Executive Director determines that the applicant has misstated, falsified, or misrepresented information in applying for a funding award, in invoicing for a funding award payment, or in reporting any information required by this guidebook.

G. Audits

The Energy Commission or its authorized agents may audit any applicant to verify the accuracy of any information included as part of a reservation application, payment claim, or report

required under this guidebook. As part of an audit, an applicant may be required to provide the Energy Commission or its authorized agents with all information and records necessary to verify the accuracy of any information included in the applicant's reservation application, payment claims, or reports. An applicant may also be required to open its business records for on-site inspection and audit by the Energy Commission or its authorized agents to verify the accuracy of any information included in the applicant's reservation application, payment claims, and reports.

If an audit finds that an applicant has incorrectly stated or falsified information included on the applicant's reservation application, payment claims, or reports, the Energy Commission shall notify the applicant of its findings in writing within 30 days of completing the audit. Based on the audit results, an applicant may be required to refund all or a portion of the NSHP incentive payments it has received. In addition, the applicant's reservation may be cancelled pursuant to Chapter VI, Section E, and enforcement actions initiated pursuant to Chapter VI, Section M.

H. Record Retention

Applicants shall keep all records relating to and verifying the accuracy of any information included as part of a reservation application, payment claim, or report submitted pursuant to this guidebook. These records shall be kept for no fewer than three years after the end of the calendar year in which the reservation application is approved or the final payment claim is made, whichever is longer. These records shall be made available to the Energy Commission or its authorized agents as part of any audit conducted pursuant to this guidebook.

I. Use and Disclosure of Information and Records

The Energy Commission or its authorized agents may use any information or records submitted to the Energy Commission or obtained as part of any audit pursuant to this guidebook to determine eligibility and compliance with this guidebook, evaluate the NSHP program or related Energy Commission program, and prepare necessary reports as required by law. The information and records include, but are not limited to, reservation applications, payment claims, and any documentation submitted in support of said reservation applications or payment claims.

Information and records submitted pursuant to this guidebook will be disclosed to other governmental entities and policing authorities for civil and criminal investigation and enforcement purposes. This information and records may also be disclosed to the public pursuant to the California Public Records Act (Government Code Section 6250, et seq.). Personal information, such as taxpayer identification or social security numbers, will not be disclosed to the public.

Information concerning the identity of applicants and the amount or payment of reservations is public information and will be disclosed pursuant to the California Public Records Act. This information, along with other public information describing program participants, may be disclosed to members of the public to educate them and encourage further program participation. The information may be disclosed through the Energy Commission's website or other means, as the Energy Commission deems appropriate.

If, as part of any reservation application, payment claim, required report, or audit, the Energy Commission requires the applicant to provide copies of records that the applicant believes contain proprietary information entitled to protection under the California Public Records Act or other law, the applicant may request that such records be designated confidential pursuant to the Energy Commission's regulations for confidential designation, Title 20, California Code of Regulations, Section 2505.

J. Tax Consequences

Applicants are responsible for any federal and state tax associated with the receipt of incentive payments. The Energy Commission will report incentive payments to the Internal Revenue Service and issue the applicant an informational form (for example, 1099-Misc) when required to do so by law. To process payment claims for tax purposes, applicants must complete a Payee Data Record form to provide the Energy Commission taxpayer information. The taxpayer identified in this form must be the payee as identified in the reservation application. Applicants who assign their NSHP incentive(s) to third parties will be reported as the recipient of said payment and issued the informational form when required by law. Applicants should carefully consider the tax consequences of receiving an NSHP incentive when applying to the NSHP.

K. Reconsideration of Funding Awards, Reservation Cancellations

Pursuant to Public Resources Code Section 25747, Subdivision (c), applicants of funding may appeal the Energy Commission's denial, reduction, cancellation, or revocation of a reservation or payment claim under this guidebook. Appeals will be considered as provided in this section only upon a showing that factors other than those described in this guidebook were applied by the Energy Commission in denying, reducing, canceling, or revoking a reservation or payment claim.

1. Executive Director Reconsideration of a Reservation Application

An applicant may petition the Executive Director for reconsideration if the reservation application was denied or the reservation amount was reduced or cancelled. The petition for reconsideration shall be in writing and shall be submitted, with any supporting documentation, to the Office of the Executive Director at the following address within 30 days of the date of the notice of the reservation cancellation, reduction, or revocation.

California Energy Commission
Office of the Executive Director
1516 9th Street, MS-39
Sacramento, CA 95814-5512

The petition shall:

- Specify the basis for the appeal.
- State why the petitioner believes the reservation application or payment claim denial, cancellation, reduction, or revocation is improper given the eligibility criteria for the reservation or payment claim.
- Explain any supporting documentation filed with the petition.
- Identify any legal authority or other basis supporting the petitioner's position, and identify the remedy sought.

Within 60 days of receiving a complete petition, the Office of the Executive Director shall issue a decision based on the petition and the written response of Energy Commission staff.

If petitioner disagrees with the decision of the Office of the Executive Director, the petitioner may appeal the decision to the Energy Commission in accordance with Appendix A, Section K.2.

2. Energy Commission Appeals

Within 30 days of the date of the decision of the Office of the Executive Director, the appealing party may file a letter of appeal to the Energy Commission. The letter of appeal shall be submitted to the Energy Commission and processed as a request for investigation pursuant to the Energy Commission's regulations for complaints and investigations, Title 20, California Code of Regulations, Section 1230, et seq. The letter of appeal shall include the information specified in Title 20, California Code of Regulations, Section 1231 (b). In place of the information specified in Sections 1231 (b)(2), (b)(4), and (b)(6), the letter of appeal shall identify the eligibility criteria in this guidebook that the appealing party believes were applied incorrectly in denying, reducing, canceling, or revoking the funding. Energy Commission staff shall be designated the respondent in the letter of appeal.

In addition to the information required by Title 20, California Code of Regulations, Section 1231, the letter of appeal shall include a copy of the petition for reconsideration and all supporting documentation, and a copy of the written decision of the Office of the Executive Director.

An applicant seeking to file a petition for reconsideration or appeal pursuant to this section may contact the Public Adviser's Office for information on the filing process. The contact information for the Public Adviser's Office is:

California Energy Commission
Public Adviser's Office
1516 9th Street, MS-12
Sacramento, CA 95814-5512
Email: PublicAdviser@energy.ca.gov

L. Disputes of Incentive Payments

Pursuant to Public Resources Code Section 25747, Subdivision (c), an applicant may appeal the Energy Commission's payment of an incentive under this guidebook. Appeals will be considered only as provided in this section and upon a showing that factors other than those described in this guidebook were applied by the Energy Commission in making, reducing, or denying an incentive payment.

1. Accounting Office Review

Applicants may dispute the amount of an incentive payment by filing a written claim with the Energy Commission's Accounting Office. Applicants shall file the claim within 30 days of the date of the payment, the amount of which is disputed, or a notice from the Energy Commission's Accounting Office indicating no payment will be made. The claim must be filed, together with any evidence supporting the applicant's position, with the Energy Commission's Accounting Office at the following address:

California Energy Commission
Accounting Office
1516 9th Street, MS-2
Sacramento, CA 95814-5512

The claim shall identify the payment in dispute, the date on which payment was received or expected, an explanation of the evidence supporting the applicant's position, any legal authority or other basis supporting the applicant's position, and the amount of repayment sought. The Accounting Office will review the claim within 30 days of its receipt, determine its validity, and provide the applicant with a written decision supported by its reasons. The written decision shall specify that portion of the claim, if any, determined to be valid and the amount and date when payment will be made. If the applicant disagrees with the decision of the Accounting Office, the applicant may seek reconsideration with the Office of the Executive Director in accordance with Appendix A, Section L.2.

2. Executive Director Review

Within 30 days of the date of the written decision of the Accounting Office, the applicant may file a letter of reconsideration stating why he or she believes the written decision to be unacceptable. The letter shall be filed with the Office of the Executive Director, along with a

copy of the original dispute claim, supporting documents, and the written decision of the Accounting Office, at the following address:

California Energy Commission
Office of the Executive Director
1516 9th Street, MS-39
Sacramento, CA 95814-5512

The Office of the Executive Director will review the letter of reconsideration within 30 days of its receipt, assess the Accounting Office's written decision, and provide the applicant with a written decision. The written decision shall specify whether the Accounting Office's determination shall be upheld, whether any portion of the applicant's original dispute claim is deemed valid, and the amount and date that any repayment will be made. If the applicant disagrees with the decision of the Office of the Executive Director, the applicant may appeal to the Energy Commission in accordance with Appendix A, Section L.3.

3. Energy Commission Appeals

Within 30 days of the date of the decision of the Office of the Executive Director, the applicant may file a letter of appeal with the Energy Commission. The letter of appeal shall be submitted to the Energy Commission and processed as a request for investigation pursuant to the Energy Commission's regulations for complaints and investigations, Title 20, California Code of Regulations, Section 1230, et seq. The letter of appeal shall include the information specified in Title 20, California Code of Regulations, Section 1231 (b). In place of the information specified in Sections 1231 (b)(2), (b)(4), and (b)(6), the letter of appeal shall identify the criteria in this guidebook that the applicant believes were applied incorrectly in making, reducing, or denying the incentive payment. Energy Commission staff shall be designated the respondent in the letter of appeal.

