FSEC Advisory Board Meeting — AGENDA

10:00 a.m.	Welcome and Introductions • Ask if anyone not called.	Mike Faas, Chair	Roll Call [Sherri] Name, Title and Affiliation
10:10 a.m.	Approval of November 18, 2019 Meeting Minutes	Mike Faas, Chair	Mike asks for any discussion. Any "nays"? Silence is agreement.
10:15 a.m.	Board Business ▪ Election of Chair and Vice-Chair	Mike Faas, Jim Fenton	One nomination for Vice Chair, Bill Grieco. Any others?
10:30 a.m.	Status of FSEC Programs	Jim Fenton	
10:50 a.m.	Florida Energy Office Report Florida Legislative Session Report	Kelley Smith Burk Louis Rotundo	
11:05 a.m.	Review and Adoption of FSEC Strategic Plan	Chris Castro & Task Force (Bill Grieco Mike Faas, Tom Lawery, Louis Rotundo, Jennifer Szaro)	Open mics to Task Force. Attendees type questions into CHAT.
11:55 a.m.	Date and Agenda for Next AB Meeting (TBD)		
12:00 p.m.	Adjourn		

The State of FSEC

James Fenton

Advisory Board Meeting

April 16, 2020

FSEC Energy Research Center

UNIVERSITY OF CENTRAL FLORIDA


Working Together!
REMOTELY.

FSEC COVID19-Related Issues

- All except essential facility personnel working remotely
- Lab work halted
- Funding agencies authorizing delays
- Longevity of delay will determine impact on FSEC & UCF financial position
- Discussing with DOE and LBNL on ventilation-related lab experiments for keeping family healthy with sick person at home using PM2.5 generator and measurement.
- Using GoToMeeting and ZOOM for video conferencing from homes

