

# NREL's PV Tools on the Web: The OpenPV Project



**NREL TAP Webinar**

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# Overview

A rectangular panel with a grid of solar cells, featuring a dark blue central area with the word "Background" in white text.

Background

A rectangular panel with a grid of solar cells, featuring a dark blue central area with the word "Structure" in white text.

Structure

A rectangular panel with a grid of solar cells, featuring a dark blue central area with the word "Status" in white text.

Status

A rectangular panel with a grid of solar cells, featuring a dark blue central area with the word "Future" in white text.

Future

A rectangular panel with a grid of solar cells, featuring a dark blue central area with the word "Demo" in white text.

Demo



# Background

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## Original Concept:

- Collect Data about PV installations in the United States
  - Size
  - Date
  - Cost
  - Location
- Provide public access to PV installation data

## Limitations:

- Spreadsheet data storage
- Yearly data updates
- Visualization an afterthought



# Background

## Revised Concept:

- Develop living, breathing database
  - Leverage user contributions
- Cutting edge data delivery
  - Interactive map-based visualization

## New Goal:

- Collaborative effort between government, industry, and the public to build a dynamic, interactive, and comprehensive database of PV installations in the US
  - To build a community

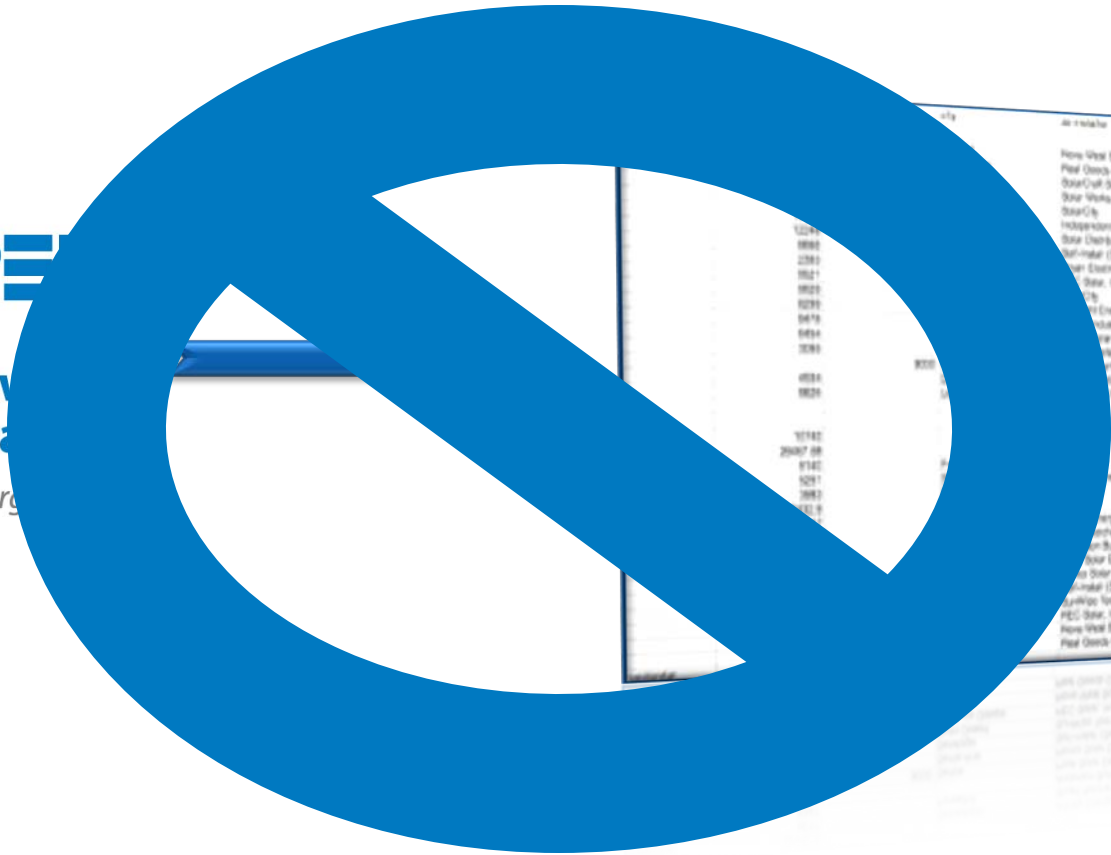
# Background



**NREL**

**National Renewable  
Energy Laboratory**

*Innovation for Our Energy Future*

A background image of a document containing a table with multiple columns and rows of text, likely a list of names and addresses. The text is mostly illegible due to the large blue prohibition sign overlaid on it.

# Background

## Utilities



A screenshot of a data table with multiple columns and rows, likely representing utility company information.