In addition to the information required by Title 20, California Code of Regulations, Section 1231, the letter of appeal shall include a copy of the original disputed claim and supporting documents, and copies of the Accounting Office and Office of the Executive Director written decisions.

An applicant seeking to file a letter of reconsideration or appeal pursuant to this section may contact the Public Adviser's Office for information on the filing process at the address above.

M. Enforcement Action

1. Recovery of Overpayment

The Energy Commission may direct the Energy Commission's Office of Chief Counsel to commence formal legal action against any applicant or former applicant to recover any portion of an incentive payment that the Executive Director determines the applicant or former applicant was not otherwise entitled to receive.

2. Fraud and Misrepresentation

The Executive Director may initiate an investigation of any applicant that the Executive Director has reason to believe may have misstated, falsified, or misrepresented information in submitting a reservation application, payment claim, or reporting any information required by this guidebook. Based on the results of the investigation, the Executive Director may take any action deemed appropriate, including, but not limited to, cancellation of the reservation, recovery of any overpayment, and, with the concurrence of the Energy Commission, recommending the Attorney General initiate an investigation and prosecution pursuant to Government Code Section 12650, et seq., or other provisions of law.

N. Arbitration

If an applicant's dispute of the incentive payment is not resolved to the satisfaction of the applicant through the appeal process specified in Section L, the applicant and the Energy Commission may mutually agree to have the dispute resolved through binding arbitration. The arbitration proceeding shall take place in Sacramento County, California, and shall be governed by the commercial arbitration rules of the American Arbitration Association (AAA) in effect on the date the arbitration is initiated. One arbitrator who is an expert in the particular field of the dispute shall resolve the dispute. The arbitrator shall be selected in accordance with the aforementioned commercial arbitration rules. The decision rendered by the arbitrator shall be final, and judgment may be entered upon it in accordance with the applicable law in any court having jurisdiction thereof. The demand for arbitration shall be made no later than 6 months after the date the Energy Commission renders a decision through the appeal process specified in Section L, irrespective of when the dispute arose and irrespective of the applicable statute of limitations for a suit based on the dispute. If the applicant and the Energy Commission do not mutually agree to arbitration, the sole forum to resolve the dispute is state court.

The cost of arbitration shall be borne by the applicant and Energy Commission as follows:

- The AAA's administrative fees shall be borne equally by the parties.
- The expense of a stenographer shall be borne by the party requesting a stenographic record.
- Witness expenses for either side shall be paid by the party producing the witness.
- Each party shall bear the cost of its own travel expenses.
- All other expenses shall be borne equally by the parties, unless the arbitrator apportions or assesses the expenses otherwise as part of his or her award.

O. Limited Extensions of Time

The Executive Director may waive and extend the reservation period, including the additional 3-month or 90-calendar-day period after reservation expiration, or the building permit application period under limited circumstances based on the following criteria and process.

1) The NSHP applicant shall submit a written request for an extension of time to the Office of the Executive Director at the following address:

California Energy Commission
Office of the Executive Director
1516 9th Street, MS-39
Sacramento, CA 95814-5512

2) The request shall include the following information:

   a) The name and address of the applicant.

   b) The project name and NSHP project reservation number.

   c) The amount of additional time being requested for the applicant to complete the project and submit a completed NSHP-2 or submit the documentation required during the 3-month or 90-calendar-day period after reservation expiration, or the amount of additional time needed to submit the building permit for the solar energy system or to receive an issued permit.

   d) An explanation of:

      i. The circumstances why the applicant is or was unable to complete the project on time and submit a completed NSHP-2 prior to the expiration date of the reservation, or

      ii. The circumstances why the applicant is or was unable to submit the documentation required during the three-month or 90-calendar-day period after reservation expiration, or

      iii. The circumstances why the applicant is or was unable to submit the building permit for the solar energy system or receive an issued permit within the required period, and

      iv. Whether these circumstances were beyond the applicant's control.

   e) An explanation of any other good cause that exists for granting the request for an extension of time.

f) Documentation, if available, to support the information provided in items (a) through (e).

3) The Executive Director may grant an extension of time if he or she determines there were circumstances beyond the applicant's control that caused a delay in the completion of the project and precluded the applicant from submitting a completed NSHP-2 prior to the expiration date of the reservation or submitting the documentation required during the three-month or 90-calendar-day period after reservation expiration, or precluded the applicant from applying for a building permit for the solar energy system or receiving an issued permit within the required time period. For this determination, the circumstances shall be limited to natural events or disasters, such as wildfires, or unanticipated construction-related delays that could not be avoided by the applicant. Poor planning, carelessness, or negligence of the applicant or his/her agents, or ignorance of the applicable NSHP Guidebook requirements or deadlines do not constitute circumstances beyond the applicant's control.

4) The extension of time granted by the Executive Director shall be limited to that time reasonably necessary for the applicant to complete the project and submit a completed NSHP-2 or submit the documentation required during the three-month or 90-calendar-day period after reservation expiration, or that period reasonably necessary for the applicant to submit the building permit for the solar energy system to the code enforcement agency or receive an issued permit. Under no circumstances shall an extension of time exceed six months or extend beyond December 31, 2021, whichever is less.

5) Requests for time extensions may be submitted only for projects with an approved reservation and must be submitted before or within the 3-month or 90-calendar-day period, whichever is later, after reservation expiration, or before or within 15 business days of notification of payment claim disapproval from Energy Commission staff, whichever is later.

P. HERS Provider Process for Receiving NSHP Approval of HERS Registry

A person or entity wishing to be certified as a HERS Provider and Data Registry for the performance of field verification and diagnostic testing by HERS Raters as required by this guidebook shall seek approval from the Energy Commission in accordance with the certification program requirements in California Code of Regulations, Title 20, Section 1670 et seq. and Title 24, Sections 10-109 and 10-110.

APPENDIX B: Resources

A. NSHP Program Participants

- **Applicant** – The applicant must be either the homeowner or builder/developer who has committed to install solar equipment on one or more newly constructed residential units. The solar installer cannot be the applicant.
- **Primary Contact** - Person or entity designated by the applicant to be contacted if the NSHP program administrator has questions regarding the application, or if corrections are needed.
- **Alternate Contact** – Person or entity to be contacted by the NSHP program administrator if the primary contact is not available.
- **Authorized Representative** – Person or entity to whom the applicant has assigned administrative rights on the NSHP-1. The authorized representative may do the following on behalf of the applicant: 1) sign the NSHP-2, 2) reassign incentive payment, 3) cancel a reservation, and 4) request an existing reservation be subject to the FI incentive structure (if applicable).
- **Payee** – The person or entity who receives the incentive payment. The payee may be designated on the NSHP-1 and reassigned on the NSHP-2. If not otherwise designated, the payee shall default to the applicant.
- **Solar Installer** – The person or entity in charge of the installment of the solar energy system on the site (may also be responsible for procurement of system equipment and materials). The solar installer is also responsible for completing the solar system verifications (see Chapter V) and for working with the HERS Rater to correct system deficiencies.
- **Energy Consultant** – The person responsible for completing the energy efficiency documentation required by Title 24 and NSHP, the energy consultant may also provide technical advice or feedback to the applicant in the design of the home and the planned energy efficiency features. For projects complying with the Tier I or Tier II requirements, the energy consultant must be a Certified Energy Analyst certified by the California Association of Building Energy Consultants (CABEC) for the Energy Standards applicable to the project.
- **Home Energy Rating System (HERS) Rater** – The person in charge of completing third-party, independent verifications (see Chapter V) on the solar energy system and the home's energy efficiency features. The HERS Rater is required to have the appropriate certification from an approved HERS Provider, and for submitting the results of the verifications to the HERS Provider's online document registry.

B. NSHP Program Administrator Contact Information and Other Useful Resources

Program Administrator	
California Energy Commission Renewables Call Center: Toll Free in CA: (844) 421-6229 Outside of CA: (916) 653-0237 Fax: (916) 654-4421 Mailing Address: California Energy Commission New Solar Homes Partnership 1516 Ninth St, MS 45 Sacramento, CA 95814	CEC Website: www.energy.ca.gov Email: renewable@energy.ca.gov In the event of changes to the mailing address or contact information, please visit http://www.gosolarcalifornia.ca.gov/contacts/consumers.php for current information.
Useful Links	
GoSolarCalifornia • NSHP Guidebook • NSHP Training Seminars • NSHP Forms and Documents • Incentive Calculator Downloads • CEC Lists of Eligible Equipment • Basic Information on Solar NSHP Application Web Tool	www.gosolarcalifornia.ca.gov www.newsolarhomes.org
Find a Solar Contractor	
Database of Solar Installers, Contractors, and Retailers in California	www.gosolarcalifornia.ca.gov/database/search-new.php
Energy Consultants and HERS Raters	
California Association of Building Energy Consultants (CABEC) CalCERTS, Inc. ConSol Home Energy Efficiency Rating Services (CHEERS)	www.cabec.org www.calcerts.com www.cheers.org
Consumer Protection	
Contractors State License Board – Check your contractor's license CalSEIA – Investigates solar customer complaints	www.cslb.ca.gov www.calseia.org

C. Plan Check Checklist

This checklist expedites the required plan check process. **Applications submitted without the following documents will be returned to the applicant. Additional documentation may be requested during the plan check process.**

1. A complete set of construction plans[51] that contain:

   - Architectural, electrical, mechanical, and plumbing information (as applicable).
   - A window and door schedule that shows sizes and includes all skylights (if not on the floor plan).
   - Elevation, wall, roof, and floor construction assemblies.
   - Floor finish schedule (if CF-1R shows high mass design).
   - A list of lots and addresses (for residential developments).
   - A site plan with a north arrow (for custom homes).

