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California Energy Commission

STAFF REPORT

New Solar Homes Partnership Program Annual Progress Report

(January 1–December 31, 2016)

California Energy Commission

Edmund G. Brown Jr., Governor

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California Energy Commission

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ABSTRACT

The New Solar Homes Partnership (NSHP) Program is integral to California's continuing efforts to promote and develop clean, renewable electricity generation. This report provides an update on key NSHP program statistics, including program status and activity for market-rate and affordable housing projects for the past year, geographical and income distribution of NSHP incentives, available funds for incentives, and annual trends. This report is produced in response to the June 9, 2016, approved CPUC Decision 16-06-006, "Decision Funding Authorizations and Related Measures for Continuation of the New Solar Homes Partnership Program."

Keywords: New Solar Homes Partnership, NSHP, Energy Commission, California Public Utilities Commission, CPUC, Decision 16-06-006, market-rate, affordable housing

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CHAPTER 1:
2016 Year in Review

Senate Bill 1 (Murray, Chapter 132, Statutes of 2006) (SB 1) established the California Solar Initiative (CSI) with three goals (1) installing solar energy systems with a generating capacity equivalent to 3,000 megawatts (MW), (2) establishing a self-sufficient solar industry within 10 years, and (3) placing solar energy systems on 50 percent of new California homes by 2020. The CSI is being implemented by the California Energy Commission (Energy Commission), the California Public Utilities Commission (CPUC), and the state's local publicly owned electric utilities in different programs that share the same broad goals.[1]

The New Solar Homes Partnership (NSHP) program is the Energy Commission's component of the CSI and is limited to new home construction located in investor-owned utility (IOU) service territories. Launched in January 2007, the program provides financial incentives for homeowners, builders, and developers to include solar energy systems on new, energy-efficient homes that will contribute to the CSI goals. The NSHP goal under the CSI is 360 MW of installed solar capacity. The NSHP program was launched as a ten year program, with an authorized end date of December 31, 2016.

Program Extension and Additional Funding

The NSHP program is now subject to new statutory deadlines for encumbering and disbursing funds as a result of Senate Bill 83 (SB 83, Committee of Fiscal and Budget Review, Chapter 24, Statutes of 2015). SB 83 requires any funding made available for incentives under NSHP to be encumbered through the issuance of rebate reservations by no later than June 1, 2018 and disbursed no later than December 31, 2021.

Although NSHP was established by SB 1 as a $400 million program under the CSI, the program relied on moneys that were allocated to the Energy Commission's Emerging Renewables Program and totaled approximately $282 million through 2011. On November 13, 2015, the Energy Commission requested the CPUC to continue the NSHP program pursuant to Public Utilities Code section 2851 (e)(3).

The CPUC approved Decision 16-06-006,[2] on June 9, 2016, requiring the Investor Owned Utilities (IOUs)[3] to provide $111.78 million in funding for the continuation of the NSHP

1 As of July 12, 2016, the residential CSI Program for solar photovoltaic systems has closed for residential customers of all investor-owned utilities and is no longer accepting applications. The CSI program has also closed for nonresidential customers of Pacific Gas and Electric Company and San Diego Gas & Electric Company.

2 Decision 16-06-006 is available from CPUC's website at:
http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DoclD=163266780

3 Pacific Gas and Electric, Southern California Edison Company, and San Diego Gas and Electric

program. The CPUC Decision also designates the Energy Commission to serve as program administrator, and establishes administrative and oversight related requirements for the continuation of the NSHP program.

Pursuant to the requirements of CPUC Decision 16-06-006, the Energy Commission held a workshop on July 8, 2017, to consider information from industry experts, stakeholders, and the general public on the following program-related issues:

- Re-assess NSHP incentive levels to maximize ratepayer value
- Ameliorate the principal-agent market failure in the new homes market
- Consider improvements to the affordable housing component of NSHP; and
- Discuss a possible plan for Measurement and Evaluation metrics for the NSHP program, with at minimum, impact evaluation and cost effectiveness studies.

The information and comments solicited at this workshop are being used to ensure that the program design for NSHP addresses current market conditions in the solar photovoltaic and new construction industries.

Program Recognition

The Clean Energy States Alliance (CESA) is a national, nonprofit coalition of public agencies and organizations that works with state leaders, federal agencies, industry representatives, and other stakeholders to develop and promote clean energy technologies. In June 2016, CESA announced the recipients of the 2016 State Leadership in Clean Energy (SLICE) awards. The NSHP program was recognized as one of six state and municipal programs and projects that demonstrate leadership, effectiveness and innovation in advancing renewable energy and other clean energy technologies. Winners were chosen by an independent panel of five distinguished judges.

Affordable Housing Project Spotlight

The Energy Commission recognizes the importance of ensuring that low-income ratepayers who contribute to NSHP's funding have equitable access to the program. Thus, higher incentives are available for eligible affordable housing projects. In February 2016, the Mutual Housing at Spring Lake subdivision community received incentives through the NSHP program for a 209 kW solar energy system. This was the nation's first certified 100 perfect zero-net-energy (ZNE) rental housing community. It features 62 apartment flats and townhouses, with 61 of the units designated as income –restricted affordable units targeted toward agricultural workers and their families.

Along with the large PV system, this project includes other features that contribute toward making it community grid-neutral. Features include advanced energy efficiency devices, as well as water-saving technologies such as low-flow toilets, advanced

showerheads that restrict water flow while the water warms to the desired temperature, and drought-tolerant landscaping.[4] To encourage participation by similar projects, Energy Commission staff intends to streamline affordable housing eligibility requirements to ease some of the NSHP program participation burden, as well as to promote solar in Disadvantaged Communities.

