

FESC Summit

September 29-30, 2009 • University of South Florida

All events will take place at the Marshall Student Center unless otherwise noted.

Summit Objective: To bring energy experts in the SUS together to share their energy-related research findings and promote future collaboration.

Pre-Summit Activities

MONDAY, SEPTEMBER 28:

9:30 AM – 1:30 PM Florida Smart Grid Workshop (<http://www.caps.fsu.edu/SmartGrid-Workshop.html>)
Embassy Suites Hotel USF

TUESDAY, SEPTEMBER 29:

8:00 – 11:00 AM Florida Energy and Climate Commission (FECC) meeting - Open to the public.
Marshall Student Center 3707 (the Oak Room), 8:00AM – 11:00AM
Agenda will be posted at the FECC website:

http://myfloridaclimate.com/climate_quick_links/florida_energy_climate_commission/the_commission/meetings_and_workshops

FESC SUMMIT

TUESDAY, SEPTEMBER 29

9:00 – 11:00 AM Registration and Poster set-up
Marshall Student Center (MSC) 2100AB

GENERAL SESSION: MARSHALL STUDENT CENTER BALLROOM (2100 AB)

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|-------------------------|---|
| 11:05 - 11:15 AM | WELCOME
<i>Karen Holbrook, Vice President for Research and Innovation, University of South Florida</i> |
| 11:15 – NOON | KEYNOTE ADDRESS
<i>Sam Baldwin, Chief Technology Officer and Member, Board of Directors, Office of the Secretary, U.S. DOE Energy Efficiency and Renewable Energy</i> |
| NOON – 1:00 PM | BUFFET LUNCH |
| 1:00 - 2:00 PM | OVERVIEW OF FLORIDA'S ENERGY NEEDS AND OPPORTUNITIES
<i>James F. Murley, Chairman, Florida Energy and Climate Commission</i>
<i>Mark Futrell, Office of Strategic Analysis and Governmental Affairs,</i>
<i>Florida Public Service Commission</i> |
| 2:00 – 2:30 PM | OVERVIEW OF FESC STRATEGIES AND PROGRAMS
<i>Tim Anderson, Director, FESC</i> |
| 2:30 – 3:15 PM | ROUND TABLE DISCUSSION
<i>Facilitator: Tim Anderson</i> <ul style="list-style-type: none">• How can Florida universities best promote research collaboration among themselves and with industry, and assist the state's economic development? |
| 3:15 – 3:45 PM | BREAK |
| 3:45 – 5:15 PM | POSTER OVERVIEWS
<i>Moderator: Dave Cartes (invited)</i>
order of presentations TBD |

- 3:50 Research Laboratories and Facilities Development
D. Block
- 3:52 Concentrating Solar Power Program
C. Cromer, R. Reedy
- 3:54 Promoting Energy Sustainability through Land Use, Transportation, and Green Infrastructure Policies
T. Chapin, I. Audirac
- 3:56 Siting Renewable Energy Infrastructure: Regulatory Barriers and Key Considerations
U. Outka
- 3:58 Design and Implementation of Low Cost Pyrheliometer
M. Gnos, B. Greksa, A. Krothapalli
- 4:00 Systems Approach to Bioenergy Research (SABER)
J. Kostka
- 4:02 ESC Advanced Solar Simulator
J. Pandolfini, B. Greska, A. Krothapalli
- 4:04 Flooding Detection in Microjet PEM Fuel
A. Badaru, B. Greska, A. Krothapalli
- 4:06 Dual Fluidized Bed Biomass Gasification for H₂ Production
J. Dascomb
- 4:08 Design of a Spiral Tube Bubble Column Photobioreactor
Q. Straub, T. Tracy, J.C. Ordonez
- 4:10 Multi-Objective Optimization of Power Plants to Reduce Operating Costs
G.S. Dulikravich
- 4:12 Impact on a Microgrid of Increased Market Penetration of Plug-In Hybrid Electric Vehicles
B. Hacker, S. Azongha, C. Edrington
- 4:14 Energy Delivery Infrastructure
A. Domijan, A. Islam
- 4:16 Effect of Cluster Size on CO Absorption and Dissociation on Cobalt Catalysts: DFT Studies using Cluster Models
N. Balakrishnan, V.R. Bethanabotla, B. Joseph
- 4:18 Device simulation of ZnO/CdS/CIGS/Mo solar cell using Medici
Y. Hu, G. Bosman, T. Anderson
- 4:20 Energy Efficient Technologies and the Zero Energy Home Learning Center
S. Russell, Y. Goswami, M. Rodriguez
- 4:22 Metal/Support Interaction Effects in Fischer-Tropsch Synthesis: Significance of Catalyst Preparation
S.A.Z. Gardezi, B. Joseph, J.T. Wolan
- 4:24 Preparing the Technical Workforce to Meet Florida's 21st Century Needs
M. Barger, R. Gilbert
- 4:26 Cobalt Nanoparticles on Surface Modified SiO₂ Colloids for Fischer-Tropsch Synthesis
B.D. Mankidy, V.K. Gupta
- 4:28 Effect of Transition Metal Oxide Interlayer on the Performance of Bulk Heterojunction Solar Cell
J. Subbiah, F. So
- 4:30 Combined Cooling, Heat, Power, and Biofuel from Biomass and Solid Waste
W.L. Lear, J.N. Chung
- 4:32 Development of High Throughput CIGS Manufacturing Process
N. Dhere
- 4:34 PV Power Generation Using Plug-In Hybrid Vehicles as Energy Storage
J. Shen, I. Batarseh, N. Kutkut
- 4:36 Wave Power Generation
Z. Qu, K. Lin
- 4:38 Development of Metal-Insulator-Metal Diode-Based Un-Cooled Terahertz Detector
I-T. Wu, K. Son, J. Wang
- 4:40 Clean Drinking Water using Advanced Solar Energy Technologies
J. Klausner, F. Alnaimant
- 4:42 Solar-Thermal Chemistry for Hydrogen Generation
R. Stehle, M. Bobek, D.W. hahn