2. Compliance forms and electronic files:

   - Hard copy of the final CF-1R or PERF-1 signed by a CEPE or CEA.
   - Electronic input file(s) for the CF-1R or PERF-1.

3. Equipment and materials documentation:

   - Windows, glazed doors, skylights—specification sheet with manufacturer's name that demonstrates U-factor and solar heat gain coefficient (SHGC).
   - Space-heating equipment—specification sheet with manufacturer's name/model number and efficiency rating for each unit.
   - Air conditioner—specification sheet with manufacturer's name/model numbers for condenser/coil match or AHRI reference number for each proposed unit. (www.Ahridirectory.org) that has an efficiency rating greater than SEER 14, EER 11.7.
   - Water heater—specification sheet with manufacturer's name/model number and efficiency rating. If installing a solar water heater, a solar water heating calculation form (CF-SR) from either the California F-chart (OG 100) or solar fraction calculator for rated systems (OG 300) is required.
   - Roofing material—specification sheet that shows emissivity and reflectivity value of product.
   - Specification sheets for any special features or equipment used for compliance with the energy efficiency requirements.

4. Additional requirements:

   - For appliances provided by the builder, specification sheets with manufacturer's name/model number that demonstrate the appliance is ENERGY STAR®-labeled if ENERGY STAR is applicable to that appliance. Only products listed under the "Appliances" heading of the ENERGY STAR website need to be verified as ENERGY STAR-labeled.[52]

51 Plans may be submitted electronically as a .pdf file or printed plans may be mailed to the Energy Commission (minimum plan size of 15" x 21").
52 www.energystar.gov/index.cfm?c=products.pr_find_es_products.

D. Determining If the PV Credit Was Needed for Compliance, and the Effect on the Incentive

In some circumstances, the PV credit may be claimed and integrated into the energy model on the CF-1R, but may not be needed to meet the required reduction in energy budget. As noted, it is the applicant's responsibility to determine whether the PV credit is needed to meet the Energy Standards and to notify the Energy Commission if the credit only provides TDV reductions above and beyond what is needed to comply. This section will provide guidance on how to determine if the credit was needed for compliance.

a. Single Orientation Plan

Figure B-1: Single Orientation Plan Energy Use Summary

ENERGY USE SUMMARY				
04	05	06	07	08
Energy Use (kTDV/ft^2-yr)	Standard Design	Proposed Design	Compliance Margin	Percent Improvement
Space Heating	22.18	17.75	4.43	20.0%
Space Cooling	5.49	1.79	3.70	67.4%
IAQ Ventilation	1.06	1.06	0.00	0.0%
Water Heating	8.48	8.48	0.00	0.0%
Photovoltaic Offset	----	-8.41	8.41	----
Compliance Energy Total	37.21	20.67	16.54	44.5%

Source: California Energy Commission

For a plan that is unique to a specific orientation of home, the CF-1R will display an energy use summary similar to the above. In this case, the energy budget reflects only the unique orientation entered as part of the energy model.

To determine if the credit was needed, compare the compliance margin of the Photovoltaic Offset (in the red box) and Compliance Energy Total (in the green box). If compliance margin for the Compliance Energy Total is larger than the margin provided by the Photovoltaic Offset then the credit was not needed to comply with the Energy Standards. An alternative would be to see if the difference of the Compliance Energy Total and Photovoltaic Offset is greater than zero.

The credit is not needed if either is true:

- (Compliance Energy Total margin) > (Photovoltaic Offset margin)
- (Compliance Energy Total margin) – (Photovoltaic Offset margin) > 0

Should the model not meet the above, the credit is needed for the model to remain compliant with the *2016 Energy Standards* and will be factored into the FI incentive calculation.

b. Multiple Orientation Plan

Figure B-2: Multiple Orientation Plan Energy Use Summary

ENERGY USE SUMMARY				
Energy Use (kTDV/ft²-yr)	**Standard Design**	**Proposed Design**	**Compliance Margin**	**Percent Improvement**
Space Heating	4.84	4.04	0.80	16.5%
Space Cooling	6.14	4.39	1.75	28.5%
IAQ Ventilation	1.13	1.13	0.00	0.0%
Water Heating	9.25	9.25	0.00	0.0%
PV Credit	----	-5.87	5.87	----
North Facing Compliance Total	**21.36**	**12.94**	**8.42**	**39.4%**
Space Heating	4.84	5.15	-0.31	-6.4%
Space Cooling	6.14	7.59	-1.45	-23.6%
IAQ Ventilation	1.13	1.13	0.00	0.0%
Water Heating	9.25	9.25	0.00	0.0%
PV Credit	----	-5.87	5.87	----
East Facing Compliance Total	**21.36**	**17.25**	**4.11**	**19.2%**
Space Heating	4.84	5.13	-0.29	-6.0%
Space Cooling	6.14	3.44	2.70	44.0%
IAQ Ventilation	1.13	1.13	0.00	0.0%
Water Heating	9.25	9.25	0.00	0.0%
PV Credit	----	-5.87	5.87	----
South Facing Compliance Total	**21.36**	**13.08**	**8.28**	**38.8%**
Space Heating	4.84	5.09	-0.25	-5.2%
Space Cooling	6.14	6.98	-0.84	-13.7%
IAQ Ventilation	1.13	1.13	0.00	0.0%
Water Heating	9.25	9.25	0.00	0.0%
PV Credit	----	-5.87	5.87	----
West Facing Compliance Total	**21.36**	**16.58**	**4.78**	**22.4%**

cate of Compliance is not registered

Source: California Energy Commission

Subdivision projects often use plans generated using the multiple orientations option, in which case the energy model will calculate the energy use for the home in the four cardinal orientations. The energy use summary will display the reduction in energy budget for each of the four orientations (see the above); all four orientations must meet the Energy Standards for the plan to be used for compliance.

To determine if the credit is needed, the procedure is similar to the above, except each of the four orientations must meet the criteria. In the example, the north and south orientations meet the criteria; however, the east and west orientations do not. In this case, the credit is required to meet the Energy Standards in some orientations of this home and the credit must be factored into the incentive calculation.

E. Identifying High-Performance Walls and Attics on the CF-1R

Table B-1 lists the insulation requirements for high-performance walls and attics (as applicable) for each climate zone.

The wall U-Factor and ceiling R-Value must be obtained regardless of other conditions to meet the prescriptive package. If the air handler for the HVAC and the ducts are located in the attic, the roofing insulation must meet one of the R-values depending on whether the insulation is above the roof rafters or in-between, and whether there is an air space between the roof deck and roofing. If the ducts and air handler are located in conditioned spaces, only the ceiling and wall requirements must be met.

Table B-1: Prescriptive Package Requirements (HPA and HPW)

Climate Zone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Wall U-Factor[53]	0.051	0.051	0.051	0.051	0.051	0.065	0.065	0.051	0.051	0.051	0.051	0.051	0.051	0.051	0.051	0.051
Ceiling R-Value	R-38	R-38	R-30	R-38	R-30	R-30	R-30	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38
Roof R-Value (if above roof rafter)[54]	N/A	N/A	N/A	R-8, R-6	N/A	N/A	N/A	R-8, R-6	R-8, R-6	R-8, R-6	R-8, R-6	R-8, R-6	R-8, R-6	R-8, R-6	R-8, R-6	R-8, R-6
Roof R-Value (if between roof rafter)[54]	N/A	N/A	N/A	R-18, R-13	N/A	N/A	N/A	R-18, R-13	R-18, R-13	R-18, R-13	R-18, R-13	R-18, R-13	R-18, R-13	R-18, R-13	R-18, R-13	R-18, R-13

Source: 2016 Energy Standards, Table 150.1-A

53 "Traditional" framed walls only. Mass walls have different requirements; see Table 150.1-A of the *2016 Energy Standards*. Smaller U-Factors are more efficient, so the listed values are maximums rather than minimums.

54 First number is if there is no air space between the roof deck and roofing, while second number is if there is an air space.

