



U.S. Department of Energy
**Energy Efficiency
and Renewable Energy**

Bringing you a prosperous future where energy
is clean, abundant, reliable, and affordable

DOE Solar Energy Technologies Program Peer Review

Denver, Colorado
April 17-19, 2007



- For over 25 years, the SERES has provided technical support, training, testing, and evaluation of PV systems and equipment to a variety of stakeholders such as consumers, installers, utilities, and state organizations. These services are provided to reduce barriers associated with the installation and use of PV systems.





- The SERES contract is divided into two main tasks
 - Photovoltaic System Assistance Center (PVSAC):
Develop a **national, one-stop resource** for
 - Public Policy Support
 - Workforce Development
 - Technical Support, Design Reviews, and Web Assistance
 - Field Testing, Instrumentation, and Data Monitoring
 - Integrate the staffs from both RESs to provide these services for the entire U.S. PV community.



- The SERES contract is divided into two main tasks
 - Photovoltaic Research and Development (PV R&D): Enhance PV implementation and use through applied research directed toward the following areas:
 - Long-Term Performance Testing of Inverters
 - Advanced Integrated Designs
 - PV Module Performance Testing
 - Long-Term Evaluation of PV Modules
 - PV on Disaster Relief Applications



- **PVSAC Board of Directors**
 - Jane Weissman: IREC
 - Arthur Rudin: Sharp Solar
 - Rhone Resch: SEIA
 - Mark Dougherty: Long Island Power Authority
 - Julia Judd: Solar Electric Power Authority
 - David Kulik: Sunwize Technologies
 - Richard Carson: Tennessee Valley Authority
 - Robert Broderick: Public Utility of New Mexico
 - Stephen Kalland: North Carolina Solar Center



- **Public Policy Support:**
Acceptance testing in the Virgin Islands
 - By demonstrating that high-quality PV systems could be installed in USVI, the VIEO made the case to the Water and Power Authority (WAPA), the local utility, that it was safe to interconnect PV systems to the grid.





- **Workforce Development**
 - The SERES conducted six weeklong training courses for PV installers at the Florida Solar Energy Center (FSEC). This weeklong course covers the design and installation of photovoltaic (PV) systems, and involves actual hands-on work with PV systems and equipment.