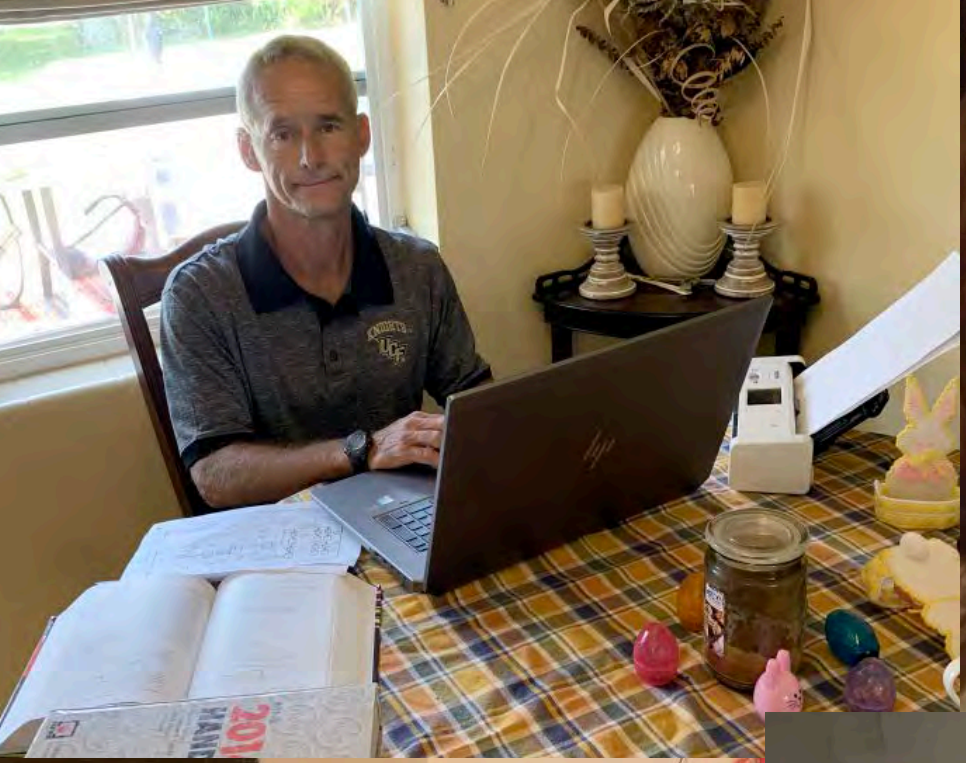


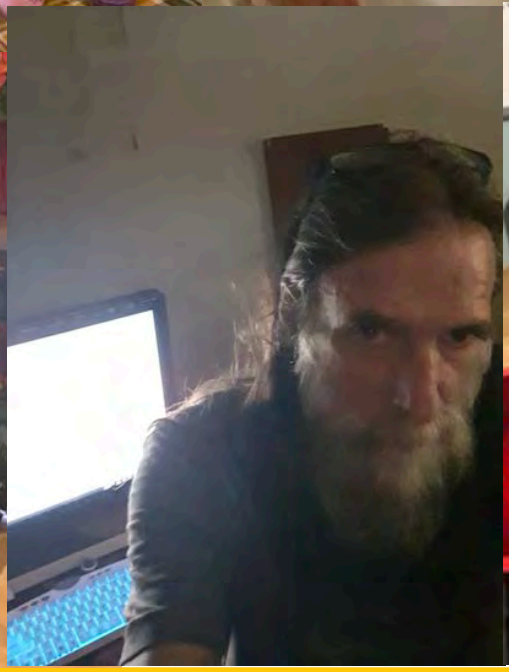



FSEC
Residential
Energy Code
Compliance
4 CILB CEU

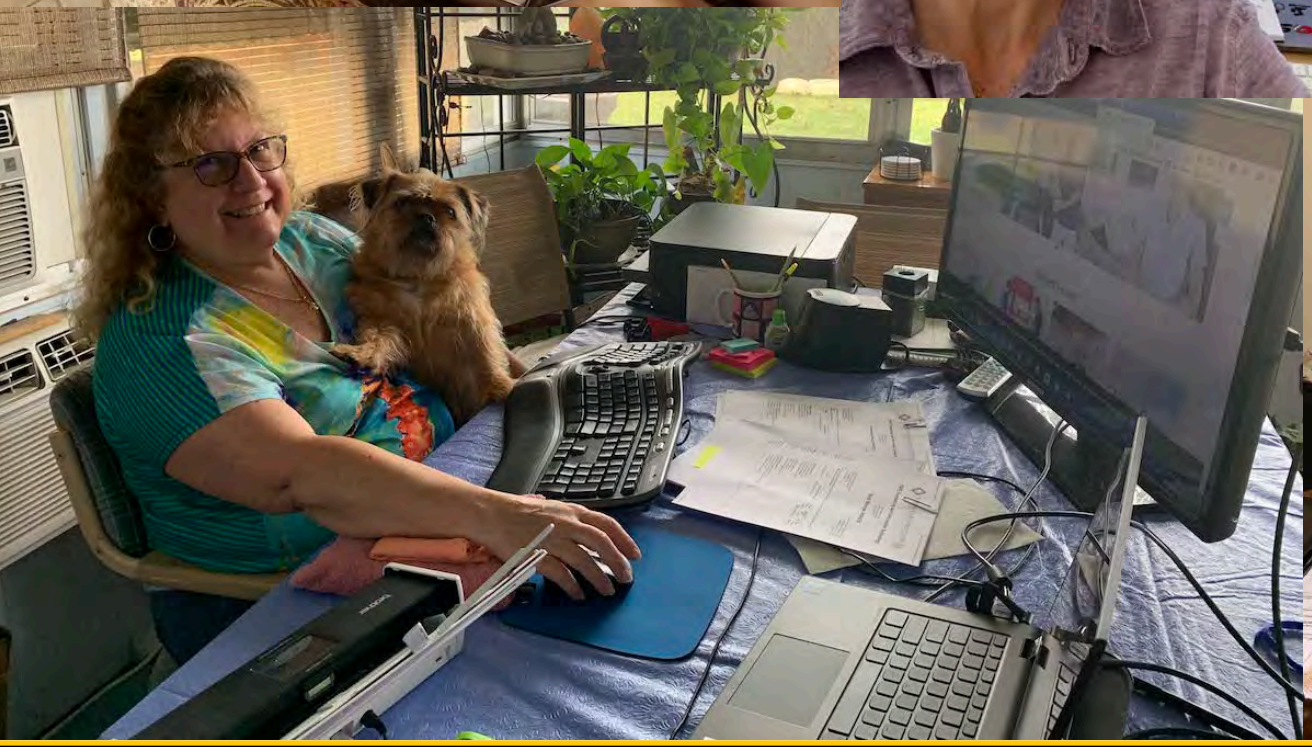

OFFLINE

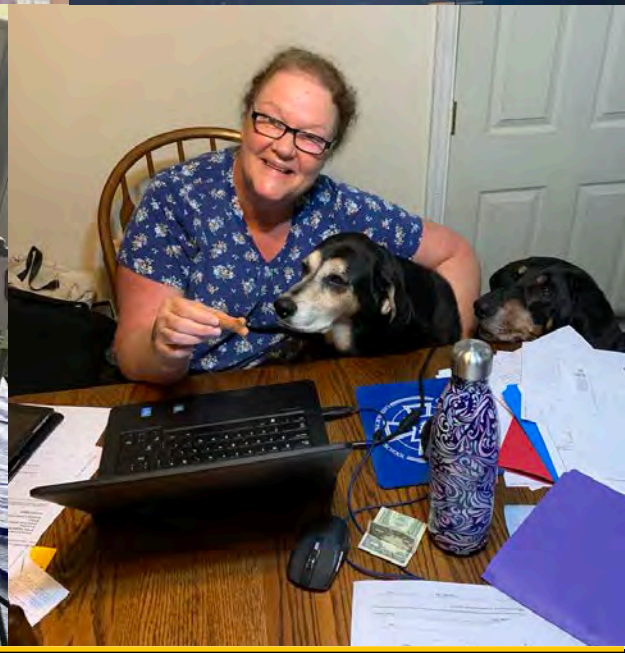

Working Together






LEGION





Energy & STEAM Education

FSEC IN THE NEWS

https://www.bradenton.com/article241063881.html

Big changes are coming to this Bradenton middle school, but not without debate

By Giuseppe Sabella
March 11, 2020 02:39 PM, Updated March 11, 2020 06:14 PM