Program Progress Reports

The CPUC's decision directs the Energy Commission to submit quarterly and annual reports to the CPUC detailing program status and other various activities that are discussed in the following chapters. Three quarterly reports were issued in 2016 and are available at http://www.gosolarcalifornia.ca.gov/documents/nshp.php. This annual report covers the period, January 1, 2016, to December 31, 2016, and fulfills the initial annual reporting requirement.

4 Mutual Housing at Spring Lake. Mutual Housing California. Accessed December 29, 2016. http://www.mutualhousing.com/yolo-communities/spring-lake/

CHAPTER 2:
Program Status and Activity for all Project Types

Reservation Applications

Participation in the NSHP program is a two-step process in which applicants 1) reserve funding for a project in advance and 2) receive an incentive payment upon completion of the project. Funding is secured through reservation applications that applicants submit to the Energy Commission. Once the reservation application is approved, applicants have the reservation period to complete their project, which includes finishing construction of the home, installing the solar energy system and interconnecting with the utility grid, completing third-party field verifications, and submitting a payment claim package to the Energy Commission.

Reservation applications are approved based on the date they were submitted and funding is reserved for either an 18- or 36-month reservation period, depending on the project type. Large development projects are developments of six or more residential units with solar on 50 percent or more of the dwelling units and receive a 36-month reservation period. Affordable housing projects, which include residential unit projects and common area projects in which at least 20 percent of the units are subject to income restrictions by a qualifying regulatory agreement, also receive a 36-month reservation period. Other projects include small developments of fewer than six residential units, projects where solar will be installed on less than 50 percent of the residential units ("Solar Not As a Standard"), and market-rate common areas. Other projects and custom home projects receive an 18-month reservation period. Depending on the project type, reservation applications may cover a single system (e.g., a custom home) or multiple systems (e.g., large developments).

During year 2016, reservation applications for 17,566 systems were approved, corresponding to more than 68 MW of capacity and $40.1 million in reserved funding. Table 1 below shows the breakdown of systems in reservation applications that were approved from January 1, 2016, through December 31, 2016. Large developments accounted for roughly 94 percent of reserved systems, 92 percent of reserved capacity, and 88 percent of reserved funding. Affordable housing systems accounted for less than 1 percent of reserved systems. These systems are often virtual net energy metered[5] and serve multiple units and/or common areas, so the total number of systems is lower than the number of residential units served directly or indirectly (in the case of common area

5 *Virtual net energy metering* is a tariff arrangement that allows a property owner to allocate credits from a single solar energy system to multiple units, in which each has an electric meter.

projects) by the solar energy system. Altogether, affordable housing systems corresponded to 2 percent of reserved capacity and 5 percent of reserved funding over the year.

Table 1: Reservation Applications Approved From January Through December

Project Type	# of Systems	Encumbrances	Capacity (kW AC)
Large Developments*	16,540	$ 35,311,730	62,473
Affordable Housing	58	$ 2,142,395	1,458
Custom Homes	110	$ 518,105	818
Solar Not As a Standard	815	$ 1,838,212	2,990
Other	43	$ 313,826	476
Totals	**17,566**	**$ 40,124,268**	**68,215**

Source: California Energy Commission

The majority of reserved subdivision projects (which include the project types of large development and solar not as a standard) demonstrated a commitment through an installation contract by builders to install solar on at least 50 percent of the units in the project. Table 2 shows the number of approved applications for subdivisions with at least 6 units and the total number of systems included in these applications. Of the 304 projects represented in reservation applications, 90 percent were approved as large development projects, which required solar on at least 50 percent of units. Subdivision project reservation applications included a combined a total of 17,355 systems, 95 percent in large developments and 5 percent in solar not as standard projects. Solar Not as a Standard is a project type within NSHP that describes projects where solar will be installed on less than 50 percent of the residential units in the development. This category of projects was not reflected in previous reports, but is reflected now to illustrate the overwhelming amount of builders installing solar above the 50 percent mark, as seen in the large development category. Due to the low number of Solar Not as a Standard applications submitted to the program, updating this information will be limited to NSHP Annual Reports.

Table 2: Subdivision Applications Approved From January Through December

Project Type	# of Applications	# of Systems
Large Developments	273	16,540
Solar Not As a Standard	31	815
Totals	**304**	**17,355**

Source: California Energy Commission

Payment Claims

To receive the NSHP incentive payment, the solar energy system must be completely installed, grid-connected, operate satisfactorily, and the building must comply with the energy efficiency specifications proposed in the applicant's reservation.

Table 3 displays the number of payment claims approved in 2016. Similar to approved reservations, the majority of approved payment claims were for systems in large developments (80 percent), which corresponded to 68 percent of installed capacity and 62 percent of paid incentives. Affordable housing payments accounted for nearly 1 percent of approved payment claims, 8 percent of installed capacity and 12 percent of paid incentives. In addition to the project types identified in the previous section, some of the payment claims belong to project types that are no longer available for new reservation applications, which have been included in the "Other" project category.[6] In total, payment claims were approved for 6,215 systems, corresponding to more than 20 MW of installed capacity and $21.1 million in incentives.

Table 3: Payment Claims Approved From January Through December

Project Type	# of Systems	Incentive Amount	Capacity (kW AC)
Large Developments*	4,949	$ 13,045,259	13,943
Affordable Housing	55	$ 2,581,133	1,642
Custom Homes	216	$ 1,371,278	1,582
Solar Not As a Standard*	139	$ 529,662	529
Other*	995	$ 4,092,580	3,203
Totals	**6,215**	**$ 21,090,250**	**20,370**

*The "Large Development" and "Solar Not as a Standard" project types were introduced in the NSHP Guidebook, 7th Edition; thus, only payment claims approved that were subject to the 7th and later editions are reflected in these categories. However, similar or equivalent project types existed under different names in previous editions of the *NSHP Guidebook*. Payment claims approved during 2016 under these previous project types are reflected in the "Other" category.

