

# High Penetration Solar Forum

March 2011



U.S. DEPARTMENT OF  
**ENERGY**

Energy Efficiency &  
Renewable Energy

## High Penetration Solar Portal Project

Kristen Nicole, SRA

U.S. Department of Energy

National Renewable Energy Laboratory

# Background



Energy Efficiency &  
Renewable Energy



- Established Need
  - May 2010 U.S. Department of Energy Program Review established a need for better communication
  - Nov 2010 Tempe, AZ DOE/NREL/SEPA Workshop again emphasized this need
- **Education** High Pen scenarios will not occur simultaneously across the country
- **Commonalities** All feeders were not created equal
- **Organization** Aggregate vs create
- **Coordination** Demonstration and funding showcase
- **Efficiency** Too many meetings/workshops

# Web Development

- NREL was tasked with web development
  - Operating within EERE web guidelines
- EERE Pilot of dynamic web functions
- CMS – Content Management Systems
  - Information architecture to scope complexity of problems of high pen solar



# Web Structure

## Contextual Challenges & Topics

- Technological Components
- Modeling & Simulation
- Solar Resource
- Transmission Planning & Operations
- Distribution Planning & Operations
- Codes & Standards

## Demonstration Projects (PM & Technical Specs)

- DOE Solar High Pen
  - NREL , UCSD, VT, APS, SMUD, FSU
- CPUC RD&D
  - CPR, SunPower, UCSD, SMUD, NREL
- Other (DOE, Int'l, etc.)

## Web Functions & CM

- Publications
- Project deliverables & characterization
- Workshop presentations
- News & Events
- Discussion Board

# Demonstration Elements

## **PROJECT NAME**

- Awardee
- Project Partners
- Location (city, state)
- Grant Number
- Award Date
- Funding
- Match Funding
- Major Milestones
- Start Date
- End Date
- Project Manager
- Grant Manager
- Summary
- Expected Impacts
- Deliverables
- Time Period Activity
- Project in the News
- Project Documents
- FOA
- Program Review Presentation
- Downloadable Fact Sheet (PDF)
- External Web Links related to the Project

# Demonstration Elements

## Technical Information

### PV Characteristics:

- # of residential units
- Capacity range of residential units
- Aggregate capacity of residential units
- # of utility scale units
- Capacity range of utility scale units
- Aggregate capacity of utility scale units
- Largest single unit capacity

### Installed storage:

- Project has storage (Y/N)?
- # of storage devices
- Aggregate storage capacity
- Range of storage capacity
- Role of storage (single home, community storage, etc.)

# Demonstration Elements

## **Demonstration Circuit(s) Characteristics:**

- Peak load
- Minimum load
- Feeder length
- Circuit type (urban, suburban, rural, etc.)
- Major loads
- Approximate geographical footprint
- Customer make up (% Residential, % Commercial, % Industrial, etc.)

## **Modeling and Simulation:**

- Types of simulations (steady-state, dynamic, transient, etc.)
- Phenomenon investigated (voltage regulation, harmonics, short circuit, etc.)
- Modeling package(s) used
- Simulation time resolution
- Load modeling
- Time resolution
- Values (kw-hr, kw, kVAr, kVA, etc.)

# Demonstration Elements

- Weather resources
  - Time resolution
  - Spatial resolution (point, 10x10km etc.)
- Data Acquisition:
  - AMI (Y/N)?
    - Percentage AMI
    - AMI characteristics
  - Electrical Data
    - Sample rate
    - Monitored quantities (voltage, frequency, etc.)
    - Number of systems
- Weather Data
  - Sample rate
  - Monitored quantities
  - Number of system
- Communication:
  - Technologies
  - Capabilities
- Technical papers that have come out of this project

<https://solarhighpen.energy.gov>

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

EERE Home | Programs & Offices | Consumer Information

Welcome, Guest! | Login | Register

## High Penetration Solar Portal

High Penetration Solar Portal

Search Help >

Printable Version SHRE

EERE » Solar Energy Technologies Program » High Penetration Solar Portal

**About**

**Topics**

- Solar System Technologies
- Solar System Modeling and Simulation
- Transmission Planning and Operations
- Distribution Planning and Operations
- Standards and Codes
- International Efforts

**Working Groups**

**Demonstration Projects**

**Resources**

**Discussion Board**

**Past Events/Workshops**



Integrating high penetrations of solar into the existing electric grid is a complex issue with many challenges. Through the High Penetration Solar Portal, the utility community, high penetration project teams, national laboratories, and other stakeholders, will share results, information, and expertise. The site will inform participants on the impact of high penetrations of solar on distribution and transmission systems and help expand the utility solar market.

### FEATURE ARTICLE

**WELCOME FROM DOE AND CPUC**

December 16, 2010

Nullam sodales, turpis eu vulputate congue, neque lectus placerat nisi, at

### NEWS

**Energy Department to Invest up to \$7 million to Support Early-Stage Solar Technologies**  
February 4, 2011 | NREL News

**UPDATE 1-Siemens to use Suntech panels in solar projects**  
January 27, 2011 | Reuters: Energy

**UPDATE 1-LDK Solar says ADS offering priced at 5 pct discount**  
January 27, 2011 | Reuters: Energy

[More News >](#)

### EVENTS

There are no upcoming events.

February						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

Please feel free to contact us for any details or clarification related to presentations

Kristen Nicole : kristen.nicole@ee.doe.gov 202-287-1781

Adrienne Powell: adrienne.powell@nrel.gov 303-275-3683

Tina Eichner: tina.eichner@nrel.gov 303-275-3685

# THANK YOU