…Board member Scott Hopes and board Chair Gina Messenger voted against the provisions, citing the need for more research and planning. Hopes wanted board members and district administrators **to visit the Florida Solar Energy Center at the University of Central Florida**.

"Which, among other things, has done significant things around energy efficiency in schools," Hopes said.

He said they could learn from UCF researchers and tweak the standards approved on Tuesday, if need be….

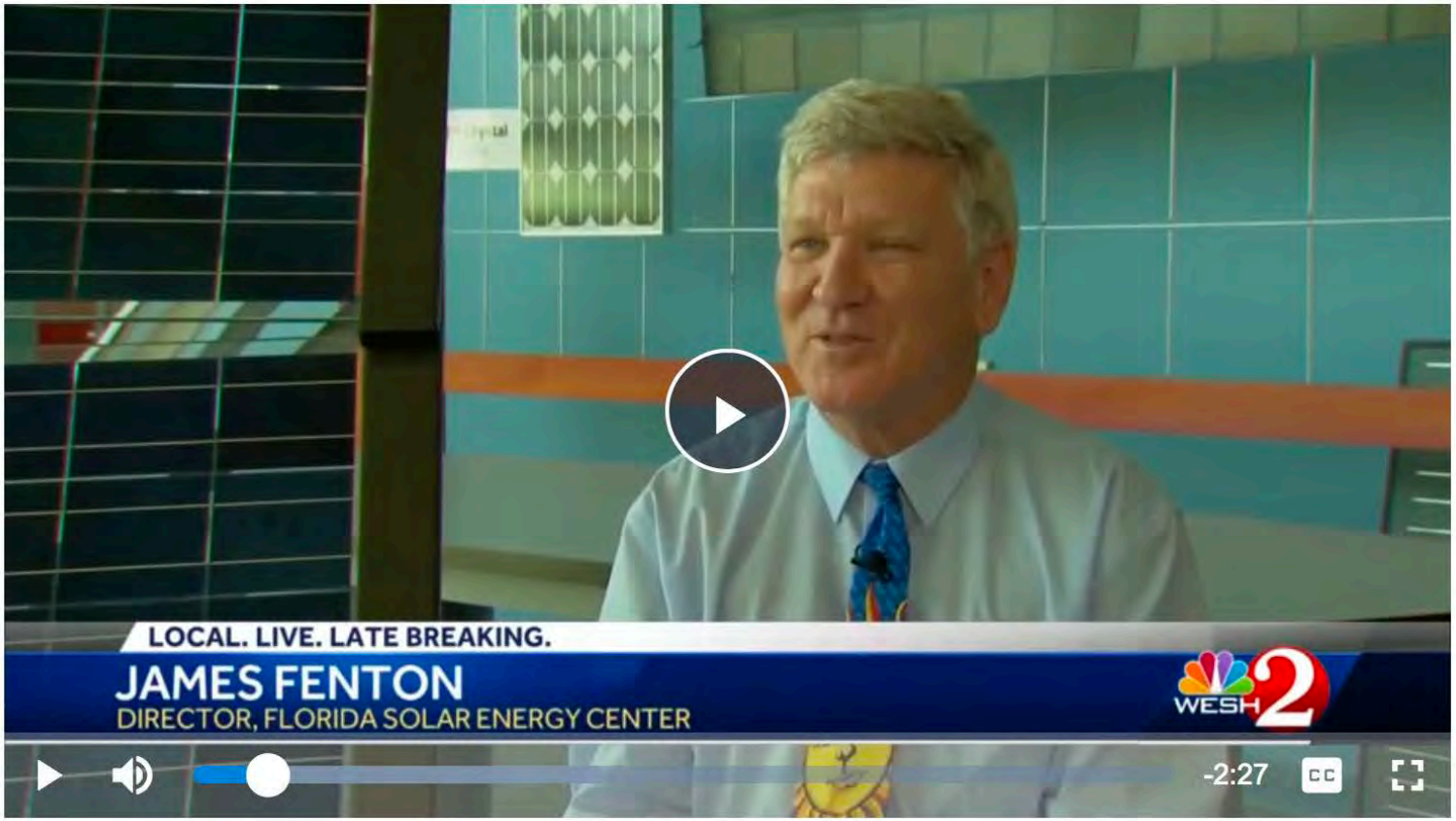
Experts: Solar energy offering cheaper, cleaner energy alternative for Floridians