Source: California Energy Commission

Energy Efficiency Level of Approved Payment Claims

Under the *NSHP Guidebook,* the program offers three incentive tiers for different levels of energy efficiency: "code-compliant," where the new home is between 0 and 14.9 percent better than the current[7] *Title 24 Building Energy Efficiency Standards* (*Title 24 Standards*); "Tier I," where the structure exceeds the energy efficiency standard between

6 These project types include: Solar as a Standard, Solar as an Option, and Base Incentive (an early version of projects where solar was not installed as a standard feature).
7 "Current" refers to the update to Title 24, part 6, in effect at the time the building permit for the new residential construction is submitted to the local jurisdiction.

15 and 29.9 percent; and "Tier II," where the structure exceeds the standard by 30 percent or more (along with 30 percent beyond the standard for cooling).

When the NSHP program began, incentives were available only for systems installed on new homes that exceeded the then current *Title 24 Standards* by at least 15 percent (Tier I) or 30 percent (Tier II), with an additional 30 percent improvement in space cooling for Tier II. To address the more stringent requirements of the *2013 Title 24 Standards*, the NSHP program began offering a code-compliant incentive for homes subject to the 2013 update of the *Title 24 Standards* (*2013 Energy Standards*) as long as the home met code requirements before claiming any efficiency compliance credit for the solar energy system.

Table 4 shows the breakdown of energy efficiency level of all payment applications approved during 2016. Code -compliant applications account for 47 percent of approved payments, followed by Tier I applications (44 percent). Tier II applications accounted for only 9 percent of approved systems.

Table 4: Energy Efficiency Levels of Affordable Housing Payment Claims Approved From January Through December

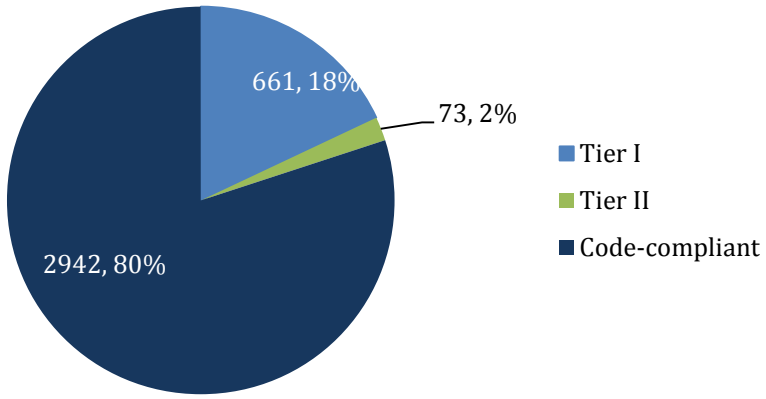
Energy Efficiency Level	# of Systems	Incentive Amount	Capacity (kW)
Code Compliant	2,946	$ 6,908,562	8,558
Tier I	2,716	$ 10,247,812	9,138
Tier II	553	$ 3,933,876	2,673
Totals	**6,215**	**$ 21,090,250**	**20,370**

Source: California Energy Commission

Of these approved payment claims, 59 percent (3,676 systems) were installed on new buildings subject to the *2013 Energy Standards* and 41 percent (2,538 systems) on buildings permitted under the 2008 update to the *Title 24 Standards* (*2008 Energy Standards*).[8]

8 One approved application was installed on a building permitted under the *2005 Standards*.

Figure 1: Installed Systems by Energy Efficiency Level, *2013 Energy Standards* Only (Approved January Through December)

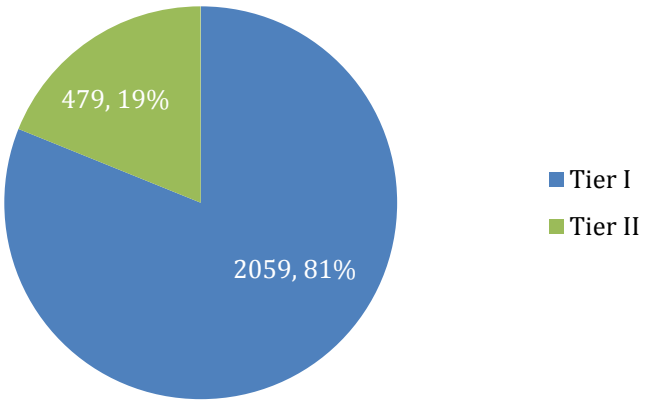


Source: California Energy Commission

Figure 1 shows the breakdown of energy efficiency level for the payments approved in 2016 for only projects subject to the *2013 Energy Standards*. For these payments, 71 percent qualified for the code-compliant energy efficiency level, with 18 percent achieving Tier I and 2 percent achieving Tier II.

Figure 2 shows a similar energy efficiency level breakdown for approved payments subject to the *2008 Energy Standards*, which are not eligible for a code-compliant efficiency tier. For these projects, 81 percent of approved payments met the Tier I energy efficiency requirements and 19 percent achieved those of Tier II.

Figure 2: Installed Systems by Energy Efficiency Level, *2008 Energy Standards* Only (Approved January Through December)