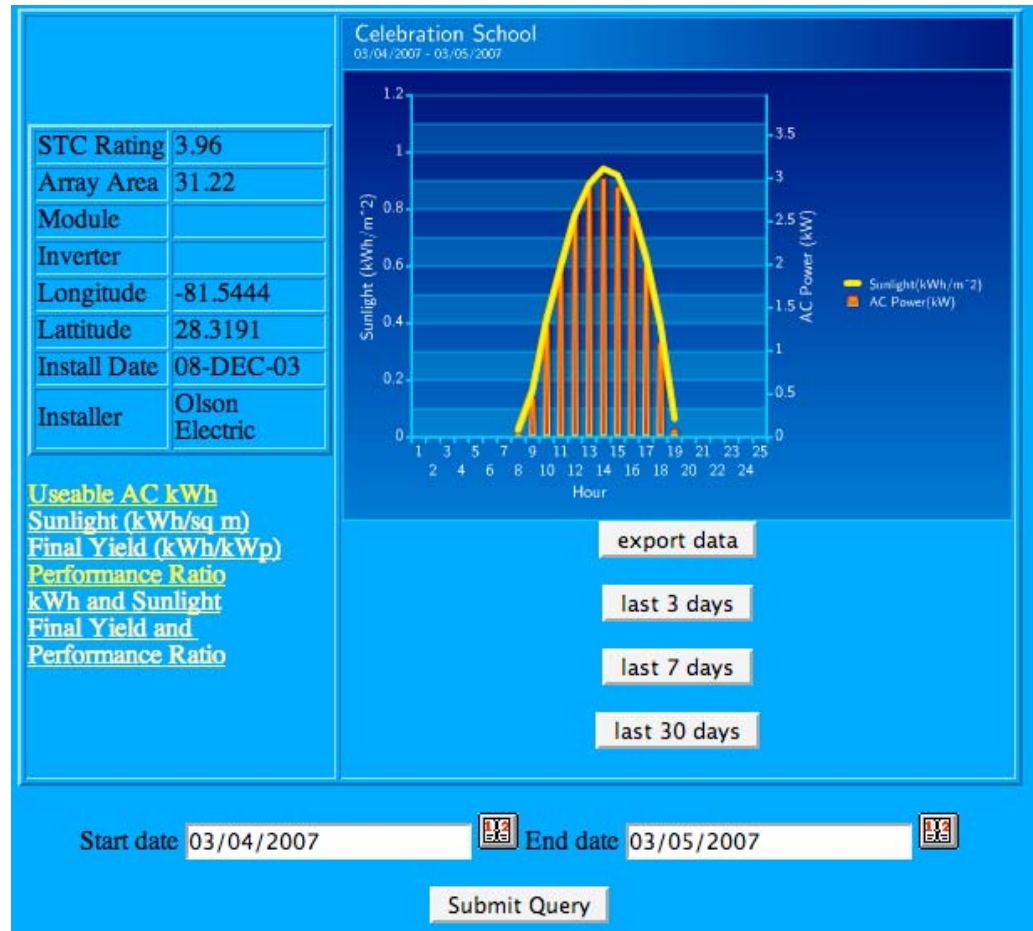
• Design Review

- The SERES at FSEC has developed a process to evaluate complete photovoltaic (PV) systems. It was developed in order to provide consumers, installers, and other stakeholders with a level of assurance that accepted systems have been well-designed and meet safety and quality requirements as detailed in this evaluation. Over 200 systems have been approved for Florida and the USDA’s Rural Utilities Service.

Sun Electronics 511 NE 15th Street Miami, FL 33132					
<i>Important Note:</i> <i>The Certified Systems listed on this page are complete PV system packages submitted for review by the listed company. Assembly of similar components, without approved documentation, does not constitute an approved system.</i>					
Sun Electronics		Sales Contact: John Kimball (305)536-9917		Technical Contact: Roger Messenger (561) 276-9447	
FSEC Certification Number	System Designation	Modules	Inverter	Battery	Array Nameplate Rating at STC (W)
SE-06-0101A	UPSUI2040S	Evergreen ES-170	Outback GVFX3648	Concorde PVX-1080T	2040
SE-06-0101B	UPSUI2550	Evergreen ES-170	Outback GVFX3648	Concorde PVX-1080T	2550
SE-06-0101C	UPSUI6120	Evergreen ES-170	Outback GVFX3648 (2)	Concorde PVX-1080T	6120
SE-06-0102A	UPSUI2040C	Evergreen EC-102	Outback GVFX3648	Concorde PVX-1080T	2040
SE-06-0103A	UPSUI2040CX	Evergreen EC-102	Xantrex SW5548	Concorde PVX-1080T	2040
SE-06-0104A	UPSUI2160	Evergreen ES-180	Outback GVFX3648	Concorde PVX-1080T	2160
SE-06-0104B	UPSUI6480	Evergreen ES-180	Outback GVFX3648 (2)	Concorde PVX-1080T	6480
SE-06-0105A	UPSUI2200	Evergreen EC-110	Outback GVFX3648	Concorde PVX-1080T	2200
SE-06-0106A	UPSUI2200X	Evergreen EC-110	Xantrex SW5548	Concorde PVX-1080T	2200
SE-06-0107A	UPSUI2280	Evergreen ES-190	Outback GVFX3648	Concorde PVX-1080T	2280
SE-06-0107B	UPSUI6840	Evergreen ES-190	Outback GVFX3648 (2)	Concorde PVX-1080T	6840
SE-06-0108A	UPSUI2400	Evergreen EC-120	Outback GVFX3648	Concorde PVX-1080T	2400
SE-06-0109A	UPSUI2400EX	Evergreen EC-120	Xantrex SW5548	Concorde PVX-1080T	2400
SE-06-0110A (FSPV-0247)	UPSUI2500	Kyocera KC-125G	Outback GVFX3648	Concorde PVX-1080T	2500
SE-06-0110B	UPSUI2500KX	Kyocera KC-125G	Xantrex SW5548	Concorde PVX-1080T	2500



- **Field Instrumentation and Monitoring**
 - The SERES continues to monitor about 40 grid-connected PV systems located mainly in Florida. Both RES's served to represent the US in the International Energy Agency PVPS Task 2 where we supported their database by supplying them detailed data on the performance of 28 of the systems we monitor.



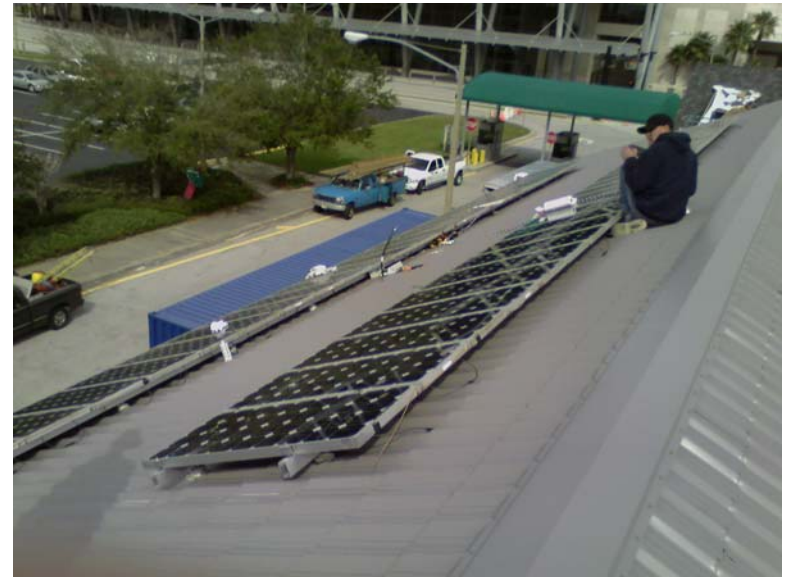


- Long-Term Performance Testing of Inverters
- Data has been collected from three inverters being tested at FSEC: the Fronius IG 3000, the Xantrex 3.0, and the SMA 2500U. The inverters all use the same PV modules in the same orientation at approximately the same power input in order to better compare results. Early results of this work are published.