52 Shares

WESH 2 Updated: 9:07 PM EST Dec 6, 2019

Kelsi Thorud
Reporter

https://www.wesh.com/article/experts-solar-energy-offering-cheaper-cleaner-energy-alternative-for-floridians/30155785



UCF

CURRENT CONTRACTS

Current DOE-Funded Collaborative Partnerships

- **Fabrication of Passivating Contact Solar Cells,** *K. Davis*
- **PV System Research Impacting LCOE**, *J. Walters*
- **Reliability and Power Degradation**, Sub from CWRU*, K. Davis*
- **Characterization of Contact Degradation in c-Si PV Modules**, *K. Davis*
- **Low Cost Printing Techniques***, K. Davis*
- **Solar Energy Innovator Program,** *Paul Brooker at OUC*
- **Quantifying and Valuing Fundamental Characteristics and Benefits of Floating Photovoltaic Systems,** *J. Sherwin*

Current DOE-Funded Collaborative Partnerships

- **Investigation of the Prevalence and Energy Impacts of Residential Comfort System Faults – Hot Humid and Hot Dry Climates,** *E. Martin*
- **PV-GEMS: Photovoltaic Powered, Grid Enhanced Mechanical Solution,** *E. Martin*
- **Indoor Air Quality Field Study in New US Homes,** *E. Martin*
- **Energy Codes: Comparing Performance in a Changing Technological Environment,** *P. Fairey*

Current Contracts

ADI AIR DISTRIBUTION INSTITUTE
MANUFACTURING EXCELLENCE

- Lab Home Measurement of Space Conditioning Energy Use with Flexible and Metal Duct Systems

American Chemistry Council℠

- Survey of Unvented Attics in Climate Zones 2-3

ASHRAE®

- Estimating Internal Moisture Generation Rates in Occupied New Homes

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES EST. 1868

- Alternative Fuel Resiliency Plan
- SunSmart Schools E-Shelter Maximization Project

ASU Arizona State University

- Reliability Evaluation of Bifacial and Monofacial Glass/Glass Modules with EVA and Non-EVA Encapsulants

Associated Gas Distributors of Florida

- Updating AGDF Model Costs and Equipment

ATLANTIC HOUSING PARTNERS

- Calculate Multifamily Utility Allowances and Support Existing PV Operations and New Installations

Current Contracts

The Levy Partnership

- *[Sub-Award]* Maximizing the Effectiveness of Ductless Heat Pumps in Existing Homes by Demonstrating Integrated Controls

NREL Transforming ENERGY

- Residential Buildings Subject Matter Expert Technical, Outreach and Research and Development Support