- 4:44 Water-use Efficiency and Feedstock Composition of Candidate Bioenergy Grasses in Florida
L. Sollenberger, J.E. Erickson, J.M.B. Vendramini, R.A. Gilbert, L.O. Ingram, J.R. Fedenko, Z.R. Helsen, K. Woodward
- 4:46 High Rate Chemical Vapor Deposition of Cu(In,Ga)Se₂
C.P. Muzzillo; T.J. Anderson
- 4:48 Nanostructured Chevrel Phase for Magnesium Battery Cathodes
R.Scheffler, W. Sigmund
- 4:50 Aluminum Secondary Battery – Battery of the Future
A. Biswas, W.M. Sigmund
- 4:52 Green Networks: New Results and Next Steps to Benefit Florida
K. Christensen
- 4:54 Database Infrastructure for Integrative Carbon Science Research
S. Grunwald, T. Martin, G.M. Basques, B. Hoover, C.A. Gonzales, R. Bracho-Garriloo, H. Beck
- 4:56 Fabrication of CIS Solar Cells using Nanoparticle-based Processing Technique
R. Krishnan, U.Farva, J. Young, A. Payzant, T. Anderson, C. Park
- 4:58 Solid State Phase Transformation of Cadmium Selenide Nanoparticles upon Thermal Annealing
R. Krishnan, U. Farva, N.T.N. Troung, T.J. Anderson, C.H. Park
- 5:00 Indium Gallium Nitride Solar Cell Device Simulations
D. Wood, J. Mangum, T. Anderson, G. Bosman
- 5:02 An Experimental Investigation of Economic Incentives in Environmental Conservation, Sustainability, and Renewable Energy
S. Pevnitskaya, D. Ryvkin
- 5:04 Public and Private Solutions to the Hold-Out Problem in Infrastructure Land Acquisition
S.M. Collins, R.M. Isaac
- 5:06 Communicating Energy Efficiency through Public Service Announcements
A. Opel, L. Arpan, P. Steinberg

5:30 – 7:00 PM **POSTER SESSION AND RECEPTION**

7:00 PM Dinner on your own

WEDNESDAY, SEPTEMBER 30:

GENERAL SESSION: MARSHALL STUDENT CENTER BALLROOM (2100 BC)

8:30 – 9:00 AM **PRESENTATION OF RESULTS FROM ROUND TABLE DISCUSSION**

FESC FACULTY RESEARCH PRESENTATIONS

9:00 – 10:30 AM **ORAL PRESENTATIONS: SESSION I**

MSC 3705: Energy Efficiency & Conservation, Education & Outreach, Policy

Co-Chairs: Julie Harrington, Richard Gilbert (invited)

FESC Education and Outreach Efforts

P. Jones

Early Adoption of Sustainable Energy Innovations by Florida Local Governments

R. Feiock and T. Kassekert

Off-Grid Zero Emissions Building

J. Kramer, A. Krothapalli, B. Greska

Developing a Renewable Energy Research Web Portal

C. Hinnant, I. Douglas, C. McClure

MSC 3708: Biomass Resources, Carbon Capture

Co-Chairs: Joel Kostka (Invited), TBD

Thermophilic Bacterial Biocatalysts for the Conversion of Cellulosic Substrates to Fuels and Chemicals

