

Solar Energy Research

Research Breakthroughs: What's Needed to Accelerate Path to Market and Achieve California's 2020 Renewable Energy Goals?

Hearing Room A

2/29/2012

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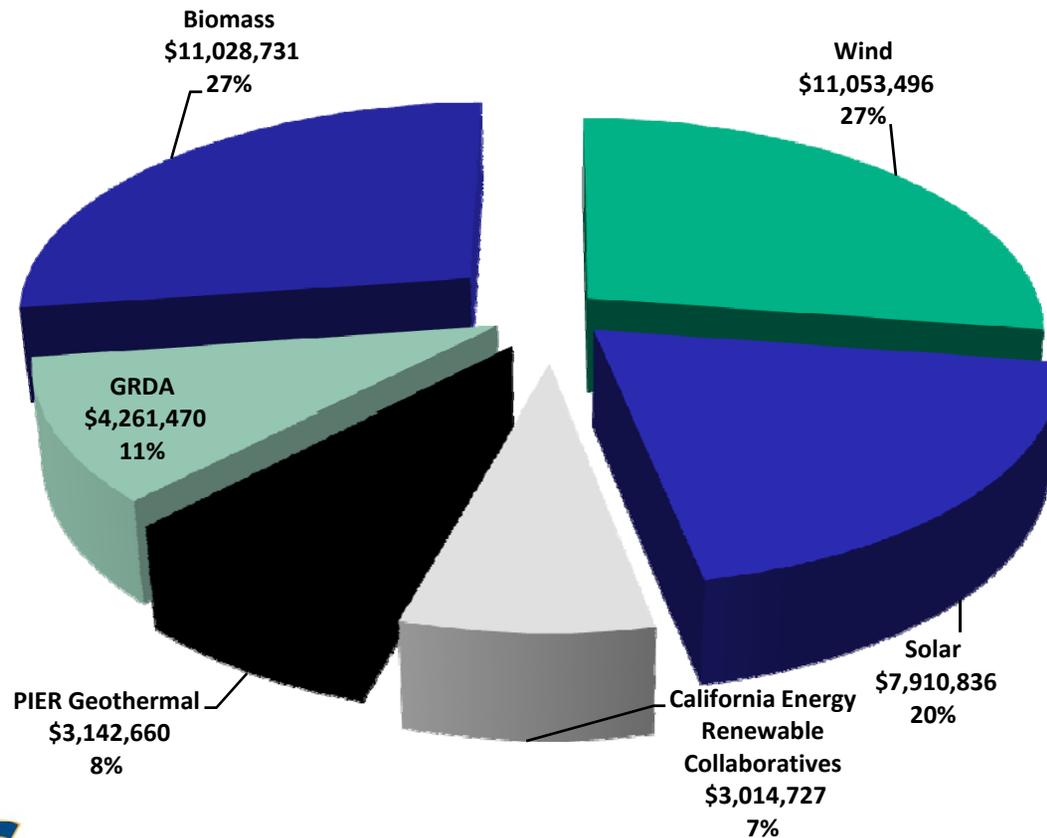
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Renewable Energy RD&D

Renewable Energy RD&D & GRDA Active Projects - \$40,411,920



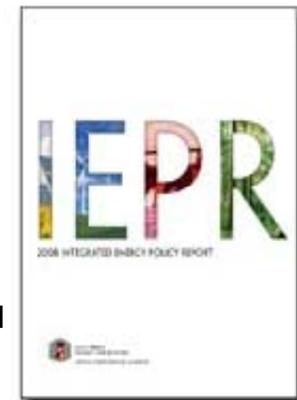
2009/2010 FY PIER Electricity Budget



2008 IEPR Recommendations

2008 IEPR

- Increase capability of forecasting tools; better wind and solar forecasting capability and better communication between forecasters and the CA ISO floor operators
- Focus on identifying energy storage technologies and accelerating their commercialization
- Expand efforts to include renewable generation at the distribution level, such as community scale PV or small wind
- Increase use of renewable technologies for heating and cooling (e.g. solar thermal water heating, geothermal ground-source heat pumps)
- Better link between renewables and demand side and thermal storage strategies

