



# New Solar Homes Partnership (NSHP)

## **Welcome to the NSHP Staff Workshop Renewable Energy Division**

California Energy Commission  
Arthur Rosenfeld Hearing Room  
July 8, 2016



## NSHP Program Goals

- Sustainable solar homes market; builder commitment to install solar energy systems
- High-performing solar systems on highly efficient residential construction
- Achieve 360 megawatts of installed solar electric capacity in California
- Solar on 50%+ of new homes
- Self-sufficient solar industry



Photo Courtesy of Sherrill Neidich



# NSHP Eligibility Requirements



- New Residential Construction
- Electric Customer of PG&E, SCE, SDG&E, or BVES
- PV systems must be 1 kW AC or larger
- 10 - year warranty
- PV systems and energy efficiency measures are third-party verified



# NSHP Timeline – Guidebook Update

Tentative Events	
Guidebook Draft	Mid August 2016
Draft Guidebook Workshop	Late August 2016
Guidebook Adoption	October Business Meeting 2016



## CPUC decision

- November 13, 2015, the Energy Commission requested funds from the CPUC
- At its June 9, 2016 Board Meeting, the CPUC voted and approved Decision 16-06-006, authorizing funding of \$111.78 million.
- New administrative and oversight requirements
- The California Energy Commission shall notice a workshop to discuss various topics



## Purpose of NSHP Workshop

- The CPUC decision directed the California Energy Commission to notice a public workshop to:
  - 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
  - Discuss a possible plan for Measurement and Evaluation metrics for the NSHP program, with at minimum, impact evaluation and cost effectiveness studies



## Workshop Agenda

9:00am	Welcome and Housekeeping
9:15am	Panel 1: Incentives & Costs
10:45am	Morning Break
11:00am	Panel 2: Principal-Agent Barrier
12:00pm	Lunch
1:00pm	Panel 3: Affordable Housing
2:15pm	Afternoon Break
2:30pm	Panel 4: M&E, Outreach
3:30pm	Adjourn



# Panel 1: Incentive Levels and Program Costs

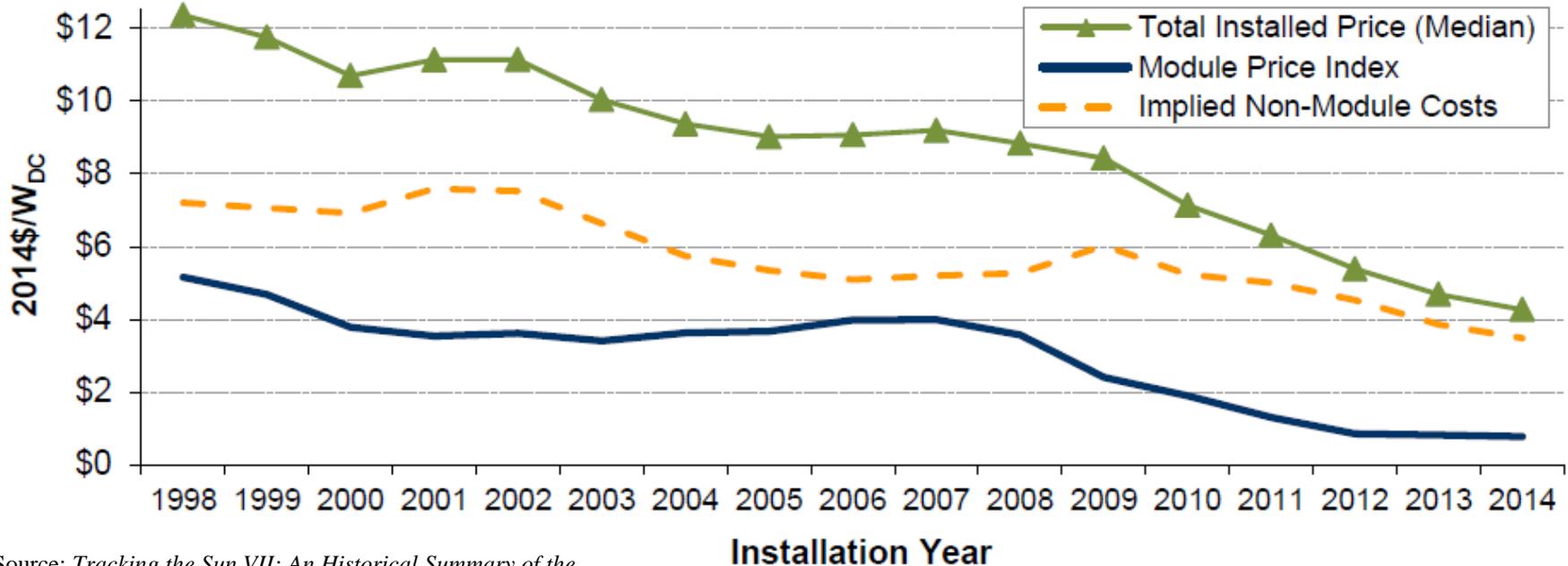
New Solar Homes Partnership  
Renewable Energy Division