APPENDIX C:
Energy Efficiency Requirements by Building Occupancy

Building Type	Code-Compliant Energy Efficiency Requirements	Tier I Energy Efficiency Requirements	Tier II Energy Efficiency Requirements
Low-Rise Residential[55]	***2013* or *2016 Energy Standards***: Compliance with the Energy Standards as indicated on the CF-1R ***2008 Energy Standards***: Not eligible	***2016 Energy Standards***: N/A ***2008* or *2013 Energy Standards***: Total compliance margin better than standard of at least 15%	***2016 Energy Standards***: N/A ***2013 Energy Standards***: Total compliance margin better than standard of at least 30% ***2008 Energy Standards***: Total compliance margin and space-cooling margin better than standard of at least 30%
High-Rise Residential[56]	***2013* or *2016 Energy Standards***: Compliance with the Energy Standards as indicated on the PERF-1 ***2008 Energy Standards***: Not eligible	***2016 Energy Standards***: N/A ***2013 Energy Standards***: Total compliance margin[57] better than standard of at least 10% ***2008 Energy Standards***: Total compliance margin[57] better than standard of at least 15%	***2016 Energy Standards***: N/A ***2013 Energy Standards***: Total compliance margin[57] better than standard of at least 15% ***2008 Energy Standards***: Total compliance margin[57] and space-cooling margin better than standard of at least 30%
Detached common area[58]	***2013* or *2016 Energy Standards***: Compliance with the Energy Standards as indicated on the PERF-1 ***2008 Energy Standards***: Not eligible	***2013* and *2016 Energy Standards***: N/A ***2008 Energy Standards***: Total compliance margin[57] better than standard of at least 15%	***2008, 2013* and *2016 Energy Standards***: N/A

55 A building, other than a hotel/motel that is of Occupancy Group R, Division 1, and is multifamily with three stories or fewer, or a single-family home of Occupancy Group R, Division 3, or an Occupancy Group U building located on a residential site. Refer to Title 24, Part 2, for building occupancy groups.
56 A building, other than a hotel/motel, of Occupancy Group R, Division 1 with four or more habitable stories. High-rise residential buildings are subject to the provisions of the Energy Standards for nonresidential buildings. Refer to Title 24, Part 2, for building occupancy groups.
57 Excluding receptacle, process, and process lighting. *Process* is an activity or treatment that is not related to the space conditioning, lighting, service water heating, or ventilating of a building as it relates to human occupancy. See the *2016, 2013,* and *2008 Energy Standards* for additional information.
58 Additional energy efficiency requirements: For multifamily developments, at least one residential building must meet the same energy efficiency requirements as the detached nonresidential building. For single-family residential developments (subdivisions), all homes in the residential development must meet the same energy efficiency requirements as the detached nonresidential building.

Building Type	Code-Compliant Energy Efficiency Requirements	Tier I Energy Efficiency Requirements	Tier II Energy Efficiency Requirements
Low-rise mixed-use where the CFA[59] of the nonresidential occupancy comprises no more than 20 percent of the building CFA.[60]	***2013* or *2016 Energy Standards*:** Compliance with the Energy Standards as indicated on the CF-1R ***2008 Energy Standards*:** Not eligible	***2016 Energy Standards*:** N/A ***2008* or *2013 Energy Standards*:** Total compliance margin better than standard of at least 15%	***2016 Energy Standards*:** N/A ***2013 Energy Standards*:** Total compliance margin better than standard of at least 30% ***2008 Energy Standards*:** Total compliance margin and space-cooling margin better than standard of at least 30%
Low-rise mixed-use where the CFA of the nonresidential occupancy comprises more than 20 percent of the building CFA.[61]	***2013* or *2016 Energy Standards*:** Residential occupancy complies with the Energy Standards as indicated on the CF-1R, **AND** nonresidential occupancy complies with the Energy Standards as indicated on the PERF-1 ***2008 Energy Standards*:** Not eligible	***2016 Energy Standards*:** N/A ***2013 Energy Standards*:** Residential occupancy with total compliance margin at least 15% better than standard, **AND** nonresidential occupancy complies with the Energy Standards ***2008 Energy Standards*:** Residential occupancy with total compliance margin at least 15% better than standard, **AND** Nonresidential occupancy with total compliance margin[57] at least 15% better than standard	***2016 Energy Standards:*** N/A ***2013 Energy Standards*:** Residential occupancy with total compliance margin at least 30% better than standard, **AND** nonresidential occupancy complies with the Energy Standards ***2008 Energy Standards*:** Residential occupancy with total compliance margin and space-cooling margin at least 30% better than standard, **AND** nonresidential occupancy with total compliance margin[57] at least 15% better than standard
High-rise mixed-use where the CFA of the nonresidential occupancy comprise no more	***2013* or *2016 Energy Standards*:** Compliance with the Energy Standards as indicated on the PERF-1 ***2008 Energy Standards*:** Not eligible	***2016 Energy Standards*:** N/A ***2013 Energy Standards*:** Total compliance margin[57] better than standard of at least 10% ***2008 Energy Standards*:** Total compliance margin[57] better than	***2016 Energy Standards*:** N/A ***2013 Energy Standards*:** Total compliance margin[57] better than standard of at least 15% ***2008 Energy Standards*:** Total compliance margin[57] and space-

59 *Conditioned floor area* (CFA) is the floor area (in square feet) of enclosed conditioned space on all floors of a building, as measured at the floor level of the exterior surfaces of exterior walls enclosing the conditioned space.
60 A solar energy system serving electrical loads in the entire mixed-use building shall be eligible for NSHP. The entire building is subject to the provisions of the Energy Standards for low-rise residential buildings. These requirements are based on the modeling of the building as a whole on a single Title 24 document.
61 The portion of a solar energy system serving electrical loads in the nonresidential occupancy shall be eligible for NSHP only if it is a common area. The incentive for the common area will be limited to the code-compliant level for the *2016* and *2013 Energy Standards*, and Tier I for the *2008 Energy Standards*. Each occupancy shall meet the provisions of the Energy Standards applicable to that occupancy, and shall be modeled on separate Title 24 compliance documents (CF-1R and PERF-1).

Building Type	Code-Compliant Energy Efficiency Requirements	Tier I Energy Efficiency Requirements	Tier II Energy Efficiency Requirements
than 20 percent of the building CFA.		standard of at least 15%	cooling margin better than standard of at least 30%
High-rise mixed-use where the CFA of the nonresidential occupancy comprise more than 20 percent of the building CFA[61].	***2013* or *2016 Energy Standards*:** Residential occupancy complies with the Energy Standards as indicated on the PERF-1, **AND** nonresidential occupancy complies with the Energy Standards as indicated on the PERF-1 ***2008 Energy Standards*:** Not eligible	***2016 Energy Standards*:** N/A ***2013 Energy Standards*:** Residential occupancy with total compliance margin[57] at least 10% better than standard, **AND** nonresidential occupancy complies with the Energy Standards ***2008 Energy Standards*:** Residential occupancy with total compliance margin[57] at least 15% better than standard, **AND** nonresidential occupancy with total compliance margin[57] at least 15% better than standard	***2016 Energy Standards*:** N/A ***2013 Energy Standards*:** Residential occupancy with total compliance margin[57] at least 15% better than standard, **AND** nonresidential occupancy complies with the Energy Standards ***2008 Energy Standards*:** Residential occupancy with total compliance margin[57] and space-cooling margin at least 30% better than standard, **AND** nonresidential occupancy with total compliance margin[57] at least 15% better than standard

Source: California Energy Commission

APPENDIX D:
PV System Field Verification and Diagnostic Testing Methods

A. Background

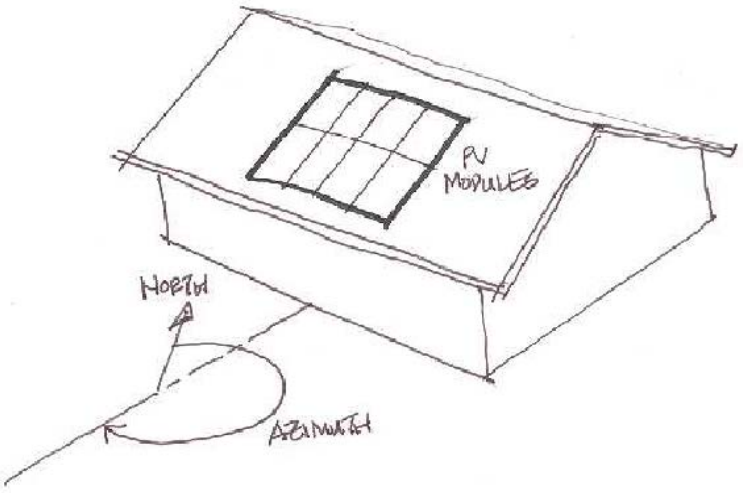
Both the PV installer and a HERS Rater are required to complete a certain level of testing as part of the NSHP process. This testing includes a visual inspection of the system, verification of any obstructions causing shading to the PV system, and a test of the system performance. This appendix outlines the methods through which the installer and HERS Rater complete the necessary testing.

B. Field Verification Visual Inspection

The visual inspection, as described in this protocol, verifies the installation of the proper equipment and the installation conditions specified on the NSHP FI-1. The HERS Rater shall use binoculars or another means to view the installation without having to access the roof. The HERS Rater may rely on photographic evidence provided by the installer on the make, model, and quantity of PV modules and shading, but in the absence of such evidence, must rely on a conservative determination based solely on his or her observation.

The PV installer and the HERS Rater shall verify that the azimuth of the PV modules installed in the field match the values allowed by FI, within ± 5 degrees. In some systems, PV modules may be installed in multiple orientations with different azimuths. In these cases, the azimuth of each array must be verified. The convention that is used for measuring azimuth is to determine the degrees of angle clockwise from north: north azimuth is zero degrees, east is 90 degrees, south is 180 degrees, and west is 270 degrees. (See Figure D-1).

Figure D-1: Azimuth of the PV Array



Source: California Energy Commission

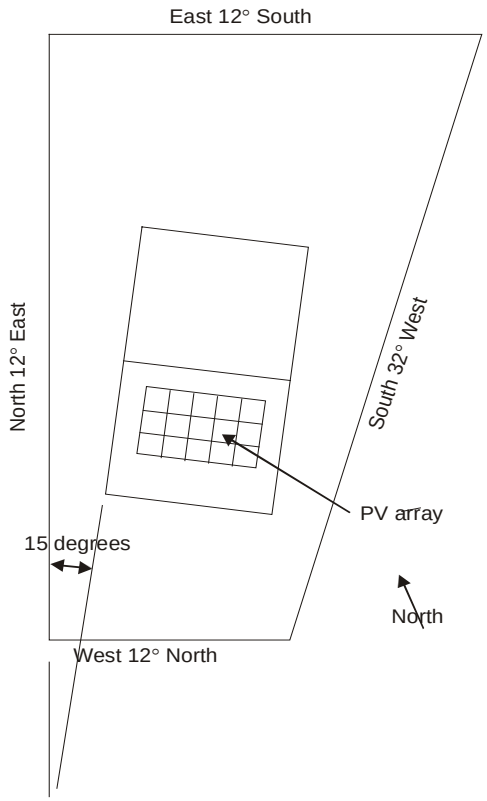
The following methods may be used to determine the azimuth.