- **Advanced Integrated Designs**
- Working with the Building America program to help modular homebuilders integrate PV systems into their building designs. We provided technical assistance to Palm Harbor Homes to help them integrate a 4 kW PV system into a two-story home built for display at the International Builders Show in Orlando, FL. Approximately 150,000 people attended the show.



QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.



- **PV Module Performance**
- This year the SERES has tested 15 modules from companies including Sanyo, Sharp Solar, Solarworld, and Sunwize using both indoor and outdoor testing procedures as set out by standards adopted by FSEC. Certification of these modules allows them to be sold in the Florida market.





- **PV For Disaster Relief Applications**
- The State of Florida has extended its SunSmart Schools program, a rebate for selected schools to purchase PV systems and incorporate an educational program into their curriculum. One of the schools, Middleton Middle School in Tampa, Florida, is a disaster shelter and applied for funding for a 10 kW PV with battery back up to supply power for emergency loads.





Southeast Region Photovoltaic Experiment Station	Total Value
January 2005 – December 2005 (carryover funds spent until June 2006)	\$1,000,000
January 2006 – December 2006 (funding awarded July 2006, carryover until May/June 2007)	\$875,000
Grand Total (two years)	\$1,875,000



- Continue to work closely with our Board of Directors to make sure we better support the public and private industry. This may include focusing more in certain areas and downplaying our role in others.
 - Possible Example: More emphasis in supplying technical support to States. Less emphasis in policy making.



- Maintain our accreditation to ISO 17025 for PV module performance testing and design review and approval.
 - Continue evaluation of PV module performance
 - Support DOE testing and evaluation (T&E) work as it relates to the SAI TPP
 - Support DOE MT PV module performance



- Continue working with the Building America program to look for new partners and new ways to integrate PV into buildings
 - Modular home builders are a relatively new market for the solar industry
 - Great advantage for cost reduction, particularly in the installation costs

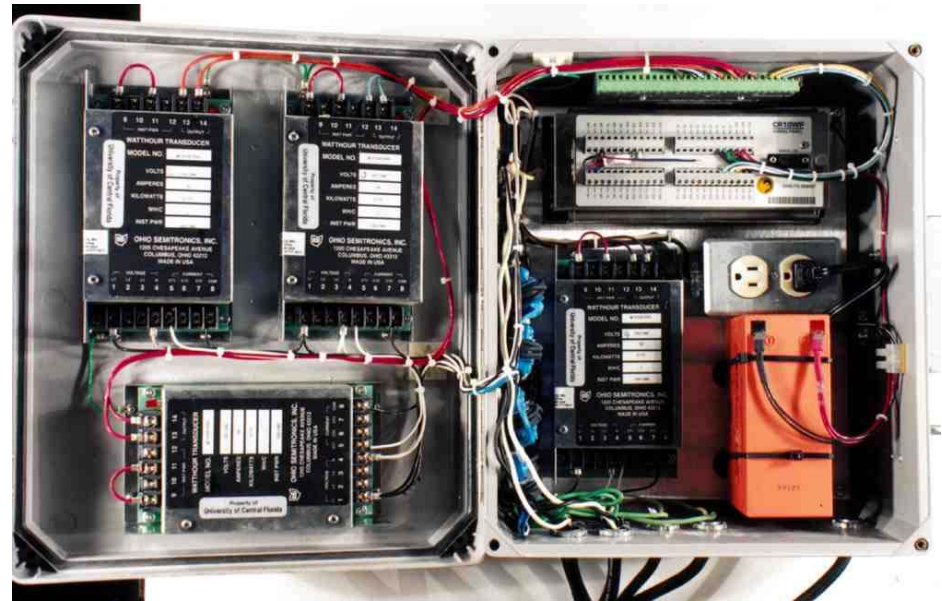


- Double the size of the long-term inverter test bed
 - Expand from 10 kW to 20 kW
 - Expand from four to eight inverter slots making room for future T&E work with DOE





- Field Testing
 - Start applying ISO17025 test procedures to systems monitored in the field
 - Responding to future DOE T&E requests





- Create a PVSAC Web Site including
 - Monitoring and evaluation of PV systems
 - Training via the internet
 - Training materials for community colleges and other institutions
 - Example site surveys, acceptance tests, and other information to help states implement PV programs