Joseph Omoletski



# Cost Stats/Trends

- System costs have fallen dramatically over the life of the program (over 50%)
- Higher occurrence of premium/BIPV modules in new residential solar (almost 90% vs 40% retrofit): higher cost



Source: *Tracking the Sun VII: An Historical Summary of the Installed Price of Photovoltaics in the United States from 1998-2013*



## Program Costs

- NSHP-specific third-party verifications
  - Solar: \$100-\$200 per site
  - Energy Efficiency (Tier I/II only): \$200-\$300
- Tier I/II energy consultant work
- Stakeholder administration costs



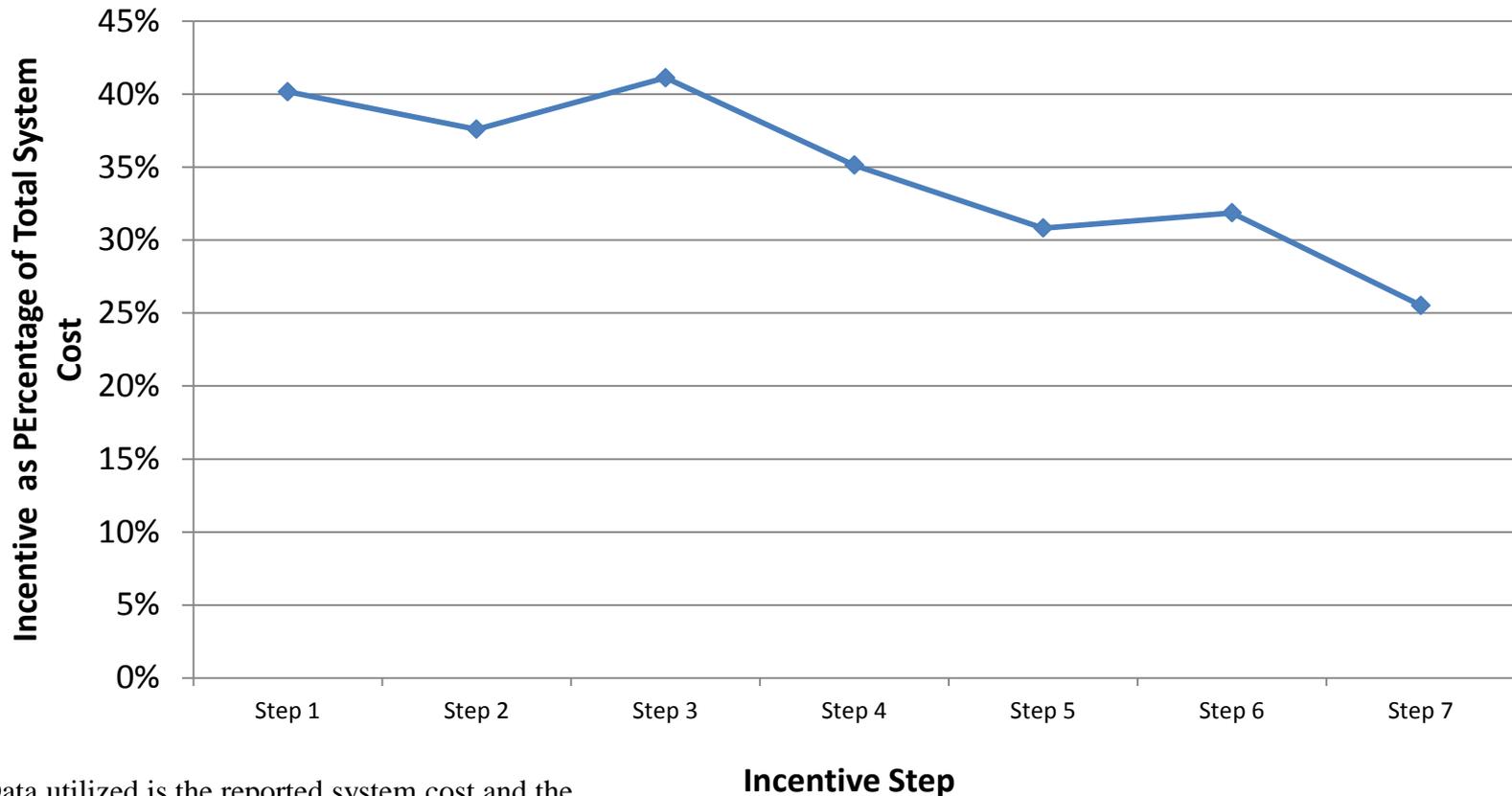
# Current Incentive Structure

Code-Compliant Incentive	Tier I Incentive	Tier II Incentive	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	60
\$0.35	\$0.50	\$1.00	65
\$0.25	\$0.35	\$0.75	72



# Incentive as Percentage of System Cost

As the incentive level has dropped, the incentive has made up a smaller portion of the overall system cost for homes in developments



\*Data utilized is the reported system cost and the calculated system size (CEC-AC) from NSHP participants



## Panelists

- Jacob Atalla, KB Homes (teleconference)
- Matt Brost, SunPower
- Noelle Lloyd, SolarCity
- Helena Oh, Public Utilities Commission's Office of Ratepayer Advocates (ORA)
- Robert Raymer, California Building Industry Association (CBIA)
- Sarah Truitt, National Renewable Energy Laboratory (NREL) (teleconference)
- **Moderator:** Joseph Omoletski, CEC



## Questions

1. What are the challenges or obstacles builders must consider when deciding to install solar in new developments? How do these challenges differ for small, midsize, and large builders?
2. What are the current trends for PV hardware and “soft” costs?
