

CERC ACCOMPLISHMENTS

Received over \$8 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

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.



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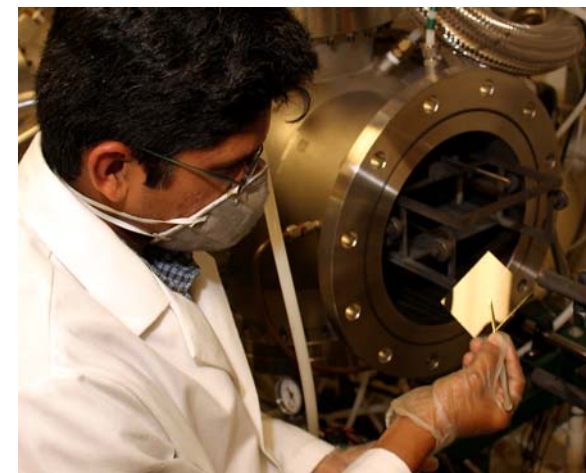


"Engineering A Better Tomorrow"

CLEAN ENERGY RESEARCH CENTER

at the

University of South Florida



"New environmentally clean energy sources and systems"



CERC MISSION

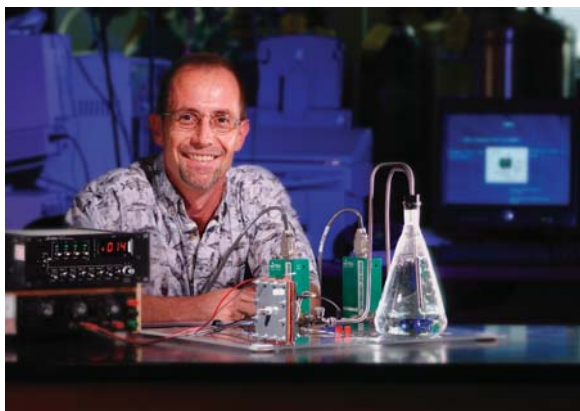


The mission of the Clean Energy Research Center (CERC) in the College of Engineering is to develop, evaluate, and promote the commercialization of new environmentally clean energy sources and systems, like hydrogen, fuel cells, solar energy conversion, and biomass utilization that meet the needs of both

the electric power and transportation sectors through multi-disciplinary research, technical and infrastructure development, and information transfer.

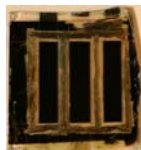
CERC supports regional economic development of manufacturing and high technology business in conjunction with our national goals of improving our global competitiveness and technological leadership.

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 good solar and biomass resources. Solar and hydrogen resources/technologies, applied both electrically and thermally, can mitigate the state's fossil fuel dependency, improve the environment and provide the opportunity for substantial economic growth.



Above: Dr. John Wolan is investigating fuel cells that use hydrogen as a source of fuel. Top left: Dr. Burton Krakow is developing electrochemical cells that generate hydrogen using electricity or light.

CERC R&D FOCUS AREAS



This page: Solar cell/thin film technology is being developed by CERC researchers to utilize the sun's energy more efficiently.

Clean Energy and Systems

- Solar energy
- Think 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

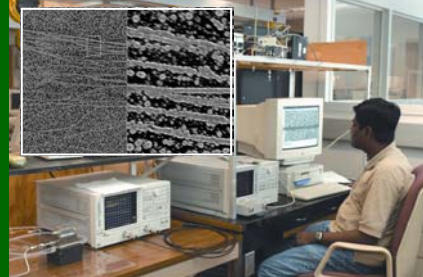
Energy Storage

- 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

Nanowires (inset) are playing an integral role in hydrogen sensor development; Deepak Srinivasgupta is shown evaluating an SAW sensor in Dr. Venkat Bhethanabotla's lab.



KEY RESEARCH PROJECTS

By-Product Hydrogen Production with an Electrochemical Cell (reverse fuel cell)

Electrochemical Catalytic Cell for the Production of Hydrogen from Various Fuel Stocks

Prototype and Simulation Model for a MEMS Magneto-Caloric Refrigerator

Hydrogen Cryogenic Storage Systems

Hydrogen Sensors for Fuel Cell Applications

Rectenna Development

Solid-State Fuel Cell for High Power Applications

Photovoltaic Thin Film Technology Production of Energy from Biomass

Photocatalytic Bacteria Destruction in Air Handling Applications



The solar energy charging station, designed, developed and built by CERC consists of a parking/charging facility for 12 electric vehicles providing up to 20 kilowatts of peak power.