Clean Energy Research Center . . . *Clean energy is green and renewable.*

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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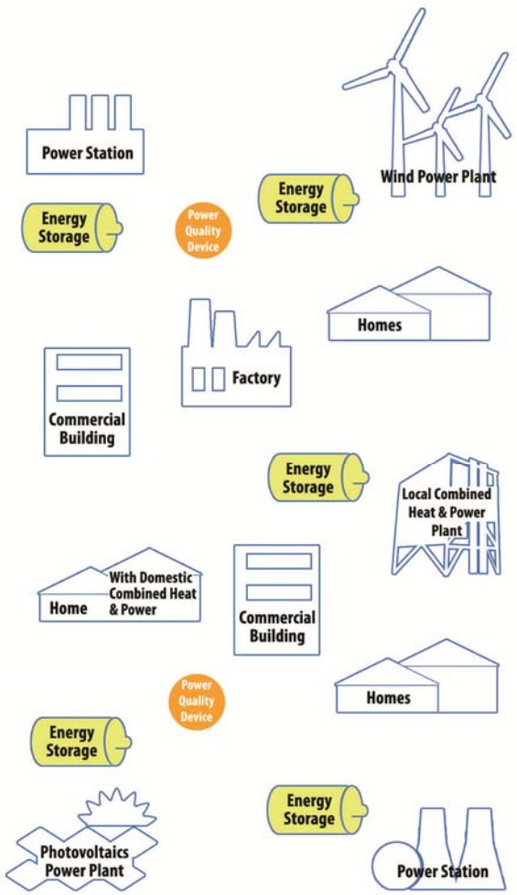
CERC MISSION

Florida has no substantial indigenous supply of fossil fuels. As a result, the state must import virtually all of the energy it uses. However, Florida (known as 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 is involved in fundamental investigations into new environmentally clean energy sources and systems — hydrogen, fuel cells, solar energy conversion and biomass utilization.

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

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COLLEGE OF ENGINEERING

Smart Grid Power Systems (SPS)

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 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.

SPS' partners include industry, academia, and utilities.

CERC Scientists

Within the USF, the CERC spans the Engineering departments of Electrical, Chemical and Biomedical, Mechanical, Computer, Materials Science, and also within Arts and Sciences. Visiting scholars come from around the world to receive specialized training only available at the CERC.

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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

http://cerc.eng.usf.edu

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New environmentally clean energy sources and systems for the world.

- Synergies of Technologies Working Together
- Increased Energy Security and Power Quality
- Reduce Greenhouse Gas Emissions
- Renewable Generation and Distributed Energy Storage
- Improved Reliability
- Enhanced Outage Management Systems
- Redistribution of Load
- Interfacing Renewable Energies to the Utility Grid
- Biomass Power Production