3. What are the specific costs associated with NSHP participation for program applicants? How can these costs be mitigated? How does the energy efficiency of the home(s) affect these costs (Code-Compliant vs Tier I/II)?



## Questions

4. Based on the current NSHP incentive structure, will future program participation be cost-effective for builders?
5. To what extent is NSHP currently enabling builders to make solar a standard feature? Will builders incorporate solar as a standard feature for developments without incentive support, and if not, what new program elements could be designed to promote this market transformation?
6. What changes to the program incentive structure should be considered (if any) to stimulate the new home solar market while maximizing ratepayer value? Should the incentive structure take into account the rise in mandatory solar?



# Panel 2: Principal-Agent Barrier

New Solar Homes Partnership  
Renewable Energy Division

Kevin Wong



## Overview

- What is the principal-agent barrier?
  - Conflicting goals between two parties
    - Principal = Homebuyer
      - Principal's goal: to maximize energy cost savings
    - Agent = Homebuilder
      - Agent's goal: to reduce capital costs and maximize profits, also have home appeal to wider audience.
  - Information asymmetry
    - Homebuyer knows more about their household's energy consumption patterns than the homebuilder
    - Homebuilder knows more about the energy features than the homebuyer



## Consequence

- Potential market failure results in overall less investment in energy efficiency and solar PV
  - Homebuyers are unsure if energy investment decisions are made in their best interest. They may not have resources to compare energy savings.
  - Homebuilders may underinvest/overinvest in energy features compared to consumer desires.