Source: California Energy Commission

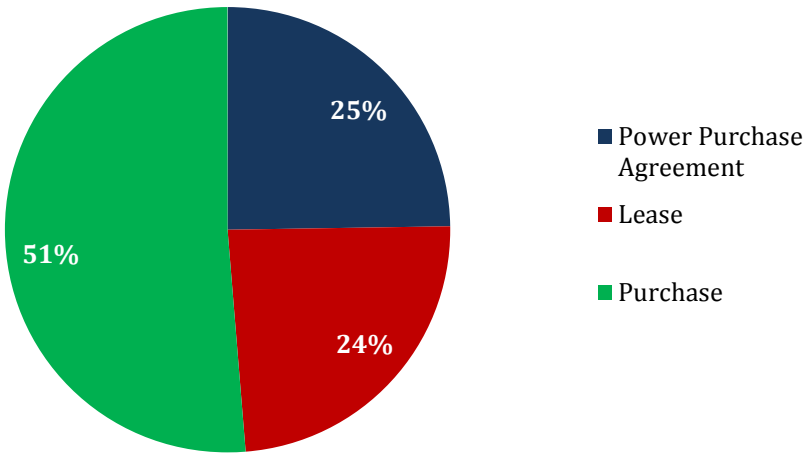
Although projects subject to the *2013 Energy Standards* may qualify for NSHP without achieving the minimum 15 percent compliance margin required of projects subject to the *2008 Energy Standards*, these code-compliant homes are not necessarily less efficient than earlier projects, as the *2013 Energy Standards* are roughly 25 percent more energy-efficient relative to the *2008 Energy Standards*. Relative to the 2005 update to the *Title 24 Standards*, which was effective during the launch of the NSHP program, the *2013 Energy Standards* are estimated to be 40 percent more energy efficient.

System Ownership of Approved Payment Claims

NSHP systems may be owned either by the end-use customer or by a third-party, provided that the lease or power purchase agreement (PPA) executed by the end-use customer and third-party meets certain requirements in the *NSHP Guidebook*. These requirements include an initial term of at least 10 years, the option for the end-user to have the system removed at no cost at the end of the term, and demonstrating the benefit of the NSHP incentive to the end-user.

For payments approved in 2016, the sales arrangement for the PV system was nearly split between direct purchases (51 percent) and third-party financed systems (49 percent). Within the third-party owned systems, 51 percent (25 percent overall) were PPAs and 49 percent (24 percent overall) were leases.

Figure 3: Sales Arrangement for Installed Systems (Approved January Through December)



Source: California Energy Commission

Applications and Claims Submitted and Processed

Table 5 shows the total number of reservation applications and payment claims submitted and reviewed from January 1 through December 31, 2016. The 527 reservation applications submitted accounted for 17,646 systems, totaling 69.3 MW. The 17,646 systems submitted during 2016 represent a 15 percent increase over the 15,360 systems that were submitted during the previous year. The total capacity of 69.3 MW submitted during this year represents a 34 percent increase over the 51.7 MW that was submitted during the previous year.

Table 5: Number of Reservations and Payment Claims Submitted and Reviewed (January Through December)

	Submitted	Reviewed
Reservations	527	561
Payments	6,940	6,038

Source: California Energy Commission

There could be several possible factors contributing to this growth in NSHP activity, including the improved state of the new housing market, expanded program eligibility through the code-compliant tier for projects permitted under the *2013 Energy Standards*, and an increase in the number of applications received prior to the anticipated incentive level drop which occurred in October. However, with the adoption of the NSHP Guidebook at the Energy Commission's March 8 Business Meeting, the incentive structures were modified to remove the last two levels, which brings the market rate incentive back to level 8.

CHAPTER 3:
Other Program Reporting

This chapter contains data that covers the previous years of the NSHP program, as noted, as well as data from January 1, 2016 through December 31, 2016.

Geographic Distribution

The NSHP program has paid incentives to systems located in 51 out of California's 58 counties. Table 6 displays data on total NSHP installations, total incentives paid, total capacity, and mean system size by county for systems installed over the life of the program through December 31, 2016. Some counties, including Del Norte, Modoc and Sacramento, do not have data either because they have no projects installed through the NSHP program, or they are not located within an eligible IOU territory and are ineligible to participate in the NSHP program.

Table 6: NSHP Installations by County (All Years)

County	Number of NSHP Systems	Total Incentive Amount Paid	Total Capacity Installed	Mean System Size (kW AC)
Alameda	560	$5,597,447	2,367.05	4.23
Alpine	0	$0	0	N/A
Amador	7	$65,058	33.90	4.84
Butte	112	$876,035	500.10	4.47
Calaveras	15	$175,719	70.86	4.72
Colusa	2	$31,448	11.19	5.59
Contra Costa	1,281	$7,284,967	3,880.95	3.03
Del Norte	0	$0	0	N/A
El Dorado	996	$4,996,559	2,631.45	2.64
Fresno	1,653	$8,272,485	4,741.31	2.87
Glenn*	15	$581,560	189.64	12.64
Humboldt	47	$973,608	464.20	9.88
Imperial	1	$8,626	5.32	5.32
Inyo	3	$39,502	17.05	5.68
Kern	640	$4,218,320	2,636.11	4.12
Kings	276	$1,522,715	701.90	2.54
Lake	20	$255,068	151.77	7.59
Lassen	1	$12,653	4.60	4.60
Los Angeles	3,464	$15,100,365	7,821.75	2.26
Madera	16	$286,520	158.21	9.89
Marin	45	$459,198	235.99	5.24