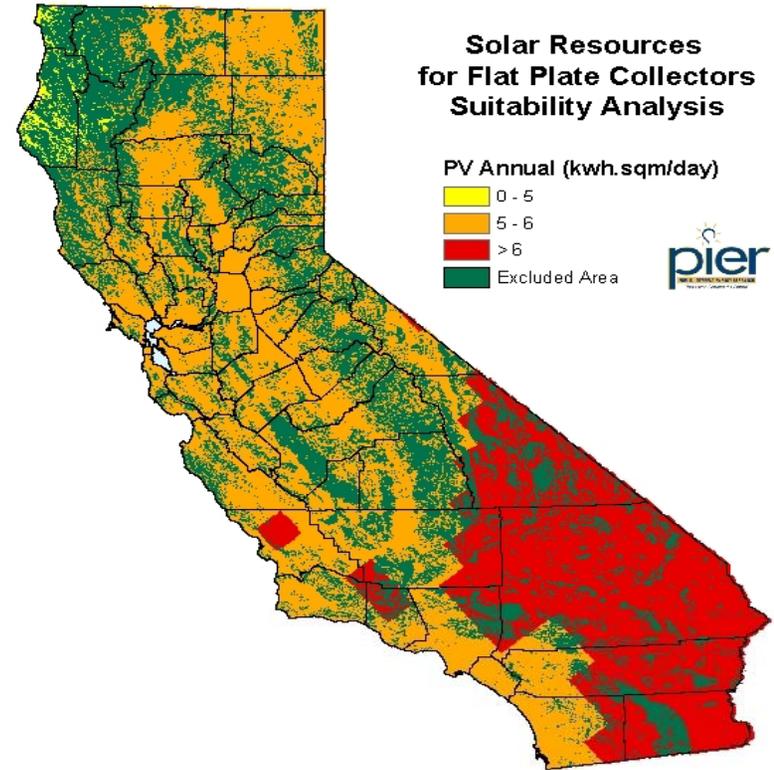
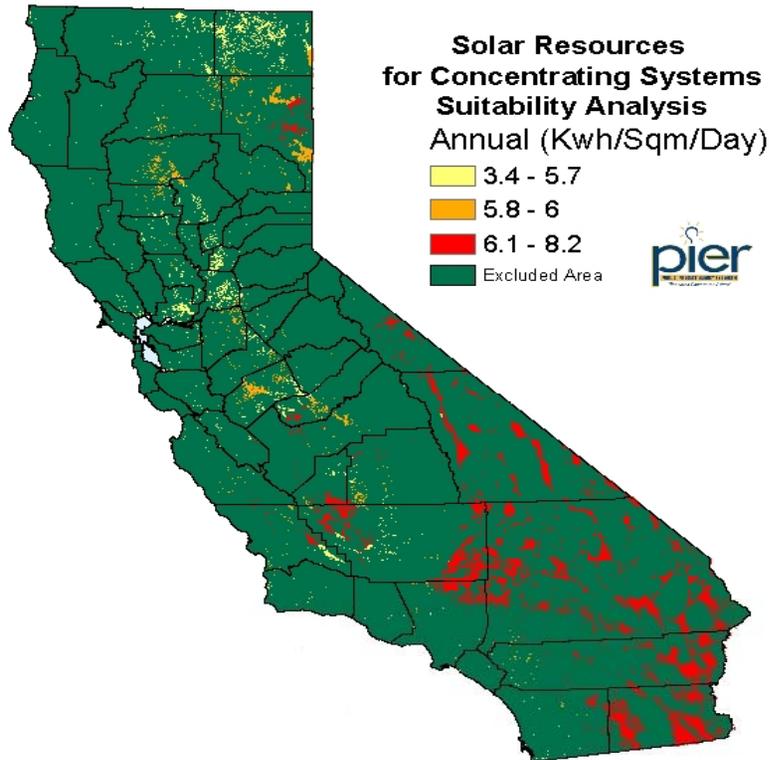


PIER Solar Research

- **Resource Assessment**
- **Technology Development & Demonstration**
- **Cost Reduction & Efficiency Improvement**
- **Solar Forecasting**
- **Solar Energy Storage**



Resource Assessments



CSP, greater than 6 kWh / day annual average, less than 1% slope, no forest / water / roads or building lands.

Flat Plate Solar, exclude north sloping greater than 5%, exclude roads, forest areas, bodies of water and airports.

PowerLight Tracker

Improved Tracker for solar PV Systems

Results Accomplished:

- Tracker life cycle cost reduced by 29%
- Design to installation time reduced by 58 %
- Material waste stream reduced by 20%
- Reliability: no problems reported



PowerLight Homes & SunTile™

RESIDENTIAL - SLOPED



SunTile™ Roof Integrated Solar

- Attractive design
- Maximum efficiency cells
- Roof Neutral
- Class A fire rating
- UL Listed



California Energy Commission - Public Interest Energy Research Program

California Energy Commission, 2011. **2011 Integrated Energy Policy Report. Publication**
Number: CEC-100-2011-001-CMF.

“PIER Program participant GreenVolts, Inc., developed a new concentrating photovoltaic (CPV) system with low-cost installation, low-cost manufacturability, technical performance improvements, minimal ground footprint, and comprehensive “system” delivery. This new CPV system will speed the deployment and adoption of CPV technology in various applications. Originally funded by the PIER Program, Green Volts received \$40 million in venture capital funds to demonstrate and commercialize the product. The technology is now in full production, with six installations in California and Arizona (totaling 400 kilowatts) and several sites in development ranging in size from 200 kilowatts to 1 megawatt. A 2.5-megawatt operation is under construction in Byron, California. The development of these projects resulted in 100 jobs at Green Volts, 20 manufacturing jobs, and more than 30 jobs for various installation contracts. Figure 18 shows one of GreenVolt’s CPV installations.”



*GreenVolt’s concentrating photovoltaic system installed in Fremont, California.
Photo credit: GreenVolts, Inc.*

Discussion Questions

- What further R&D work is needed to help make solar more cost effective and self-sufficient?
- What R&D efforts are needed to help reduce water use and land footprint of utility scale solar installations or shift development to previously disturbed lands?
- Is there any critical R&D work still needed to accelerate deployment for solar thermal technologies ?

PIER Solar R&D Publications

- **Solar PV:**

<http://www.energy.ca.gov/publications/searchReports.php>

- **Solar Thermal:**

<http://www.energy.ca.gov/publications/searchReports.php>