Photo courtesy of Sherrill Neidich



## Panelists

- Jacob Atalla, KB Homes (teleconference)
- Matt Brost, SunPower
- Warren Leon, Clean Energy States Alliance (CESA) (teleconference)
- Robert Raymer, CBIA
- Sarah Truitt, NREL (teleconference)
- **Moderator:** James Friedrich, CEC



## Questions

1. What challenges do developers face in marketing and selling new solar homes?
2. What information could developers use to help persuade new home buyers to pay a premium for solar homes? Would it be helpful to have a CPUC or CEC-approved source for estimates of average expected bill savings and/or payback periods?
3. In addition to monetary incentives, are there other tools that can be employed to motivate builders to install solar in new developments?



# Panel 3: Affordable Housing

New Solar Homes Partnership  
Renewable Energy Division

Katharine Larson



## Motivation

- Remove barriers to solar adoption for low-income communities
- Consistent with priorities of the state



**NSHP Affordable Housing Townhomes**  
Photo courtesy of Habitat for Humanity, East Bay



## NSHP Affordable Housing (AH)



**Mutual Housing at Spring Lake in Woodland, CA**  
Photo courtesy of Brett Arriaga

- Higher per-watt incentives for qualifying residential units
- Longer reservation periods (residential units and common areas)



## Eligibility Requirements

- Regulatory Agreement
  - Income-restricted occupancy of at least 20% of units for at least 10 years
  - Entered with housing agency, housing authority, redevelopment agency, or city/county
- Qualifying residential units receive higher incentive rate
  - Units subject to agreement's income controls
  - Based on PV system owner tax status
- Common areas must be for primary use of residents of eligible units



## Eligibility Requirements

- Current effort to simplify participation requirements for affordable housing projects
- Future considerations include:
  - Burdensome documentation for system owner and necessity of tax-exempt status
  - Appropriate incentives for common area projects
  - Permit deadlines
- Discussed in next guidebook revision



## NSHP Program Statistics

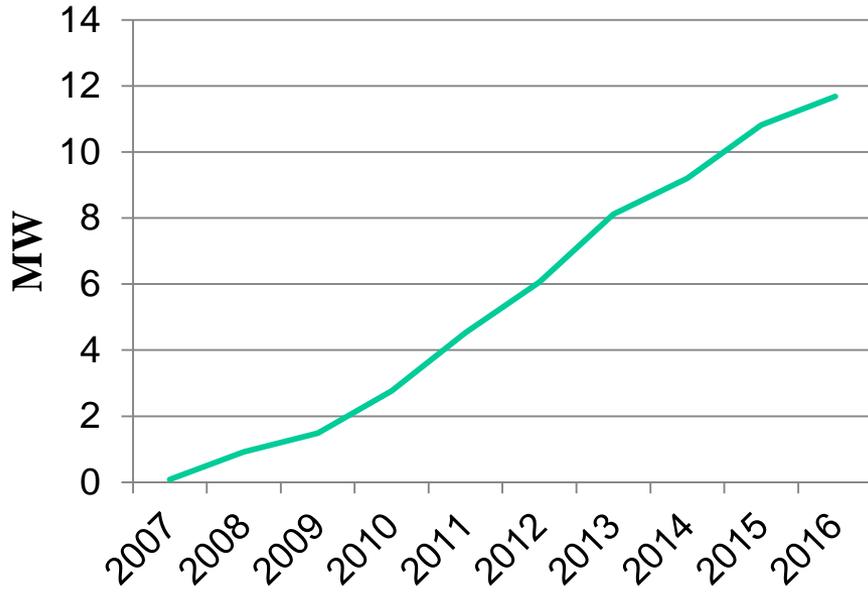
Since the beginning of the program:

- **7.13 MW** installed in affordable housing projects (~11% of program activity)
- Installed systems have received **\$20.5 million** in incentives (~15% of program activity)
- AH capacity target based on current incentive structure: **35.2 MW** (~10% of program target)