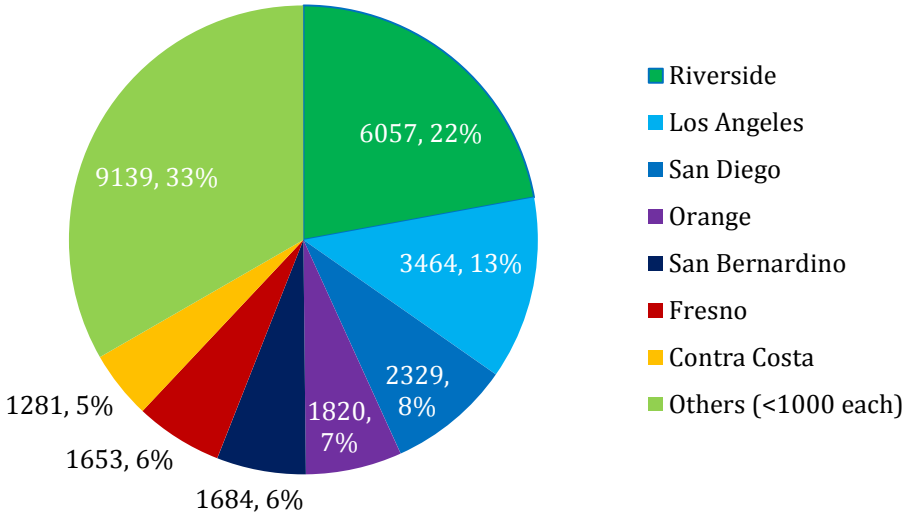
Mariposa	3	$61,736	24.47	8.16
Mendocino*	10	$246,449	133.91	13.39
Merced*	3	$30,343	31.77	10.59
Modoc	0	$0	0	N/A
Mono	4	$35,086	23.12	5.78
Monterey	190	$2,261,625	1,058.15	5.57
Napa*	27	$612,128	362.45	13.42
Nevada	46	$372,298	199.93	4.35
Orange	1,820	$6,752,265	4,352.03	2.39
Placer	839	$4,317,088	2,322.10	2.77
Plumas	13	$55,557	31.55	2.43
Riverside	6,057	$24,066,694	15,192.23	2.51
Sacramento	0	$0	0	N/A
San Benito*	8	$805,825	259.77	32.47
San Bernardino	1,684	$5,824,593	4,248.62	2.52
San Diego	2,329	$20,785,600	9,763.71	4.19
San Francisco	91	$1,994,202	723.99	7.96
San Joaquin	366	$2,264,808	882.24	2.41
San Luis Obispo	577	$3,707,787	2,177.01	3.77
San Mateo	103	$1,457,937	841.80	8.17
Santa Barbara	244	$1,948,522	977.45	4.01
Santa Clara	888	$6,425,870	3,614.56	4.07
Santa Cruz	109	$810,969	466.73	4.28
Shasta	34	$348,010	190.35	5.60
Sierra	0	$0	0	N/A
Siskiyou	0	$0	0	N/A
Solano	875	$5,126,913	2,992.51	3.42
Sonoma	198	$1,530,470	773.11	3.90
Stanislaus*	6	$261,066	108.13	18.02
Sutter	20	$286,119	144.92	7.25
Tehama	1	$12,351	4.53	4.53
Trinity	0	$0	0	N/A
Tulare	436	$3,261,491	1,643.09	3.77
Tuolumne	16	$234,650	102.96	6.44
Ventura	249	$2,170,903	1,018.10	4.09
Yolo	944	$11,700,442	4,829.66	5.12
Yuba	83	$481,299	195.13	2.35

*Due to the relatively small number of systems in this county, the presence of multifamily or common area projects with large system sizes may disproportionately alter the mean system size.

Source: California Energy Commission

Although most of California's counties have seen some NSHP activity, a handful of counties account for the majority of installations. Figure 4 shows the individual share of NSHP installations for counties with at least 1000 systems and the combined share of all other counties. Riverside County makes up 22 percent of all installed NSHP systems, followed by Los Angeles County (13 percent) and San Diego (8 percent). Of the seven counties with at least 1,000 NSHP installations approved as of December 31, 2016, five are located in Southern California.

Figure 4: NSHP Installation Share by County



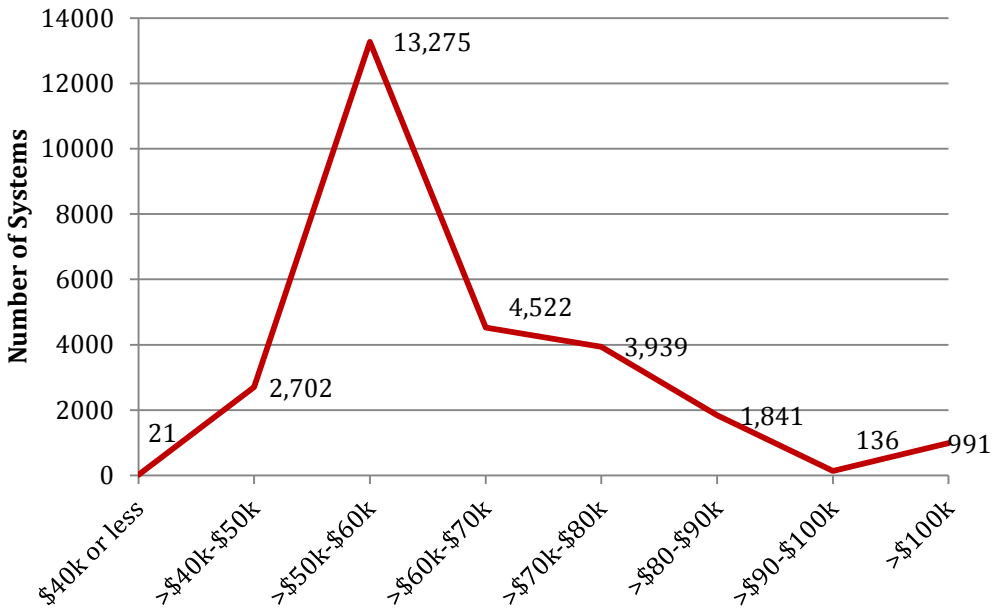
Source: California Energy Commission

Income Distribution

The NSHP program has funded systems in all corners of the state, in areas with varying financial means. In Figure 5, all installed NSHP systems are grouped according to the median household income of the U.S. zip code in which they are located. Note that the Energy Commission does not collect information on income levels of applicants or homeowners.

Nearly half of installed NSHP systems are located in communities with a mean household income between $50,000 and $60,000. Approximately 10 percent have been installed in communities with a mean household income between $40,000 and $50,000, and 21 systems have been installed in communities with a mean income below $40,000.