1. Using the Site Plans

In new subdivisions, the house plans will often not show the property lines since the plans are used on multiple lots. However, the subdivision plot plan will show the property lines of the lots. The plot plan will show the bearing of the property lines. From this information, the azimuth of the roof surfaces where the PV modules are mounted may be determined from the position of the house on the lot relative to the bearings of the property lines.

Figure D-2 shows an example plot plan with a house located on it. In this case, the house does not align with any of the property lines but is rotated 15 degrees from the westerly property line, as shown. Property lines on plot plans are typically labeled in terms of their bearing, which is the direction of the line. The westerly property line is labeled "North 12˚ East." If the house were aligned with this property line, the southerly exposure of the house would have an azimuth of 192˚ (180˚ plus the 12˚ bearing of the property line). Since the house is rotated an additional 15˚, the azimuth of the southerly face of the house and the azimuth of the PV array are 207˚ (192˚ plus 15˚). Usually, the house will be aligned with one of the property lines, and the calculation described above will be simplified.

Figure D-2: Example Plot Plan



Source: California Energy Commission

2. Using a Compass With a Sighting Feature and an Adjustment for Magnetic Declination

Make sure that the compass has a sighting feature. The compass may have an adjustment built in for magnetic declination so that the reading on the compass is true north, or the installer and the HERS Rater shall determine the magnetic declination using the tool available at http://www.ngdc.noaa.gov/geomag-web/ and adjust the compass reading to account for the magnetic declination. Position the compass and determine the angle between compass north and the direction that the PV modules face. It is usually convenient and most accurate to align the compass along the edge of the array using the sighting feature. (See Figure D-3.)

Figure D-3: Compass With a Sighting Feature



Source: www.rei.com/product/638694/brunton-eclipse-8099-compass , www.opticsplanet.net/silva-olive-drab-compass-15118.html

C. Shading Verification

Shading of photovoltaic systems, even partial shading of arrays, can be the most important cause of failure to achieve high system performance. Significant shading should be avoided whenever possible. Shading can be avoided by careful location of the array at the point of installation, or by moving obstructions to locations where they do not cast shade on the array. Partial shading from obstructions that are relatively close to the array, particularly obstructions that are on the roof, even if they are relatively small, can be particularly problematic because they cause partial shading of the array for longer periods of the year. Shading caused in the future due to the maturing of trees that are immature at the time of installation of the PV system can also be a major cause of failure to achieve high performance over the life of the PV system.

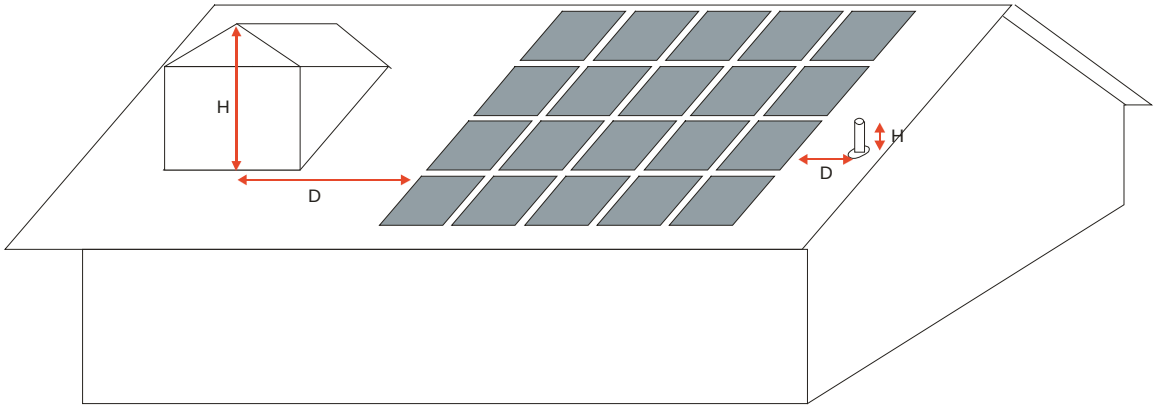
The PV installer and the HERS Rater must verify that the shading conditions on the PV system in the field are consistent with those used in the expected performance calculations. The estimated performance calculations will be done either assuming that the minimal shading criterion is met or based on the specific shading characteristics of each system.

1. Minimal Shading Criterion

The minimal shading criterion is that no obstruction is closer than a distance ("D") of twice the height ("H") it extends above the PV array. (See Figure D-4 for an artistic depiction of "H" and "D.") As the figure illustrates, the distance "D" must be at least two times greater than the distance "H." All obstructions that project above the point on the array that is closest to the obstruction must meet this criterion for the array to be considered minimally shaded. Obstructions that are subject to this criterion include:

- Any vent, chimney, architectural feature, mechanical equipment, or other obstruction that is on the roof or any other part of the building.
- Any part of the neighboring terrain.
- Any tree that is mature at the time of installation of the PV system.
- Any tree that is planted on the building lot or neighboring lots or planned to be planted as part of landscaping for the building. (The expected shading must be based on the mature height of the tree.)
- Any existing neighboring building or structure.
- Any planned neighboring building or structure that is known to the applicant or building owner.
- Any telephone or other utility pole that is closer than 30 feet from the nearest point of the array.

Figure D-4: The Minimal Shading Criterion Artistic Depiction of "H" and "D"



Source: California Energy Commission

To determine whether the minimal shading criterion is met, the PV installer or HERS Rater shall determine for each shading obstruction the smallest ratio of the horizontal distance from the obstruction to the array divided by the vertical height of the obstruction above that point on the array. (This is the “closest point on the array”). Often the point on the obstruction that results in the smallest ratio is the topmost point of the obstruction, but in cases where the shape of the obstruction is complex, points on the obstruction that are not the topmost but are closer to the array may actually produce the lowest ratio. “H” is the height of the shading obstruction point above the horizontal projection to the closest point on the array. “D” is the horizontal distance from the closest point on the array to the vertical projection from the point on the obstruction that results in the lowest ratio of “D” divided by “H.” Any obstruction located north of all points on the array need not be considered as shading obstructions. When an obstruction is north of some parts of an array but east, south, or west of other parts of the array, the minimal shading criterion shall be determined to the closest point on the array that is west, north, or east of the obstruction.

The PV installer and the HERS Rater may verify through visual inspection that all obstructions meet the 2:1 criterion. (An altitude angle of 26.6 degrees is equivalent to the 2:1 criterion.) For obstructions that visual inspection indicates potentially do not meet the criterion, the PV installer and HERS Rater must measure the height and distance of the obstruction(s) relative to the PV array as described above to verify that the 2:1 shading criterion (or a lower than 26.6 altitude angle through the same points on the obstruction and array) is met. A tolerance of ± 5 percent will be permissible when determining the ratio (or the altitude angle).

2. Accounting for Actual Shading

When a PV installation does not meet the minimal shading criterion, it can still qualify for an incentive and participate in the NSHP program, but the shading conditions for each PV system at the site must be accounted for in the expected performance calculation as described in this section.

The PV installer and the HERS Rater must verify that the shading conditions that exist (or are expected to exist)[62] at the site will not cause greater shading of the PV array than the shading characteristics that were used in the expected performance calculations.

Measurements made with a solar assessment tool are required to ascertain the extent of the shading conditions on the PV system from existing obstructions. The PV installer will typically use this procedure, as the HERS Rater may not have direct access to the array and, if not, would rely on the adequacy of documentation by the installer to confirm the shading conditions.

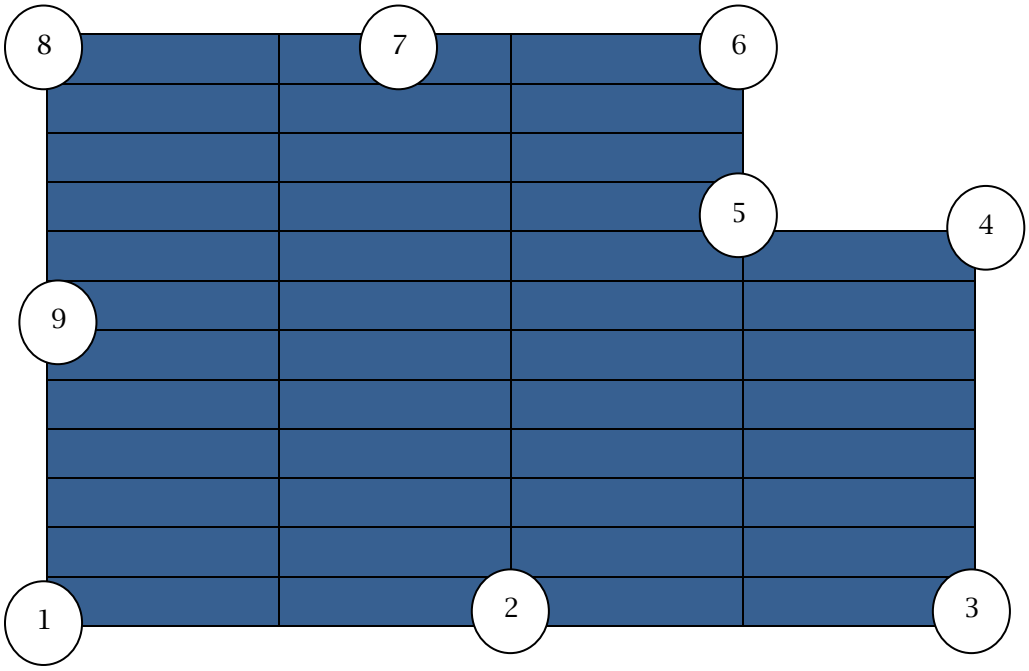
At each measurement point, the tool is placed on the PV array, leveled, and oriented consistent with the manufacturer's instructions. Once the tool is properly positioned, it will determine the obstructions that cast shade and the month and time of day when shading will occur. The tool will enable these determinations using either a digital photograph or a manual tracing on an angle estimator grid overlay. The installer should keep documentation of the shading shown on the tool, the location of the tool on the array, and the shading obstructions that are indicated on the tool for the HERS Rater to verify the results.