## Public Users



A screenshot of a data table with multiple columns and rows, likely representing public user information.



## PV Installers



A screenshot of a data table with multiple columns and rows, likely representing PV installer information.



## Gov't Agencies



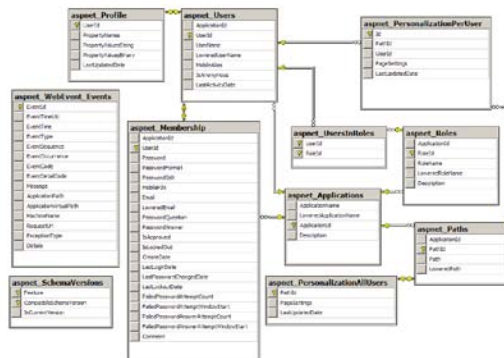
A screenshot of a data table with multiple columns and rows, likely representing government agency information.



# Structure

## Data

- A “schema-less” Database
  - 4 required fields:
    - Size, Cost, Date, Location
  - Anything else goes:
    - Incentives, Inverters, Installer, Etc...



# Structure

## Data

- Data Quality
  - Hierarchical scoring
    - Climbing the “scoring ladder”
  - User feedback
- Data Validation
  - Basic data validation on entry
  - Scheduled data validation routine
- Data Duplication
  - Scheduled data de-duplication routine





# Structure

## Website

- Info about the project
  - About
  - News
  - FAQ
- Account registration / login
- Data upload
  - Upload one or many records
- Data download
- Data exploration
  - Time mapper
  - Market mapper
  - Search capability

The screenshot shows the NREL Open PV Project website. At the top, the NREL logo and tagline "National Renewable Energy Laboratory Innovation for Our Energy Future" are visible. The page has a navigation menu with links for Home, About, Explore, Search, Share Data, Contributors, News, Contact, and FAQ. The main content area is divided into several sections:

- Welcome:** A section with a sun icon and text explaining the project's goal: "The Open PV Project is a community driven database of Photovoltaic (PV) installations. The goal of this project is to collect, organize and distribute knowledge of the location, size, cost and date of every PV installation in United States." It also includes a call to action: "We are actively seeking contributions to project, so please sign up to become an Open PV Project member and start contributing your data!"
- Login:** A section with a login form containing fields for Username and Password, a Submit button, and links for "Forgot your password?" and "Create a new account".
- Explore the Open PV Project:** A section with a "Visualize Open PV with the Market Mappers" button and a "Detailed search of database:" form with a search box and a "Search" button. Below this is a "Click image to view U.S. solar photovoltaic installations through time" link and a map showing PV installations in the U.S. with a legend for "PV Installation Concentration".
- National Statistics:** A section with a "Data Disclaimer" and a table of statistics. The disclaimer states: "The statistics, rankings, and other estimates presented by the Open PV Project are only estimates and do not represent the actual current market status. All values presented on this website will change as more data are added to the Open PV database. For estimates on the current state of the US PV market see: <http://www.irecusa.org/> and <http://eetd.lbl.gov/>."

Summary	Installs (#)	Capacity (MW)	Cost (\$)
Total number of PV installations:	67392		
Installed Capacity (MW):		785.965	
Average cost per watt (2009):			\$ 8.01

# Status

## Project Totals (as of 3/23/10)

Number of installs:	69,869
Total capacity (MW):	784.74
Average cost/watt (2009):	\$8.01
Registered users:	720
Data contributors:	81

Contributor	# of Installs	Capacity (MW)
NREL	515	75.7
Gov't agencies	62,619	599.4
Utility, installer, public	6,735	109.64

# Status

## Top 5 States – Number of Installations (as of 3/23/10)

State	# of Installs
California	53,726
New Jersey	5,271
Massachusetts	1,919
New York	1,664
Arizona	1,470

# Status

## Top 5 States – Capacity (as of 3/23/10)

State	Capacity (MW)
California	489.661
New Jersey	123.938
Florida	29.924
Nevada	28.717
Colorado	28.453



# Status

## OpenPV vs. other data collection efforts

- IREC Report (through 2008)

- Grid-tied installations: 69,000
- Top 10 states capacity: 792 MW

- Tracking the Sun II (through 2008)

- Installations: 52,356
- Capacity: 566 MW

- OpenPV (through 2008)

- Installations: 53,686
- Capacity: 587 MW



# Future

## Continue data collection

- Become trusted and authoritative data repository

## Enhancements to foster user contributions

- Exposure for top contributors
- Unique contributor specific views of data
- Allow photo uploads and user comments

## Advanced tools

- Breakeven scenarios
- Web services (open access to data)

## International? Other technologies?



# Demo

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Current Release - <http://openpv.nrel.gov>