PNNL

- DOE Connected Heat Pump Water Heater Field Study

NSF

- Enabling large-scale adaptive integration of technology hubs to enhance community resilience through decentralized urban food-water-energy nexus decision

RESNET RESIDENTIAL ENERGY SERVICES NETWORK

- Technical Support

Sandia National Laboratories

- PV Lifetime Hot and Humid Climate Flash Testing

ICC-SRCC SOLAR RATING & CERTIFICATION CORPORATION

- SRCC Portal Development

SEI Associates

- Trane Trace 3D Plus Software Development Support

Tactical Energy

- Comparison of Real World Assisted Living Buildings with Baseline Models

UCF

RECENTLY AWARDED AND PENDING CONTRACTS

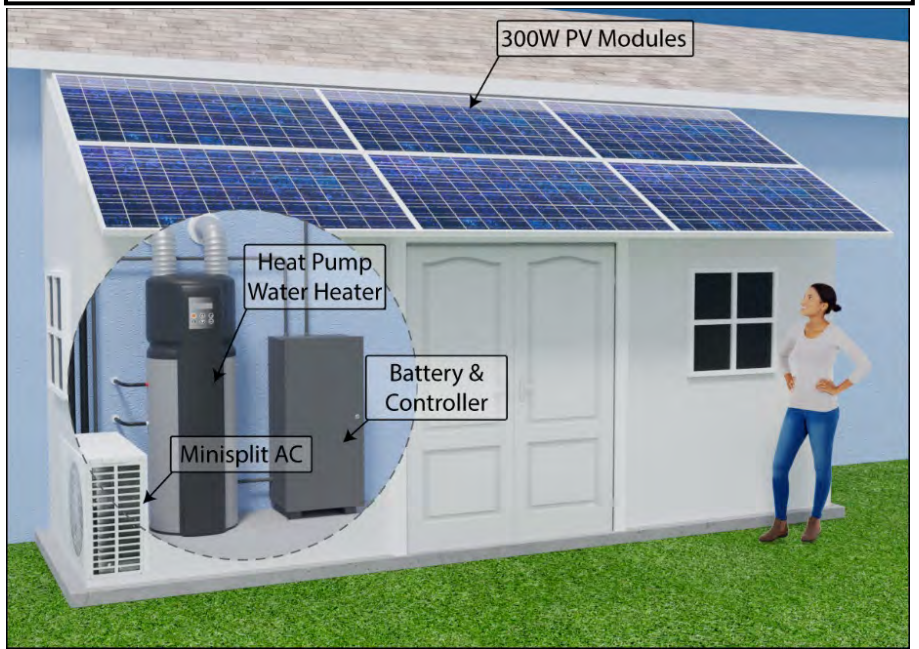
Selected for Award — Contract Negotiation Underway

PV-GEMS: Photovoltaic-powered, Grid-enhanced Mechanical Solution.

Eric Martin / University of Central Florida

Technology Summary

- **A pre-packaged retrofit solution targeting 75% reduction in space conditioning and water heating energy.**
- **Integrates highly efficient heat pump water heater and mini-split heat pump, both directly powered by an off-grid system of PV and newly developed micro-inverters.**
- **Grid energy can assist when PV resources are low, and excess PV can be stored in a battery.**



Key Personnel

Carlos Colon – FSEC
Jeff Sonne – FSEC
Ankur Maheshwari – Rheem

	Key Milestones & Deliverables
Phase 1	• Proof of concept including achievement of energy savings goals.
Phase 2	• Complete enclosure design and fabrication w/ Rheem. • Demonstrate on 5 occupied homes.

Technology Impact

- **Coupling current state-of-the-art with new innovations is expected to result in achievement of the 75% target energy use reduction.**
- **When scaled, this exceeds 1,800 Tbtu of total technical potential when applied to housing stock in all climates except very cold.**

U.S. DEPARTMENT OF ENERGY

Selected for Award — Contract Negotiation Underway

Reimagining HVAC for New Manufactured Housing

Dave Chasar / University of Central Florida

Technology Summary

- **Evaluate, refine, and field test new approaches for delivering efficient space heating and cooling in manufactured homes**
- **Engage industry stakeholders in feasibility assessments of innovative duct design, installation and testing plus implementation of ductless heat pump applications**
- **Estimate energy savings & cost effectiveness using building modeling software**

FSEC's Manufactured Housing Lab

Key Personnel

Scott Pigg (PI) – Slipstream Group, Inc
Janet McIlvaine – FSEC
Michael Lubliner – Washington State University