Measurements shall be made at all the major corners of the array with no adjacent measurement being more than 40 feet apart. (See example in Figure D-5.) The points of measurement shall be distributed evenly between two major corners if they are more than 40 feet apart such that the linear distance between any sequential points is no more than 40 feet. However, if any linear edge of the array has no obstructions that are closer than two times the height they project above the closest point on the array, then the intermediate measurements along that edge do not need to be made. Measurements made at each major corner and

62 In the case of the mature heights of trees that are planted on the building lot or neighboring lots or planned to be planted as part of the landscaping or planned buildings or structures on the building lot or neighboring lots that are known to the applicant or building owner.

intermediate point shall be combined into a single data set and converted into an annual solar access percentage to be compared to the solar access entered into the FI Calculator. The HERS Rater shall ensure that the solar access noted in the FI Calculator is no higher than the solar access measured on site.

Figure D-5: Example of Points Where Measurement Shall Be Made Using a Solar Assessment Tool



Source: California Energy Commission

D. Verification of System Performance

The PV installer and HERS Rater must verify that the AC power output from the PV system is consistent with that predicted by the expected performance calculations. The FI Calculator will determine an estimate of system AC power output for a range of solar irradiance and ambient air temperature conditions and print a table on the NSHP FI-1 form. The calculations also include default adjustments for losses such as dirt, dust, and mismatched wiring. The values in the table are for an unshaded array. An example of the data that will be produced is shown in Figure D-6. The data in the table are specific to each PV system.

Verification of system performance must be performed after the PV system is installed and connected to the electricity grid. Measurements must be made with a minimum irradiance of 300 W/m² in a plane parallel to the array. The PV installer and/or the HERS Rater must 1) measure the solar irradiance in a plane parallel to the array, 2) measure the ambient air temperature, and 3) determine the expected AC power output for the measured field conditions from the table on the NSHP FI-1 form. The PV installer or the HERS Rater must then observe the AC power output displayed on the system performance meter (typically an inverter with a built-

in performance meter) and verify that the AC power output is equal to or greater than the amount shown in the table for the field-measured conditions. To qualify for incentives under NSHP, PV systems must have a stand-alone performance meter or an inverter with a built-in performance meter that measures AC power output.

The PV installer and HERS Rater must observe the AC power output on the system performance meter after waiting for a period of stable conditions during which the measured solar irradiance has stayed constant within ± 5 percent.

1. Measuring Solar Irradiance

Solar irradiance must be measured using an irradiance meter. When making this measurement, the PV installer or HERS Rater must place the irradiance meter on a plane that is parallel to the PV array. The PV installer should position the irradiance meter on top of the PV array or on the roof next to the PV array. If the HERS Rater does not have direct access to the roof, he or she must position the irradiance meter such that it is in full sun and is in a plane that is parallel to the PV array. Digital protractors or other instruments may be used to position the irradiance meter properly.

2. Measuring Ambient Air Temperature

Ambient air temperature must be measured with a digital thermometer in the shade. The instrument must have an accuracy of ± 2 degrees Fahrenheit.

3. Observing AC Power Output at the System Performance Meter

The PV installer and the HERS Rater must observe and record the AC power output reading from the system performance meter as soon as possible after measuring solar irradiance and ambient temperature. The inverter may cycle between multiple readings (total kWh, AC power output, and so forth), so the PV installer or HERS Rater will need to wait until the power is displayed and record this reading; several readings should be made to make sure that they are consistent and stable.

Figure D-6: Example Table of Expected AC Power Output From FI Calculator (in Watts)

Array #1 Field Verification Table

Example Calculator Run — Calculation Name

9/21/2016 — Calculation Date **9:56:07 AM** — Time

Irradiance (W/m²) \ Temperature (degrees Fahrenheit)	T = 15	T = 25	T = 35	T = 45	T = 55	T = 65	T = 75	T = 85	T = 95	T = 105	T = 115
300	568	568	546	524	524	502	481	481	459	437	437
325	612	612	590	568	568	546	524	524	502	481	481
350	677	655	633	612	612	590	568	546	546	524	502
375	721	699	677	677	655	633	612	590	590	568	546
400	765	743	721	721	699	677	655	633	612	590	590
425	808	786	786	765	743	721	699	677	655	633	612
450	874	852	830	808	786	765	743	721	699	677	655
475	917	896	874	852	830	808	786	765	743	721	699
500	961	939	917	896	874	852	830	808	786	743	721
525	1005	983	961	939	917	896	874	830	808	786	765
550	1049	1027	1005	983	961	939	896	874	852	830	808
575	1114	1070	1049	1027	1005	983	939	917	896	874	830
600	1158	1114	1092	1070	1049	1005	983	961	939	896	874
625	1201	1180	1136	1114	1092	1049	1027	1005	961	939	917
650	1245	1223	1180	1158	1136	1092	1070	1027	1005	983	939
675	1289	1267	1223	1201	1180	1136	1114	1070	1049	1005	983
700	1333	1311	1267	1245	1201	1180	1136	1114	1070	1049	1005
725	1376	1354	1311	1289	1245	1223	1180	1158	1114	1092	1049
750	1420	1398	1354	1333	1289	1267	1223	1180	1158	1114	1070
775	1485	1442	1398	1376	1333	1289	1267	1223	1180	1158	1114
800	1529	1485	1442	1420	1376	1333	1289	1267	1223	1180	1158
825	1573	1529	1485	1442	1420	1376	1333	1289	1267	1223	1180
850	1617	1573	1529	1485	1442	1420	1376	1333	1289	1245	1201
875	1660	1617	1573	1529	1485	1442	1420	1376	1333	1289	1245
900	1704	1660	1617	1573	1529	1485	1442	1398	1354	1311	1267
925	1726	1704	1660	1617	1573	1529	1485	1442	1398	1354	1311
950	1769	1726	1682	1638	1595	1551	1507	1464	1420	1376	1333
975	1813	1769	1726	1682	1638	1595	1551	1507	1464	1420	1376
1000	1857	1813	1769	1726	1682	1638	1595	1529	1485	1442	1398
1025	1966	1857	1813	1769	1704	1660	1617	1573	1529	1464	1420
1050	1966	1966	1835	1791	1748	1704	1660	1595	1551	1507	1442
1075	1966	1966	1879	1835	1791	1726	1682	1638	1573	1529	1485
1100	1966	1966	1966	1879	1813	1769	1726	1660	1617	1551	1507
1125	1966	1966	1966	1966	1857	1791	1748	1704	1638	1595	1529
1150	1966	1966	1966	1966	1879	1835	1769	1726	1660	1617	1551
1175	1966	1966	1966	1966	1966	1857	1813	1748	1704	1638	1595
1200	1966	1966	1966	1966	1966	1966	1835	1791	1726	1682	1617

Source: California Energy Commission

4. Multiple Orientation Arrays

Multiple orientation arrays are those with parallel strings, in different orientations (azimuth and tilt) and connected to the same inverter.[63] When parallel strings in different orientations are connected to the same inverter, solar irradiance must be measured separately in a plane parallel to each orientation and marked on the NSHP FI-2 and NSHP FI-3. The expected AC power output is determined separately for each orientation, and the sum is used for verification.

For example, a qualifying 3 kW PV system has 20 PV modules grouped evenly into two parallel strings of 10 modules each, one facing south with an azimuth of 170 degrees and one facing west with an azimuth of 260 degrees. The installer or HERS Rater evaluates system performance at 11:30 a.m. in March with an ambient temperature of 62 degrees Fahrenheit. The installer or HERS Rater measures 950 W/m² of solar irradiance in the plane parallel to the south string and 500 W/m² in a plane parallel to the west-facing string.[64]

The expected AC power output tables on the NSHP FI-1 indicate that Array 1 should be producing 1,586 W at 950 W/m², and Array 2 should be producing 900 W at 500 W/m² of solar irradiance. The expected AC power output is calculated as 2,486 W by summation of the expected AC power output for each orientation (1,586 W + 900 W = 2,486 W). This calculated value must be compared to the value displayed on the system performance meter for the entire system.

