



New Solar Homes Partnership and Senate Bill 1

**California PV Utility (CPVU) Manager Meeting
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New Solar Homes Partnership

- High Performance Solar Homes
 - High Levels of Energy Efficiency
 - High Performance PV Systems
- Expected Performance Based Incentives
- Extend Building Standards Methods
 - PV Calculator
 - Certification of Modules/Inverters
 - Third-Party Field Verification



CEC PV Calculator

- Based on "Five Parameter Model"
 - Algorithms developed by Dr. William Beckman, University of Wisconsin-Madison Solar Energy Lab (originator of F-Chart)
 - Public Domain Model Published in *Solar Energy*, 80 (2006) 78-88 - www.sciencedirect.com
 - Uses data from performance tests as inputs
 - Hourly performance calculation that enables TDV
 - Uses Commission weather data and climate zones
 - Uses Certified Module and Inverter data from CEC database
- Dr. Beckman implemented algorithms for CEC PV
- Commission would approve other software tools that properly implement the model and datasets



Module Certification

Appendix 3

- Manufacturer Certification of Module Test Data
 - IEC Standard 61215 – Crystalline Silicon Modules
 - IEC Standard 61646 – Thin-Film Modules
 - Use Laboratories Accredited by the International Laboratory Accreditation Cooperation for Testing
 - Specify Test Configuration for Cell Temperature Testing for BIPV
 - Certification Mandatory Starting January 1, 2008
- Manufacturer Certification of Inverters
 - Use Full Data Certified to the Commission



Field Verification

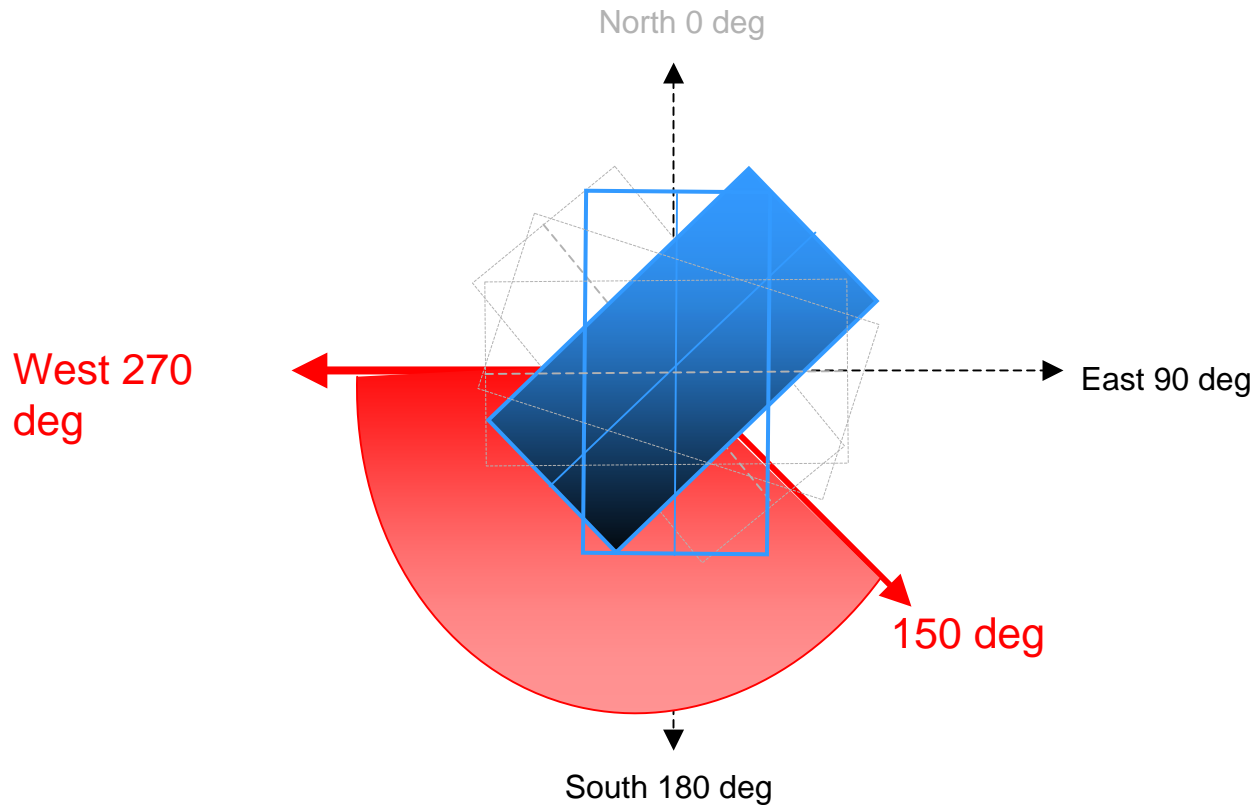
- Visual Inspection
 - Verify that installed equipment (modules and inverter) are the same as specified
 - Verify that the system meets the California Flexible Installation Criteria OR
 - Verify that site-specific installation details are the same as specified in the calculations
- Shading Evaluation
 - Check for "minimal shading" criterion
 - Check for shading obstructions specified in the calculations
 - Check for trees that will shade modules at maturity
- Performance Verification
 - Measure solar irradiation and ambient temperature
 - Look up the expected output for the measured conditions on the table generated by the CEC PV software
 - Verify AC output displayed on the inverter is as expected
- Installer Checks 100%; HERS Rater Uses Sampling

Appendix 4



California Flexible Installation Criteria

- *Azimuth*
- *Roof Pitch (4:12 - 7:12)*
- *Minimal Shading*





Energy Efficiency

- Tier I – Minimum Condition of Participation
 - 15% Savings Beyond T-24 Total Energy Budget
 - Current Utility New Construction Programs
- Tier II – Immediate Positive Cash Flow
 - 35% Savings Beyond T-24 Total Energy Budget
 - 40% Savings Beyond T-24 Space Cooling Budget
 - Commission Preferred Level
 - Moves Towards Zero Energy New Homes
 - Achieved by Current Building America Homes in California
 - Commission Seeks CPUC/Utility Support for New Construction Program Incentives for Tier II
- Both Tiers: Energy Star Appliances



Senate Bill 1 Eligibility Criteria Duties

- Energy Commission Must Develop by 1/1/2008
- In Consultation with CPUC and Munis
- Eligibility Criteria and Conditions for Incentives
- Adopt Guidelines Through Public Proceeding
- CPUC and Municipal Utilities Solar Programs Must Be Consistent with Eligibility Criteria



Eligibility Criteria Must Address

- Design, Installation and Electrical Output
- Installation Guidelines -- Proper Siting & High Quality Installation to Maximize Performance
- Optimal Performance During Peak Periods
- Energy Efficiency Measures for New or Existing Home or Commercial Building
- Rating Standards for Equipment, Components and Systems



Energy Commission's SB 1 Plans

- Use New Solar Homes Methods and Tools as a Starting Point – Extend and Improve
- Draw on In-House Expertise For Energy Efficiency for New and Existing Buildings
- Coordinate with and Seek Input from CPUC and Municipal Utilities
- Develop Draft Guidelines
- Hold Public Workshops to Vet Draft Guidelines