	Key Milestones & Deliverables
Phase 1	• Stakeholder engagement • Feasibility assessment
Phase 2	• Cost effectiveness analysis • Proof of concept testing and field trials

Technology Impact

- **Transform HVAC system efficiency throughout the US, HUD-code manufactured housing sector**
- **Reduce duct leakage by 75% and heating and cooling systems by 30% in new manufacture homes**

U.S. DEPARTMENT OF ENERGY

Demonstration of Integrated Hydrogen Production and Consumption for Improved Utility Operations

Total Project Budget $9.0M, 04/01/20 – 04/30/23

Integrated Hydrogen Production and Consumption for Improved Utility Operations

GINER ELX

Project Objectives

- Develop integrated system incorporating PEM-based electrolysis for H_2 production/storage and H_2-fuel for refueling of FCEVs
- Electricity generation with site-specific PEM-based stationary fuel cells
- Develop/Optimize dispatch models based on grid-level optimization controls

Impact

- Deployment of **Grid-Integrated Hydrogen assets** creates a system capable of leveraging intermittently available low-cost electricity to produce hydrogen for use in FCEVs, back-up power, and grid operational use cases
  - Ensures that the hydrogen is produced at the lowest electricity cost, and then consumed for the greatest possible value
  - Develops business models for OUC or other utilities, where the utility provides both electricity and hydrogen fuel, either as a grid asset of to support the transportation sector

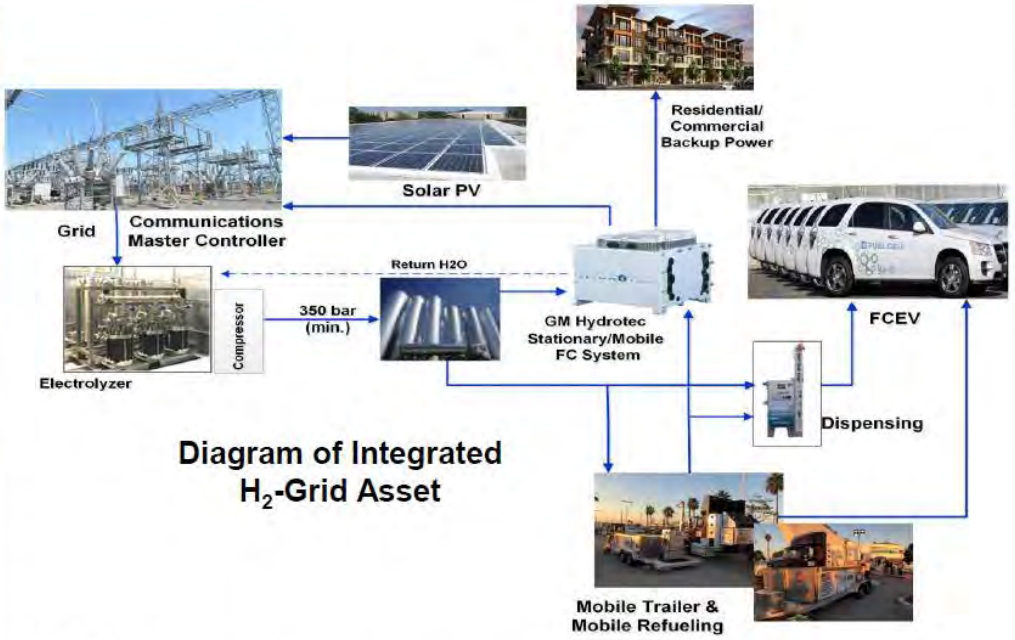


Diagram of Integrated H_2-Grid Asset

Partners

Orlando Utilities Commission (OUC) – Utility Co. / Solar Integration / FC Vehicles
General Motors – Stationary FC Systems
OneH2 – Storage, Compression, & Dispensing
UCF-FSEC – Techno-Economic Analysis, Solar to H2 Optimization
Giner ELX, Inc. – Electrolyzer System Development & Assy