63 Substantial reductions in performance may result if there are different numbers of modules in each string or if modules with different orientations are connected in series.
64 When testing systems with multiple orientation arrays, the solar irradiance levels on all arrays must remain constant within ± 5 percent as discussed in Verification of System Performance above.

APPENDIX E:
NSHP FORMS

The following forms are included in the Guidebook for applicants to use as examples for their reservation and payment applications. Versions intended for form-entry are available for download in the online NSHP web tool application.

- Reservation Application Form (NSHP-1)
- Payment Claim Form (NSHP-2)
- Ten-Year Warranty and Cost Documentation Form (NSHP-3)
- Incentive Disclosure Affidavit
- NSHP Established Installer Reservation Form

The following forms are not included in the Guidebook and are either produced by the FI Calculator or provided by the solar energy system installer or HERS Rater:

- Flexible Installation Incentive Calculator Output Form (NSHP FI-1)
- FI PV Installation Form (NSHP FI-2)
- Alternative NSHP FI-2 for Established Installers (NSHP FI-2E)
- FI Field Verification and Diagnostic Testing Form (NSHP FI-3)
- Additional Energy Features Checklist (NSHP EE-3)

State of California **California Energy Commission**

NSHP-1

New Solar Homes Partnership Reservation Application Form

1. Applicant Information and Contact Information

Applicant Name (Homeowner or Homebuilder/Developer)	Applicant is: ☐ Homeowner ☐ Homebuilder	Phone Number	Email Address
Mailing Address	City	State	Zip Code
Primary Contact Name (if different from applicant)	Address	Phone Number	Email Address

2. General Project Information

Project Name: _____

Project Address (city and zip code for developments): _____

Occupancy Type: ☐ Single Family ☐ Multifamily ☐ Mixed-Use

Project Type:
☐ Solar as Standard (50% or more of the residential dwelling units will receive solar, minimum of six units)
☐ Solar Not as Standard (Less than 50% of the residential dwelling units will receive solar, minimum of six units)
☐ Small Development (One to five dwellings that will receive solar)
☐ Custom Home
☐ Affordable Housing

Total number of residential dwelling units in the project: _____

Total number of residential dwelling units with solar energy systems installed: _____

Total number of common area systems with solar energy systems installed: _____

System is located in a community identified as disadvantaged (receives a score of 76% or higher on CalEnviroScreen 2.0 Map at http://oehha.ca.gov/calenviroscreen/report/calenviroscreen-version-20)? _____YES _____NO

Building Energy Efficiency Standards project is subject to:
☐ 2016 (effective January 1, 2017) ☐ 2013 (effective July 1, 2014) ☐ 2008
Expected Energy Efficiency Level of Project (refer to Title 24 documentation [CF-1R or PERF-1])
☐ Code-Compliant (2013/2016 Energy Standards only) ☐ Tier I (2008/2013 Energy Standards only) ☐ Tier II (2008/2013 Energy Standards only)

Will this project be Virtually Net Energy Metered (VNM)? ☐ Yes (fill in below) ☐ No
☐ Residential Dwelling Units: _____%
☐ Common Areas: _____%

Electric utility providing electricity to project: ☐PG&E ☐ SCE ☐ SDG&E ☐ BVES
Project participating in electric utility new construction energy efficiency program (CAHP, CMFNH, Savings by Design): ☐ Yes ☐ No

3. Additional Project Information

Accessory Structures (**all** applicants)
1. Does the project contain additional buildings on the lot (guesthouse, cabana, etc.)? ☐ Yes, ____ buildings ☐ No
2. (If yes to previous): Do any of these buildings contain conditioned space? ☐ Yes, ____ buildings ☐ No
3. (If yes to previous): Are any of these buildings on the same utility meter as the main residence? ☐ Yes, ____ buildings ☐ No

Please initial the following:
I certify that the information entered above is correct: _____
I recognize that each building noted in #3 above must meet all NSHP energy efficiency requirements: _____

Permit Dates (For **Small Development and Custom Home** applicants only):
Anticipated or actual solar permit application date: _____
Anticipated or actual Certificate of Occupancy date: _____

Please initial the following:
I certify that, to the best of my knowledge, the above dates are correct: _____
I recognize that the my project will be ineligible if the solar permit is applied for more than 120 days after the issuance of the Certificate of Occupancy: _____

4. Solar Energy Systems Information

The system will be: ☐ Self-Installed* ☐ Installed by licensed contractor**

* For self-installed systems, provide either an equipment purchase agreement, or receipts/invoices showing at least 10% of the price or $1000 has been paid.
** For systems installed by a contractor, provide a copy of the installation contract.

System #1 Estimated NSHP Incentive (Attach Flexible Installation Calculator) _____

(If applicable) System #2 _____ System #3 _____ System #4 _____ System #5 _____

Declaration and Acknowledgements (all projects)	*Please initial the following:* I acknowledge that the NSHP incentive listed above is an estimate, and that the final specifications of the installed system will determine the final incentive. Applicant's Initials: _____ I acknowledge that in order to be eligible for NSHP incentives, the system components must be listed on the eligible equipment list, found at http://www.gosolarcalifornia.ca.gov/links/equipment_links.php. Applicant's Initials: _____

5. Declaration

The undersigned party declares under penalty of perjury that the information in this form and the supporting documentation submitted herewith is true and correct to the best of his or her knowledge and acknowledges the following program requirements to reserve funding:

Incentives are based on the expected performance of the systems installed. Systems that are leased or that provide electricity under a PPA are subject to special reporting requirements. The lessor or owner of the solar energy system must submit an annual status report on the operation of the solar energy system. If the lease agreement or PPA is terminated and the system is removed from the building upon which it was originally installed within ten years of the system's installation or the start date of the agreement, whichever is later, the lessor or system owner is responsible for the funding repayment.

The undersigned party further acknowledges that he or she is aware of the requirements and conditions of receiving funding under the New Solar Homes Partnership (NSHP) and agrees to comply with all such requirements and conditions as provided in the Energy Commission's *NSHP Guidebook, Tenth Edition*, and *Building Energy Efficiency Standards* (Title 24, Part 6) as a condition to receiving funding under the NSHP. The undersigned party authorizes the Energy Commission, during the term of the NSHP, to exchange information on this form with the applicable electric utility servicing the project to verify compliance with NSHP requirements.

6. Signature, Assignment of Administrative Rights and Incentive Recipient Information

(**Optiona**l)
I, the applicant, designate _____ as my authorized representative for the New Solar Homes Partnership program. This party is permitted to sign the NSHP-2(s) on my behalf. The authorized representative also has the authority to modify the payee prior to payment, or cancel the application.

Full Legal Name of the Designated Payee of the NSHP Incentive:

Payee's Address:

Builder/Developer's Representative or Homeowner Name (Applicant Name):	Title:
Applicant's Signature:	Date:

State of California | California Energy Commission

NSHP-2

New Solar Homes Partnership Payment Claim Form

[CEC use only]		
Payment Request = $ _____	***Reservation ID***	_____
Payment Approval Date: _____	***Project Name***	_____
Staff Member Initials: _____	***or Address***	_____
Project Name _____	***Site ID:***	_____

1. Confirmation of Reservation Amount

_____has been granted a reservation of $_____ for a ____ kW solar energy system. This reservation is for a _____ project and expires on ____. The system is being installed at _____. The payment will be made to _____ (designated payee).

The solar energy system must be installed prior to submitting the NSHP-2. Failure to meet these requirements will cause the payment of NSHP incentives to be delayed or withheld. The NSHP-2 form must be postmarked by the expiration date and all required supporting documentation must be submitted no later than 3 months or 90 calendar days, whichever is later, after the expiration date or the reservation will expire and the incentive amount will be forfeited. This reservation is non-transferable. System must be installed at the installation address.

2. System Details

Sales Arrangement: Purchased Leased PPA

Occupancy Permit Date: _____ Solar Permit Application Date: _____ Solar Permit Issue Date: _____

I certify that, to the best of my knowledge, the above dates are correct: _____

3. PV Modifications

Have any of the equipment or installation specifications changed since the reservation was approved? _ Yes _ No

If yes, note the changes before claiming payment.

_____

_____

4. Energy Efficiency Requirements and Modifications

Please indicate which document is being used to satisfy payment claim application requirements:

___ Certificate of Occupancy/Final Building Signoff **OR** ___ CF-4R's (HERS Registry Documents)

Have any of the measures used to meet the *Building Energy Efficiency Standards* or NSHP energy efficiency requirements changed since the reservation was approved? __ Yes __ No

If yes, note the changes before claiming payment.

_____

_____

_____

5. Payment Assignment

Is payment assigned to another party?

___ Yes (Please fill out all the sections below.)

___ No (Please skip Section 6 and complete all others.)

Assignment Request

I, _____, the applicant or authorized representative of the applicant as specified on the NSHP-1 form, hereby assign the right to receive payment for the above noted reservation under the NSHP to the following individual or entity and request that payment be forwarded to this individual or entity at the address below. A STD-204 must be submitted for the person/entity receiving the payment, if it is not already on record with the Energy Commission.

Name: _____

Address: _____

Phone Number:_____

As the applicant or authorized representative of the applicant as specified on the NSHP-1 form, I understand that I remain responsible for

complying with the requirements of the NSHP and will remain liable for any tax consequences associated with the reservation payment, despite the payment's assignment. I further understand that I may revoke this payment assignment at any time prior to the Energy Commission's processing of the payment by providing written notice to the Energy Commission's Renewable Energy Office.

