

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.



Clean Energy Research Center
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Research and Development Focus Areas

Clean Energy and Systems

- Solar energy
- Thin film solar cell
- Photovoltaic and hybrid systems
- Hydrogen fueled systems
- Biomass derived fuel and systems

Distributed Energy Production

- Fuel cells
- Microturbines
- Landfill gas utilization
- Energy management systems
- Solar roof top systems
- Cost analysis

Energy Storage

- Hydrogen production and storage
- Battery technology
- Hydrogen liquefaction
- Underground natural gas and landfill gas storage

Transportation Technology

- Electric / hybrid vehicles
- Fuel cells
- Vehicle operational testing
- Infrastructure development
- Energy management

Editorial Office

- International Solar Energy Society's technical journals: *Solar Energy* and *Advances in Solar Energy*

*New environmentally clean
energy sources and systems
for the world.*

CLEAN ENERGY RESEARCH CENTER



USF UNIVERSITY OF
SOUTH FLORIDA



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

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



Prof. Lee Stefanakos overseeing the recharging of USF's fleet of electric vehicles.

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.

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.

CERC is involved in fundamental investigations into new environmentally clean energy sources and systems — hydrogen, fuel cells, solar energy conversion and biomass utilization — that meet the needs of both the electric power and transportation sectors.

Key Research Projects

- Photovoltaic Thin Film CdTe, CIS, CIGS Technologies
- Photocatalytic Detoxification and Disinfection
- Solar Thermal Power
- Hydrogen Storage in Metal Hydrides and Complex Hydrides
- Combined Power/Cooling Thermodynamic Cycle
- Antenna Solar Energy Conversion
- Hydrogen Production through Splitting of Water by Photoelectrolysis
- Thermochemical Hydrogen Production from Solar Energy and Biomass
- Thermochemical Production of Liquid Fuels from Biomass
- Carbon Capture and Sequestration
- Solar Water Desalination and Distillation



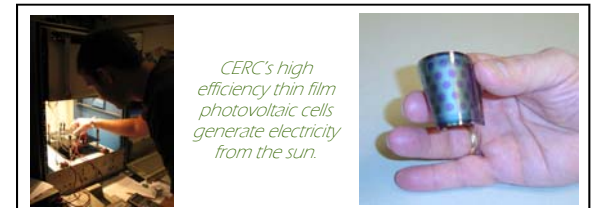
Reaching for the Sun



Prof. Yogi Goswami is experimenting with the thermodynamic power/cooling combined cycle.

CERC Scientists

Within the University of South Florida, the CERC spans the Engineering departments of Electrical, Chemical and Biomedical, Mechanical, Computer, and Materials Science. Visiting scholars come from around the world to receive specialized training only available at the CERC.



CERC's high efficiency thin film photovoltaic cells generate electricity from the sun.

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