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%) 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.

CERC will achieve its mission and future accomplishments through scientific research, technical development, infrastructure development and information transfer. Collaboration with energy producers and the transportation sector will support the economic development of manufacturing and high technology businesses as well as the nation's goals of global competitiveness and technology leadership.

CERC R&D FOCUS AREAS

Clean Energy and Systems

♦ Solar energy
♦ Thin film solar cell R&D
♦ Photovoltaic and hybrid systems
♦ Hydrogen fuelled 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

CERC EDITORIAL FOCUS AREAS

♦ Editorial Office for *Solar Energy Journal* (International Solar Energy Society)
♦ Editorial Office for *Advances in Solar Energy* (American Solar Energy Society)

CLEAN ENERGY RESEARCH CENTER

at the

USF UNIVERSITY OF SOUTH FLORIDA

20,000 watt solar/electric charging station

"New environmentally clean energy sources and systems."

CERC MISSION

The mission of the Clean Energy Research Center (CERC) at USF is to develop, evaluate, and promote the commercialization of 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. This mission is accomplished through multidisciplinary research, technical and infrastructure development, and information transfer.

Dr. Lee Stefanakos with electric vehicle power station.

CERC supports regional economic development of manufacturing and high technology business in conjunction with national goals of improving global competitiveness and technological leadership.

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.

KEY RESEARCH PROJECTS

- Photovoltaic Thin Film Technology
- Photocatalytic Bacteria Destruction
- Hydrogen Storage in Metal Hydrides and Complex Hydrides
- Fuel Cell Conversion of Feedstock to Electricity
- New Combined Power/Cooling Thermodynamic Cycle
- By-Product Hydrogen Production with an Electrochemical Cell (reverse fuel cell)
- Electrochemical Catalytic Cell for the Production of Hydrogen from Various Fuel Stocks
- Hydrogen Sensors for Fuel Cell Applications
- Antenna Solar Energy Conversion
- Hydrogen Production through Splitting of Water by Photoelectrolysis
- Thermochemical Hydrogen Production
- Biomass Hydrogen Production

Dr. Yogi Goswami with combined power/ cooling thermodynamic cycle.

USF

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