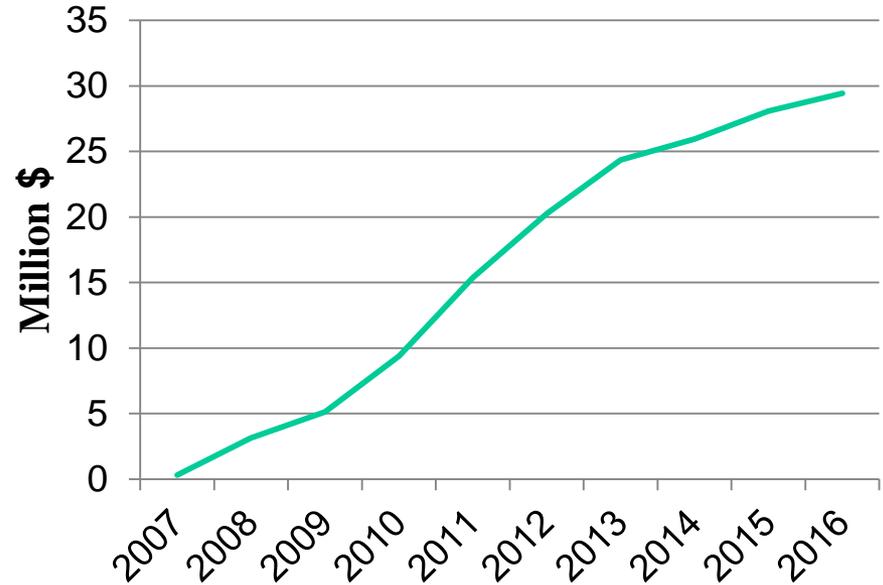


# Reserved AH Projects

### Cumulative Capacity Reserved

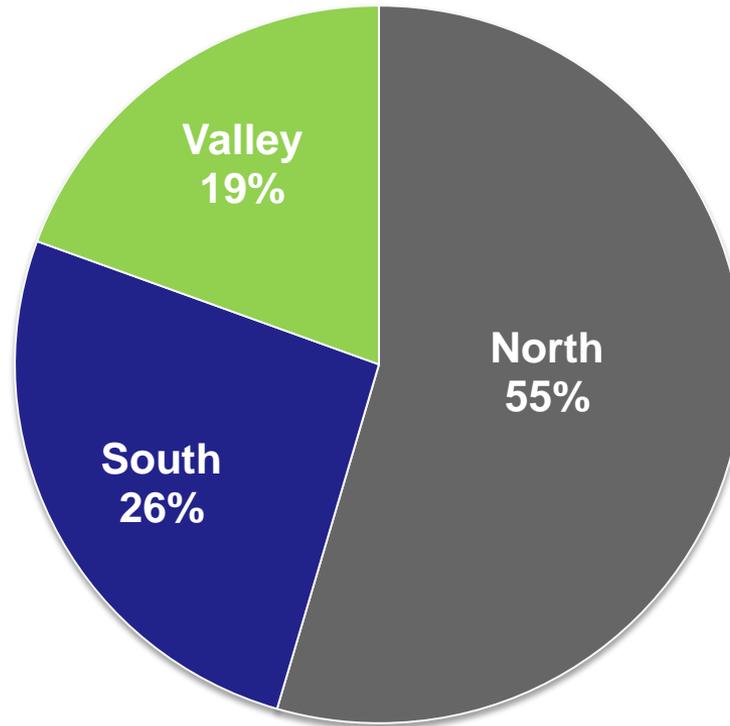


### Cumulative Funding Reserved





# NSHP AH Capacity Installed by Region





## Panelists

- Sean Armstrong, Redwood Energy
- Mary Jane Jagodzinski, Community HousingWorks (teleconference)
- Charles Mason, Ubuntu Green
- Seth Mullendore, Clean Energy Group (teleconference)
- Jon Peterson, Habitat for Humanity of Southern Santa Barbara County (teleconference)
- Wayne Waite, California Housing Partnership Corporation
- **Moderator:** Katharine Larson, CEC



## Questions

1. What are the main barriers preventing new affordable housing from installing solar systems?
2. What are the specific challenges of NSHP program participation for affordable housing applicants? How can the NSHP program encourage and increase participation for current affordable housing residential unit projects?