Proposals PENDING – $4.5M

- **Photovoltaics for Primary and Secondary Schools** – Directorate of Urban Administration & Development, M.P., Bhopal, $686,972
- **Solar Photovoltaic (PV) Systems Training for Electrical Professionals** – Directorate of Urban Administration & Development, M.P., Bhopal, $599,796
- **Commercialization of Renewable Natural Gas in FL** – Associated Gas Distributors of Florida, $107,770
- **The Use of Solar Concentrated Power to Drive a Modified Kvaerner Process to Make Hydrogen and Carbon Black from Organic Matter** – University of Applied Sciences Technikum Wien, $248,943
- **Identifying Durability Bottlenecks in Carrier Selective Heterostructures to Inform the Evolving Si Technology Pathway** – Case Western Reserve University, $62,530
- **Dynamic Control of Autonomous Grid-Forming PV Inverters with Enhanced Resiliency and Stability** – Univ. of Houston, $807,987
- **Passivating, Carrier-Selective Contacts Using Doped Silicon Deposited by In-line APCVD** – U.S. Department of Energy/Schmid Thermal Systems Inc., $2M

DOE VTO 2020 FOA 2197

- Concept Papers submitted February 21, 2020
  - Encouraged/Discouraged ~March 17, 2020
  - Encouraged means go for full application
    - Full Application deadline April 28, 2020
    - Funding to begin (if awarded) September 2020
- Proposal Titles (Encouraged)
  - DRIVE EVs in the USA
    - PI Jonathan Overly, East Tennessee Clean Fuels Coalition (Colleen Kettles, FSEC PI) $3 M, 3 years
  - EV Ecosystem
    - PI Michael Gorin, National Fire Protection Association, request $**?** M, 3 years

DOE SETO 2020 FOA 2243

- Concept Papers submitted March 16, 2020
  - Encouraged/Discouraged ~April 20, 2020
  - Encouraged means go for full application
    - Full Application deadline May 21, 2020
    - Funding to begin (if awarded) 1/1/2021
- Proposal Titles
  - Measuring the inverter's actual field operational conditions and applying them in accelerated testing protocols for lifetime prediction
    - PI Joe Walters FSEC, request $2 M, 3 years
  - Developing PID susceptibility models for Bifacial PV module technologies
    - PI Joe Walters FSEC, request $2 M, 3 years
  - Integrated PV System Design and Management Platform for the Co-Optimization of Regenerative Cattle Grazing and PV Solar Generation
    - PI Michael Baute, Silicon Ranch, request $2 M, 3 years
  - Growing Agriculture and Solar in the Sunshine State
    - PI April Combs, Florida Department of Agriculture and Consumer Services, $ 2M, 3 years

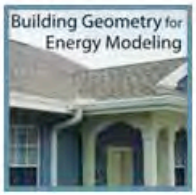
Upcoming DOE FOA on Connected Communities

- The Office of Energy Efficiency and Renewable Energy (EERE) has released an RFI to request feedback on the topic of "Connected" Communities.
- The goal of this planned FOA would be to demonstrate the ability of efficient buildings to interact with the grid to provide demand flexibility.
- This includes the ability to shift and modulate load in both existing and new communities across diverse climates, geography, building types and grid/regulatory structures, while maintaining (if not enhancing) occupant satisfaction and productivity.
- **FSEC is responding and identifying potential collaborators.**

New Online Training Track

Residential Energy Modeler Track (Online)

This educational track involves five courses and a test at the end. All of these courses can be taken online. Becoming a Certified Residential Energy Modeler is a great first step in your Energy Modeling career.



Building Geometry for Energy Modeling (Online)
A free, 1-hour online course. Learn about the building geometry measurements and calculations needed for residential modeling.

Building Science for Energy Modeling and Field Inspection (Online)

This course is coming soon.

Introduction to the Home Energy Rating System (HERS) (Online)

This course is coming soon.

From Blueprints to Residential Energy Code Compliance (Online).
This is an interactive course where you will learn to measure blueprints and complete take-off sheets for Residential Florida Energy Code compliance.

EnergyGauge Pro Hands-On (Online).
Learn all about EnergyGauge USA using a sample project house and the latest Florida Energy Conservation Code. Earn 3 CILB CEUs.

Residential Energy Modeler Test (Online)

After having completed the five courses in this track, take this test to earn your certification. This test is coming soon.

UCFTODAY

WEDNESDAY, MARCH 25, 2020 HIGH 88° LOW 68°

Photo Credit to University of Missouri

Board of Governors Confirms Alexander Cartwright as UCF's President

First Day of Work: April 13, 2020

Questions?

FSEC Energy Research Center

UNIVERSITY OF CENTRAL FLORIDA