

## CERC Accomplishments

- Awarded over \$15 million in contracts and grants over the past 10 years.
- Developed the nation's first 20,000 watt solar / electric charging station for electric vehicles.
- Achieved a world record efficiency (15.8%) for thin film cadmium telluride solar cells for low cost applications.
- Developed the Rivolta Isigo neighborhood electric vehicle.
- Created a mobile data acquisition system for the U.S. Department of Energy EV Site Operator Program.
- Constructed a microturbine power plant fueled by landfill gas at the Hillsborough Heights Landfill in Tampa.
- Developed photocatalytic technology for detoxification and disinfection of water and indoor air.



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## KEY RESEARCH PROJECTS

### Power Production

- ◆ Photovoltaic (PV) Technology and Systems
- ◆ Solar Thermal (CPS) Power for Bulk and Distributed Generation

### Energy Storage

- ◆ Thermal Storage for Utility Scale Applications
- ◆ Ultracapacitor and Battery Technology
- ◆ Hydrogen Storage in Polymers and Metal Hydrides

### Smart Grid Power Systems

- ◆ Renewable Energy (RE) Grid Integration
- ◆ Microgrid Management
- ◆ Power System Dynamics and Simulation
- ◆ Smart Grid Control, Computing and Communications

### Photocatalytic Technologies

- ◆ Detoxification and Disinfection of Water and Air

### Water Production

- ◆ Solar water desalination and Distillation

### Advanced Technologies

- ◆ Antenna Solar Energy Conversion
- ◆ Combined Power/Cooling Thermodynamic Cycle
- ◆ Thermochemical Production of Liquid Fuels from Biomass
- ◆ Carbon Capture and Sequestration

### Transportation Technologies

- ◆ Electric/Hybrid Vehicles
- ◆ Energy Management



**Clean Energy Research Center**

University of South Florida

*A leader in innovative energy systems leading to alternative energy strategies, improving energy efficiencies, and expanding the economic development for Florida.*



*CERC's 20,000 watt solar photovoltaic electric charging station .*

## CERC Mission

Florida has no substantial indigenous supply of fossil fuels, resulting in the state importing most of the energy it uses. The “Sunshine State” does have abundant solar and biomass resources. Solar and hydrogen resources and technologies, applied both electrically and thermally, can mitigate fossil fuel dependency, improve the environment, and provide the opportunity for substantial economic growth.



*CERC's concentrating solar thermal pilot power plant as R+D tool and teaching vehicle.*

CERC's mission is scientific R + D, infrastructure development and information transfer. Collaboration with energy producers and the transportation sector, supports the economic development of manufacturing and high technology businesses, enhancing the nation's goal of global competitiveness and technology leadership.

## Smart Grid Power Systems

**A new thrust area for CERC is “Smart Grid Power Systems” (SPS) which aims to train the next generation of power professionals by promoting excellence in electric power education and research, by developing enabling smart grid technologies. SPS partners include industry, academia, and utilities.**

### SPS research includes:

- ◇ **control, communications and computing in smart grids;**
- ◇ **renewable energy grid integration;**
- ◇ **smart microgrids energy management;**
- ◇ **energy delivery technologies (HVDC, HVDC-light);**
- ◇ **power systems dynamics and simulation;**
- ◇ **real-time system monitoring; and demand side response.**

### CERC Scientists

CERC spans the Engineering departments of Electrical, Chemical and Biomedical, Mechanical, Computer, Materials Science, as well as in the College of Arts and Sciences. Visiting scholars come from around the world to receive specialized training only available at the CERC.

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