Signature: _____
Name: _____
Date: _____
Title: _____

6. Declaration and Signature

The electrical generating system described above and in any attached documents meets the terms and conditions of the Energy Commission's NSHP, and has been installed as of the date stated below.
(2) The electrical generating system described above and in any attached documents is properly interconnected to the utility distribution
grid and has been issued utility approval to operate the system as interconnected to the distribution grid, or will receive utility approval to operate the system as interconnected to the distribution grid no later than 3 months or 90 calendar days, whichever is later, after the reservation expiration date.
(3) The rated electrical output of the generating system, the physical location of the system, and the equipment identified were installed as stated above in Sections 1-4.
(4) Except as noted above, there were no changes in the information previously submitted for this system.
The undersigned party further acknowledges that he or she is aware of the requirements and conditions of receiving funding under the NSHP, including the special reporting and repayment requirements for leased systems and systems providing electricity under a power purchase agreement, and agree to comply with all such requirements and conditions as provided in the Energy Commission's *NSHP Guidebook, Tenth Edition*, and the *Building Energy Efficiency Standards* (Title 24, Part 6) as a condition to receiving funding under the NSHP. If the system is leased or provides electricity through a power purchase agreement (PPA), the lessor or owner of the solar energy system must submit an annual status report on the operation of the solar energy system. If the lease agreement or PPA
is terminated and the system is removed from the building upon which it was originally installed within ten years of the system's installation or the start date of the agreement, whichever is later, the lessor or system owner is responsible for the funding repayment. As specified in the NSHP Guidebook, the undersigned applicant authorizes the Energy Commission during the term of the NSHP to exchange information on this form with the electric utility servicing the system in order to verify compliance with the NSHP requirements._____

Signature of Applicant/Authorized Representative

Name: _____ Title: _____
Signature: _____ Date: _____

State of California **California Energy Commission**

NSHP-3

New Solar Homes Partnership Ten-Year Warranty and System Cost Form

1. System Information

This warranty applies to the following _____ kW solar electric generation system
Equipment Description: _____
Located at: _____
Installation Cost: _____ Equipment Cost*: _____
Balance of System Cost: _____ Total Cost: _____

2. Warranty Coverage

This ten-year warranty is subject to the terms below (check one of the boxes):

□ **All components of the generating system AND the system's installation.** Said warrantor shall bear the full cost of diagnosis, repair, labor, and replacement of any system or system component, at no cost to the customer. Said warrantor also assumes coverage of the major system components in all situations where the manufacturer warranty does not cover the entire ten-year period; or

□ **System's installation only.** Said warrantor shall bear the full cost of diagnosis, repair, labor, and replacement of any system or system component, exclusive of the manufacturer's coverage, at no cost to the customer. Copies of manufacturer ten-year warranty certificates for the major system components (i.e. photovoltaic modules and inverter) MUST be provided with this form.

□ **Owner-builder or self-installed installation.** Warranty is inclusive only of the manufacturer's coverage. Copies of manufacturer ten-year warranty certificates for the major system components (i.e. photovoltaic modules and inverter) MUST be provided with this form. The owner-builder or self-installer assumes coverage of all other aspects of the ten- year warranty.

General Terms

This warranty extends to the original purchaser and to any subsequent purchasers or owners at the same location during the warranty period. For the purpose of this warranty, the terms "purchaser," "subsequent owner," and "purchase" include a lessee, assignee of a lease, and a lease transaction, or a host customer, assignee of a power purchase agreement, and a power purchase agreement. This warranty is effective from (date of completion of the system installation). A copy of this warranty is provided to the purchaser of the solar electric generating system.

Exclusions

This warranty does not apply to:

- Damage, malfunction, or degradation of electrical output caused by failure to properly operate or maintain the system in accordance with the printed instructions provided with the system.
- Damage, malfunction, or degradation of electrical output caused by any repair or replacement using a part or service not provided or authorized in writing by the warrantor.
- Damage malfunction, or degradation of electrical output resulting from purchaser or third party abuse, accident, alteration, improper use, negligence or vandalism, or from earthquake, fire, flood, or other acts of God.

3. Obtaining Warranty Service

Contact the following warrantor for service or instructions

Printed Name:	Company:
Address:	Phone: (_ _ _) _ _ _ - _ _ _ _
Signature of Warrantor's Legally Authorized Representative	Date

4. Additional System Warranty and Final Cost Information (For Large Projects)

The warranty information on page 1 of this form applies to the following systems in the same project with similar equipment descriptions located at:

1) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

2) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

3) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

4) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

5) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

6) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

7) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

8) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

9) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

10) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

11) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

12) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

13) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

14) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

15) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

16) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

17) _____ Warranty Effective Date: _____

Equipment Cost: _____ Install Cost: _____ B.O.S.: _____ Total Cost: = _____

B.O.S. = Balance of system cost

State of California | California Energy Commission

NSHP Incentive Disclosure Affidavit

New Solar Homes Partnership

1. Affidavit

Affidavit Ensuring a Realized Incentive Benefit to the End-Use Customer When Payee is the Installer, Equipment Seller, or Third-Party System Owner for the Purpose of Upholding Program Goals.

2. Declaration

By signing this affidavit, _____ ("Payee"), with respect to all solar electric systems within _____ (Project Name), for which funding by the New Solar Homes Partnership (NSHP) program is being sought under Application Number _____(Project ID), certifies and declares under penalty of perjury under the laws of the State of California that each of the statements in the paragraphs below are complete, true and correct for all sites within the project.

1) The Payee agrees that the final NSHP incentive amount, as determined by the California Energy Commission, shall be used to reduce either:

   a. The costs legally incurred by the end user for the purchase and installation of the solar energy system, when the system has been purchased by the end user, or:

   b. The lease payments or power purchase payments when the system is owned by a third party.

2) The Payee shall inform the end user in writing of the full amount of the final NSHP incentive, as determined by the California Energy Commission.

3) The Payee agrees that the California Energy Commission reserves the right to request further documentation that demonstrates that the incentive benefits will be passed to the end-user as provided in this affidavit.

Or, for affordable housing projects:

By signing this affidavit, _____ ("Payee"), with respect to all solar electric systems within _____ (Project Name), for which funding by the New Solar Homes Partnership (NSHP) program is being sought under Application Number _____(Project ID), certifies and declares under penalty of perjury under the laws of the State of California that each of the statements in the paragraphs below are complete, true and correct for all sites within the project.

1) The Payee agrees that the final NSHP incentive amount, as determined by the California Energy Commission, shall be used to reduce either:
   a. The costs legally incurred by the property owner for the purchase and installation of the solar energy system, when the system has been purchased by the property owner; or
   b. The lease payments or power purchase payments when the system is owned by a third party.
2) The Payee shall inform the property owner in writing of the full amount of the final NSHP incentive, as determined by the California Energy Commission.
3) The Payee agrees that the California Energy Commission reserves the right to request further documentation that demonstrates that the incentive benefits will be passed to the property owner as provided in this affidavit.

Please attach a list of specific site addresses that are covered by this attestation

3. Authorized Representative	
By signing this Affidavit, I certify that I am authorized to sign this Affidavit on behalf of the Payee. I declare under penalty of perjury, under the laws of the State of California, that all of the foregoing statements are true and correct. I agree to furnish a copy of supporting documents to the Energy Commission upon request.	
Printed Name:	Company:
Title:	
Signature of Payee's Legally Authorized Representative	Date

State of California | California Energy Commission

NSHP Established Installer Reservation Form

New Solar Homes Partnership

1. Lease or PPA Affidavit (Not Applicable for Purchased Systems)

Affidavit ensuring the inclusion of specific program requirements in the Legally Executed Lease or Power Purchase Agreement for the purpose of consumer protection in accordance with program goals.

The system(s) is/are financed under a: ☐ Lease Agreement ☐ Power Purchase Agreement

2. Declaration

By signing this affidavit, _____("System Owner"), with respect to the solar electric system project ("system") at _____ (Project Name), for which funding by the New Solar Homes Partnership (NSHP) program is being sought under Application Number _____(Project ID), certifies and declares under penalty of perjury under the laws of the State of California that each of the statements in the paragraphs below will be legally and contractually included or referenced in the lease or power purchase agreement for all applicable sites within the system.

- The initial term of the agreement is at least ten years.
- At the end of the initial term, the lessee or end-use customer must be provided with the option to have the system removed from their home at the cost of the lessor or system owner. Any other options at the end of the term must be clearly described.
- If the agreement is terminated and the system is removed from the home within the first ten years of the agreement, the Energy Commission may require the repayment of some or all of the NSHP incentive. The lessor or system owner will be responsible for the repayment to the Energy Commission.
- The amount of the NSHP incentive, as determined by the California Energy Commission, and the amount by which the NSHP incentive will reduce the payment made by the lessee or end-use customer under the agreement.

Please attach a list of specific site addresses that are covered by this attestation.

3. Authorized Representative

By signing this Affidavit, I certify that I am authorized to sign this Affidavit on behalf of the System Owner. I declare under penalty of perjury, under the laws of the State of California, that a lease agreement or PPA has been executed for the system listed above and that the system information listed above and the site information attached are true and correct. Furthermore, I declare that the above NSHP requirements are incorporated within the executed agreement. I agree to furnish a copy of the executed agreement to the Energy Commission upon request.

Printed Name:	Company:
Title:	
Signature of System Owner's Legally Authorized Representative	Date