C S I R D & D P r o g r a m

Improved PV Production Technologies

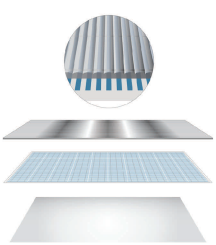
The improved PV production technologies focus includes testing and demonstration of new solar technologies and strategies with improved performance/reliability or lower costs. The projects funded in this focus area aim to demonstrate the viability of distributed concentrating PV (CPV), PV and solar thermal, and combining PV with energy storage. The current market place lacks data on the reliability and long term performance of new and innovative systems to allow for financing of these projects. Providing long term performance data and information to establish the bankability and reliability will enable confidence with adoption of PV technologies in the distributed generation market.

Solaria: Proving Performance of the Lowest Cost PV System

Solaria Corporation

Partners: PG&E

This Solaria project seeks to overcome the primary obstacle to wide-scale deployment of its PV technology in that the financial community will only invest in projects that use solar technology with a history of proven performance. To overcome this barrier, the Solaria team is conducting demonstrations at two California sites (Fremont and Dublin). The Fremont demonstration at the Solaria manufacturing facility is a 110 kWp tracking system. The second system, installed at the Alameda County Santa Rita Jail, is testing and comparing three types of tracking systems with Solaria modules: single axis, dual axis, and polar axis. These tests may support further cost and performance comparisons by validating the optimum tracker technology with Solaria modules. The data and results from these demonstrations will support the reduction of risk by investors finance these projects, thereby accelerating the deployment of solar in California .

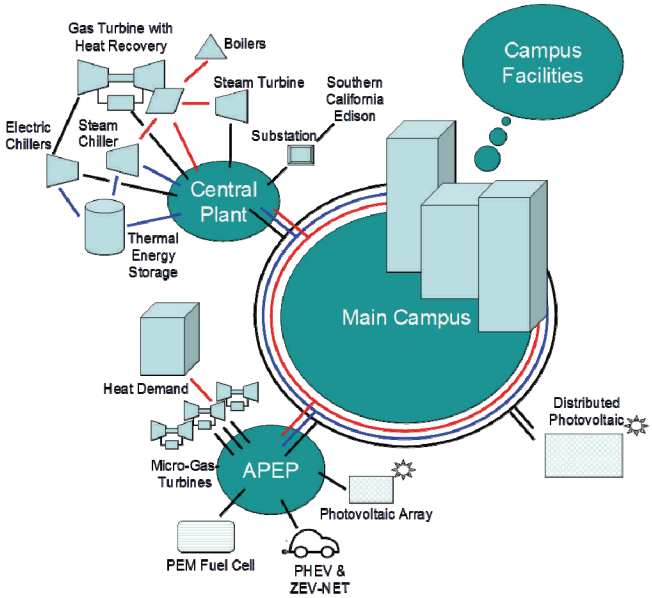


PV and Advanced Energy Storage for Demand Reduction

Amonix, Inc.

Partners: UC Irvine APEP, NREL, SCE

The Amonix project is working to decrease costs and expand the market adoption of high concentration photovoltaic (HCPV) systems. The Amonix team is monitoring the performance of two 53 kW HCPV systems and associated circuits on the University of California, Irvine electric infrastructure. Metered data and associated models are being used to evaluate and compare grid interconnection and energy management strategies. The team is also look at how to correlate measured weather data with accelerated testing in order to predict lifetime and reliability validation that will help to secure financial investments for future HCPV system deployment.



C S I R D & D P r o g r a m

Improved PV Production Technologies

PV and Advanced Energy Storage for Demand Reduction

SunPower Corp.

Partners: KEMA, Sandia National Lab, Kohl's Stores, UCSD, Ice Energy, ZBB Energy, PG&E

The SunPower project is demonstrating the integration of advanced energy storage systems in combination with existing PV systems at customers' sites. Two energy storage systems are being demonstrated at two sites - the University of California, San Diego campus and Kohl's Store in Redding, California.

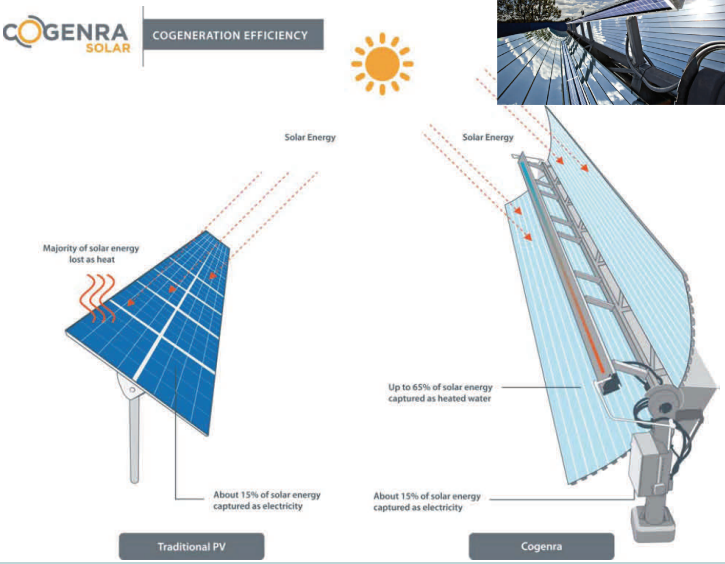
The SunPower team is assessing whether the combination of PV and energy storage is of higher value to the customer and utility than either one alone considering time-of-use rates and a demand response tariff, under actual operating conditions. In addition, they are evaluating the capabilities, reliability and potential degradation of the storage technologies and the ability of the storage technologies to respond to actual or simulated demand response events. This research will provide valuable information regarding the coupling of energy storage with PV in terms of both the economics and the reliability of storage technologies.

Improved Manufacturing and Innovative Business Models to Accelerate Commercialization in California of Hybrid Concentrating Photovoltaic/Thermal Tri-generation (CPV/T-3G) Technology

Cogenra

Partners: Sonoma Wine Company, Patch Engineering, PG&E

Cogenra has developed, prototyped and validated the performance of a concentrating PV (CPV) and thermal co-generation technology. For this project they conducted an 80 kW demonstration of their technology at the Sonoma Wine Company. Improved manufacturing and assembly methods were developed and demonstrated at subsequent sites including the Kendall Jackson Winery site and a Southern California Gas Company testing site. The field performance of the systems were measured and used to refine economic and financial models. The Cogenra team developed an Energy Purchase Agreement business model to facilitate third-party financing for these systems. The solar co-generation system was modified to support tri-generation of electricity, heating and cooling. Tri-generation expands the market for this technology to commercial sites that require cooling and limited hot water. The system was modified to provide thermal energy storage for use during peak demand. The project was completed in January 2013.



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CSI RD&D website: *calsolarresearch.ca.gov*

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