Figure 5: NSHP Installations by Median Income (Zip Code)



Source: U.S. Census Bureau; "Small Area Income and Poverty Estimates"; generated by California Energy Commission using State and County Estimates for 2015, January 1, 2017.
<https://www.census.gov/did/www/saipe/data/statecounty/data/2015.html >

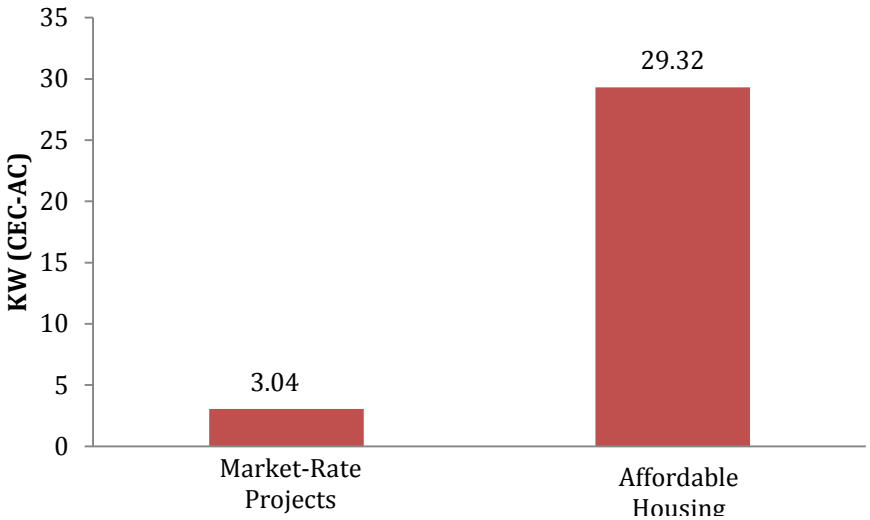
System Size

Figure 6 shows the mean system size for market-rate and affordable housing projects with approved payments in 2016. For market-rate projects, the mean system size was 3.04 kW AC; for affordable housing projects, 29.32 kW AC.[9]

The system size for NSHP affordable housing projects is typically larger because these often include a single virtual net-metered system (as opposed to individual systems for each unit) and/or systems serving common area load, which tend to be much larger than systems serving individual single-family homes. For both market-rate and affordable housing, the maximum system size is 7.5 kW AC per residential unit. Systems serving common area load may be larger if the need is demonstrated.

9 Due to the small number of affordable housing projects, the mean size can be easily biased by individual projects.

Figure 6: Mean Installed System Size

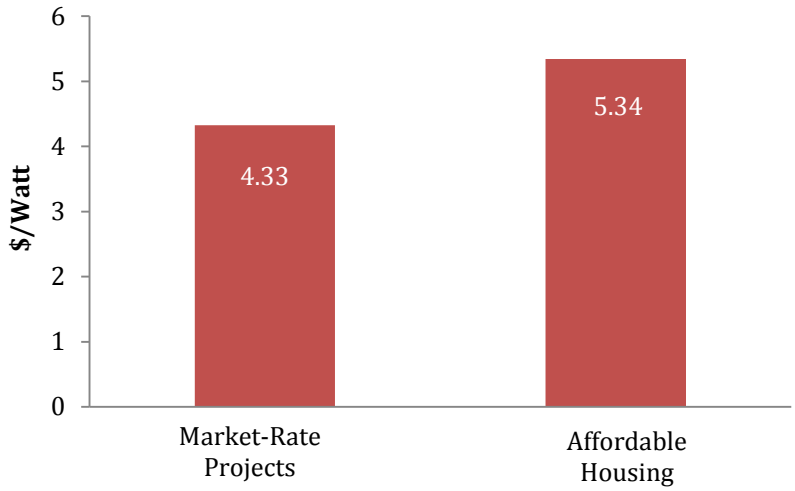


Source: California Energy Commission

Reported Costs and NSHP Incentive Amounts

The NSHP program has required applications to report gross system cost information (hardware, installation, and balance of system), excluding the NSHP incentive and any discounts, for several years. Please note that this data is based upon costs that are self-reported by program participants and therefore vary not only based upon the particular financial arrangement of each site (purchase, lease or PPA), but also due to differences in cost reporting among sellers and installers.

Figure 7: Annual Mean Reported Cost per Watt CEC-AC



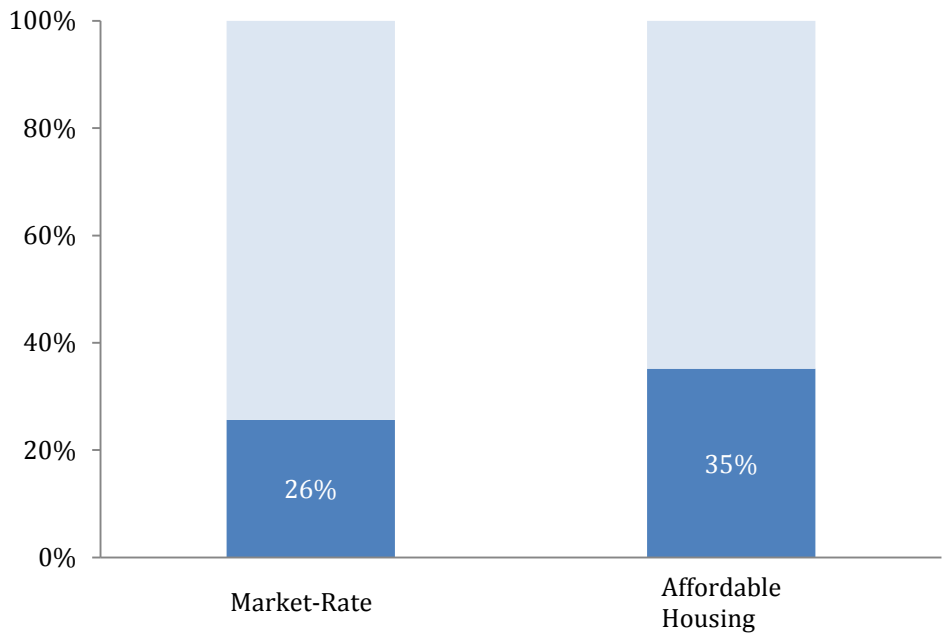
Source: California Energy Commission

Figure 7 shows the mean reported final system cost per watt (CEC-AC) for approved payments for both affordable housing and other projects. The cost per watt was derived by dividing the reported total system cost by the CEC-AC system size for each system with cost data available and taking a simple average based on the applications approved in a given year.