## Questions

3. Does the current affordable housing element of NSHP adequately reach disadvantaged communities?
4. What lessons can be learned from other state energy programs targeting low-income, disadvantaged populations?



# Panel 4: Measurement & Evaluation

New Solar Homes Partnership  
Renewable Energy Division

Connor Smith



## Introduction

- Public Workshop: **Impact Evaluation & Cost Effectiveness Studies**
- The M&E Plan should include: Analysis of NSHP customers' **geographic & income** distribution
- The CEC shall periodically re-assess incentive levels to ensure maximizing ratepayer value



# Measurement & Evaluation

Goals to consider:

- Avoids redundant information
- Analyzes the Program's performance
- Implementable by CEC staff
- Stays within a limited budget



# Data currently posted on the GoSolarCalifornia website

## NSHP Program Totals

	# of Applications	# of Systems	\$ (Millions)	MW (AC)
<b>Under Review</b>	185	4,893		
<b>Reserved</b>	964*	30,259	96.9	104.2
<b>Installed</b>	2,591*	23,876	149.9	74.7
<b>Total</b>	3,740	59,028	246.8	178.9
<b>Funding</b>				
<b>Available Funding</b>			40.1**	
<b>Under Review</b>			11.7	18.5
<b>Remaining Funding</b>	***		28.4	

### Installed Total Capacity

**No. Calif.:**  
 9,620 systems  
 36.2 MW AC  
 \$76.1 million

**So. Calif.:**  
 14,258 systems  
 38.5 MW AC  
 \$73.8 million



# NSHP Web Tool Application

<b>Data Fields</b>	
• <b>City</b>	• <b>Zip Code</b>
• <b>System Cost</b>	• <b>Site Capacity</b>
• <b>Site/Project Status</b>	• <b>Incentive Amount</b>
• <b>Incentive Payment Date</b>	• <b>Reservation Submittal Date</b>
• <b>Reservation Approval Date</b>	• <b>Utility</b>
• <b>Project Type</b>	• <b>Reservation Type</b>
• <b>Project Expiration Date</b>	• <b>Incentive Level</b>
• <b>Sales Type</b>	• <b>Quantity of Equipment</b>
• <b>Installer &amp; Retailer</b>	• <b>Model of Equipment</b>



# Reporting Data Required Quarterly/Annually

Progress toward meeting  
Program **MW goal**

## **Reservations:**

- Funds encumbered
- Total installed capacity
- # of installed systems

Program activity for  
**affordable housing** projects

## Program activity by **project type** (e.g.):

- Large developments
- Custom homes
- Multifamily

**Applications submitted and reviewed** (reserving funds and payment claims)

## **Payment Claims:**

- Amount of funds paid
- Total installed capacity
- # of installed systems



## Panelists

- Warren Leon, CESA (teleconference)
- Helena Oh, ORA
- Robert Raymer, CBIA
- Sarah Truitt, NREL (teleconference)
  
- **Moderator:** Sherrill Neidich



## Questions

1. What metrics should be collected and analyzed to assess program success?
2. Given the NSHP program's limited budget for M&E activities, which variables can be reported on by CEC staff? Are CEC resources sufficient for evaluation, or should the CEC pursue statutory authority to spend funds on a consultant?
3. Is there any other NSHP program data that would be beneficial to report on a monthly/quarterly/annual basis?
4. Do customers understand the value of solar systems to them? What, if any, concerns did customers have about buying a home with solar? What information was most useful to them to allay those concerns?
5. How should CEC staff direct outreach and education efforts in order to improve NSHP program participation?



## Next Steps

- Please submit comments to the Energy Commission's E-commenting online system by 5:00 pm on July 22, 2016
  - **Visit** <http://www.energy.ca.gov/e-filing/>
- OR**
- **Mail** to: California Energy Commission  
Dockets Office, MS-4  
Re: Docket No. 16-NSHP-01  
1516 Ninth Street  
Sacramento, CA 95814-5512



Thank you for participating!

Today's agenda and PowerPoint presentation will  
be available online at:

<http://www.gosolarcalifornia.ca.gov/nshp/training/>