For market-rate projects with payments approved in 2016, the mean reported cost per installed watt was $4.32/watt; for affordable housing projects, $5.34/watt. Given the smaller sample size of affordable housing projects, some of the cost difference could be due to effects from individual, high-cost projects. It may also be related to higher costs incurred by certain affordable housing projects, such as prevailing wage requirements.

The NSHP program limits the final incentive amount to 50 percent of the total system cost (net any discounts) for market-rate projects and to 75 percent of the total cost for affordable housing projects. Figure 8 shows the mean percentage of the total cost covered by the NSHP incentive for market-rate and affordable housing projects, respectively. The mean share was derived by dividing the paid NSHP incentive amount by the reported system cost and taking a simple average across systems approved in 2016.

Figure 8: Mean Share of NSHP Incentive in Reported Total System Cost



Source: California Energy Commission

For market-rate projects, the mean NSHP incentive share was 26 percent in 2016. For affordable housing projects, the mean incentive share was 35 percent in 2016. Although NSHP affordable housing projects reported a higher gross cost per watt, as seen in

Figure 7, the higher incentive share of the cost is likely related to the higher incentive rates available for qualifying affordable housing projects.

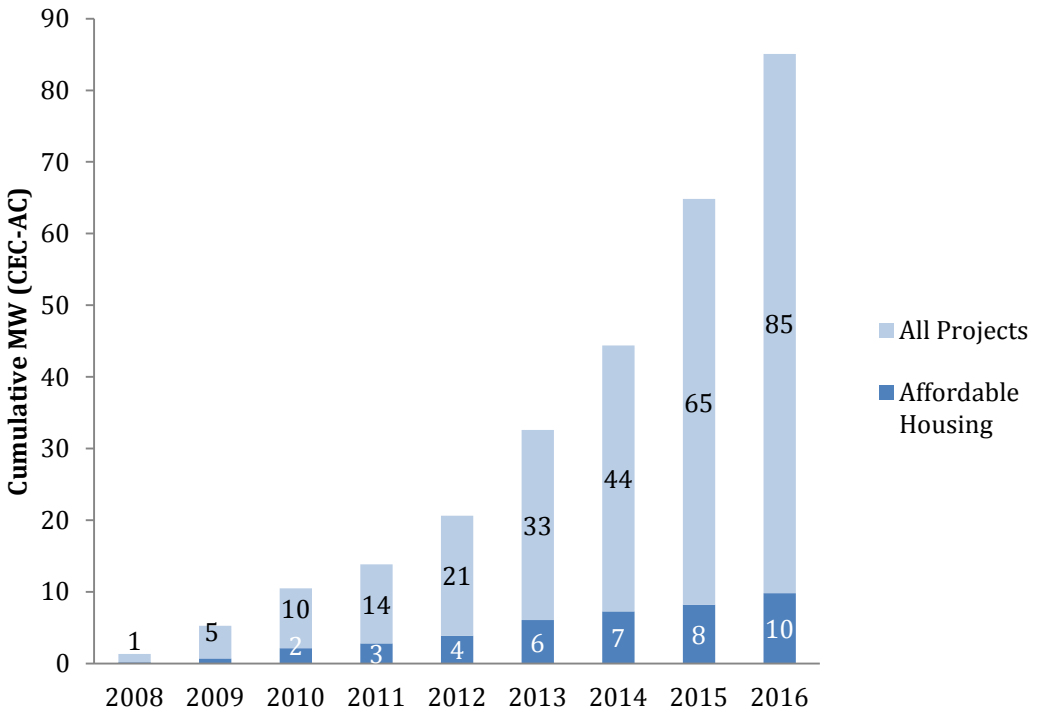
Overall Progress Toward Meeting Program Goals

The overall NSHP program goal is to install 360 MW of solar energy generation on new residential housing by the end of the program. As of December 31, 2016, approved NSHP payment claims had supported the installation of 85.1 MW.

Figure 9 shows the cumulative generation capacity installed for all projects receiving NSHP incentives, including affordable housing, and for affordable housing alone. Of the 85.1 MW of capacity installed by the end of 2016, 10 MW was installed on affordable housing projects, which represents approximately 12 percent of all installed capacity.

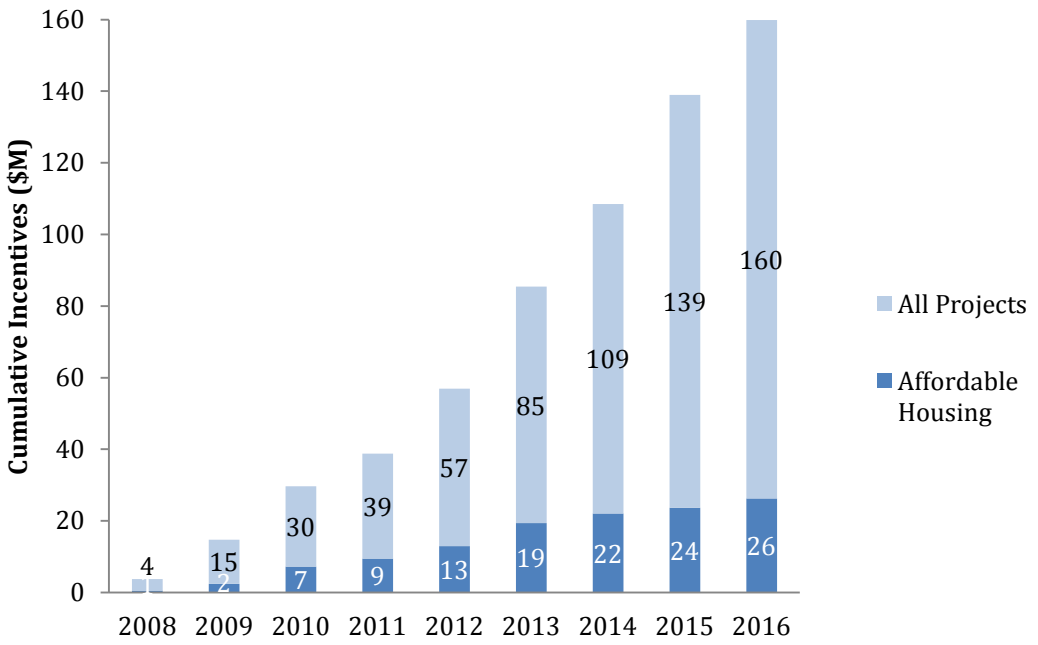
Figure 10 shows the total amount of NSHP incentives paid over time. As of December 31, 2016, approximately $160 million in NSHP incentives have been paid , $26 million of which funded affordable housing projects.

Figure 9: Cumulative Capacity Installed (All Years)



Source: California Energy Commission

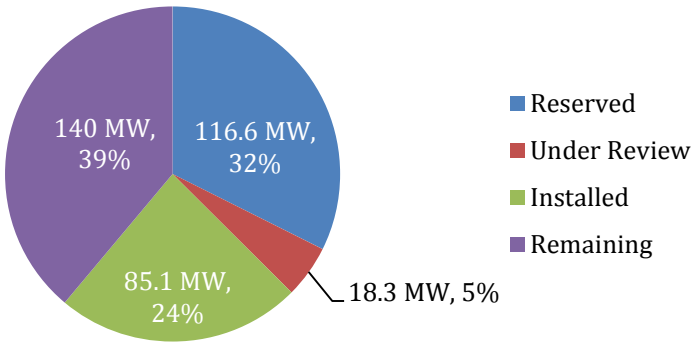
Figure 10: Cumulative Incentives Paid (All Years)



Source: California Energy Commission

As shown in Figure 11, NSHP has reserved funds for or installed 56 percent of the total capacity goal for the program. In addition, applications for systems corresponding to 5 percent of the overall capacity goal are under review by the Energy Commission. An additional 116.6 MW are expected to be installed under approved reservations, and another 18.3 MW are represented in reservation applications that are under review. Assuming all capacity under review is approved and installed, 39 percent of the overall program capacity goal remains for newly submitted applications.

Figure 11: Progress Toward NSHP MW Goal



Source: California Energy Commission

CHAPTER 4:
Budget Reporting

Current data show that as of December 31 2016, available funding remaining out of the initial allocated amount of $282 million, is approximately $30.2 million, with reservation applications totaling $13.5 million under review, leaving around $16.7 million available for new applications under the initial program funding. The available funding may include disencumbrances from previously reserved projects that have since expired or withdrawn from the program. In future reporting periods, the NSHP budget reporting will reflect the availability, encumbrance, and disbursement of additional funds authorized by CPUC Decision 16-06-006, as appropriate.

Table 7: Total Expenditures

	$ (Millions)	MW (AC)
Available Funding	30.2	
Under Review	13.5	18.3
Remaining Funding	16.7	

Source: California Energy Commission

CHAPTER 5:
Conclusion and Outlook

The NSHP program saw significant program activity during 2016, with new reservation applications submitted for 17,646 systems totaling 69.3 MW of capacity. During this period, the program reserved $40.1 million in funding for more than 68 MW of new solar capacity and paid $21.1 million in incentives for more than 20 MW of installed systems.

The reservation and payment applications approved in 2016 were dominated by the large development project type. Within this project type, two thirds of approved reservation applications indicated intent to install solar on all homes in the development.

Based on 2016 participation, there is opportunity to engage affordable housing developers to encourage additional participation in NSHP. Based on reported costs in approved payment claims, the average cost per watt for affordable housing systems was more than 20 percent higher than for systems serving market-rate subdivisions. As the NSHP incentive covers, on average, a greater share of the total reported cost, participation in NSHP continues to mitigate costs to install.

Over the course of the NSHP program, projects have been funded in 51 out of California's 58 counties. These 7 underrepresented counties have limited or no opportunity for NSHP funding as they are not located within an eligible IOU territory or have a low volume of new residential construction. Therefore, NSHP has reached essentially all counties that meet program eligibility. Based on the median income of zip codes where NSHP projects are installed, the program has served a wide range of household incomes. Of the 85 MW of capacity installed through the end of 2016, 10 MW belonged to affordable housing projects, corresponding to $26 million out of the total $160 million of paid incentives. Considering installed, reserved, or under review capacity, the program has achieved 68 percent of the overall 360 MW target, with 32 percent remaining to be installed.

At the end of 2016, Energy Commission staff was finalizing an updated version of the *NSHP Guidebook* to streamline program processes for both market-rate and affordable housing projects. The *NSHP Guidebook, Tenth Edition* was adopted as part of the Energy Commission's March 8, 2017 Business Meeting. More information will be made available in program reporting addressing 2017 activities.

According to the Construction Industry Research Board (CIRB), housing production reached a high of over 100,000 total housing units permitted during 2016. As building activity increases, it is reasonable to expect program participation to increase. This appears to have been reflected in the higher numbers of reservation applications

submitted to the Energy Commission during 2016 and this trend is anticipated to continue in 2017.