K.T. Shanmugam

Production of Liquid Fuels Biomass via Thermo-Chemical Processes

B. Joseph, Y. Goswami, J. Bhethanabotla, J. Wolan, V. Gupta

Accounting for Carbon Emissions in Florida: Land Use, Energy, and Fuel

T. Zhao and M. Horner

Engineering biocatalysts for Hemicellulose Hydrolysis and Fermentation

J. F. Preston

MSC 3708: Ocean Energy Resources, Solar Resources

Co-Chairs: Camille Coley, David Block

FAU Center for Ocean Energy Technology

S. Skemp, H. Hanson, C. Coley

Beyond Photovoltaics – Nanoscale Rectennas for Conversion of Solar and Thermal Radiation to Electricity

S. Bhansali, Y. Goswami, E. Stefanakos, S. Krishman, R. Ratnadurai, M. Celestin, S. Wijewardane

Solar Thermal Power for Bulk Power and Distributed Generation

D.Y. Goswami, M. Rahman, A. Sunol, R. Vasquez, H. Chen, G. Demirkaya

Thin Film Photovoltaic Module Processing Laboratory

D. Morel, C. Ferekides, E. Stefanakos

MSC 3711: Energy Storage and Delivery, Smart Grid

Co-Chairs: Dave Cartes, Debra Reinhardt (invited)

Non-contact Energy Delivery with Integrated DC-AC Inverter for PV System

R.A. Chinga, J.J. Kasanova, J.A. Taylor, J. Lin

Chemical and Mechanical Degradation of Fuel Cells

D. Slattery, L. Bonville, X. Huang, M. Rodgers

Reliable and Resilient Future Electrical Energy System for Florida

S. Dale, M. Seurer, T. Baldwin, P. McLaren, T. Alquthami, J. Langston, R. Meeker

Innovative Processing for Novel Energy Storage Materials

Wolfgang Sigmund

GENERAL SESSION: MARSHALL STUDENT CENTER BALLROOM (2100 BC)

10:40 AM –12:40 PM TECHNICAL TEAM ROUNDTABLE DISCUSSIONS AND BUFFET WORKING LUNCH

Moderator: Canan Balaban

Technical Teams

Energy Efficiency and Conservation

Team Leader: Pierce Jones; Scribe: Gokmen Demirkaya

Carbon Capture and Sequestration

Team Leader: Mark Stewart; Scribe: Huijian Chen

Ocean Energy

Team Leader: Howard Hanson; Scribe: Barbara Graham

Energy Storage

Battery and Super Capacitors – Team Leader: Jim Zheng; Scribe: I-Tsang Wu

Fuel Cells – Team Leader: Jim Fenton (invited); Scribe: Ruraskandan Ratnadurai

Smart Grid

Team Leader: Dave Cartes; Scribe: Ali E. Ercelibi

Solar PV

Team Leader: Tim Anderson; Scribe: Kosol Son

Solar Thermal

Team Leader: Yogi Goswami; Scribe: Sarada Kuravi

Algae

Team Leader: George Philippidis; Scribe: Nianthrini Balakrishnan

Biomass

Team Leader: Babu Joseph; Scribe: Ricardo Vasquez Padilla

Policy and Systems

Team Leader: Mark Jamison; Scribe: Bijith Mankidy

Scribes to be assigned: Raymond Scheffle, Apratim Biswas

11:30 AM – 12:30 PM OVERSIGHT BOARD LUNCH HOSTED BY WIN PHILLIPS (INVITATION ONLY)

FESC FACULTY RESEARCH PRESENTATIONS

12:50 – 2:10 PM ORAL PRESENTATIONS: SESSION II

MSC 3705: Energy Efficiency & Conservation, Education & Outreach, Policy

Co-Chairs: Pierce Jones, Ted Kury

Energy Policy and the Environment: Challenges and Opportunities

T. Kury, J. Harrington

Multi-Objective Optimization of Power Plants to Reduce Operating Costs and Maintenance Costs

G.S. Dulikravich

Optimizing Traffic Signal Timings to Reduce Fuel Consumption, Green House Gases, and Vehicular Emissions

A. Stevanovic

Energy Efficient Building Technologies and Zero Energy Homes

R. Vieira, P. Fairey, J. Sonne

MSC 3708: Biomass Resources, Carbon Capture

Co-Chairs: George Philippidis, James Preston

Integrated Florida Bio-Energy Production with Carbon Capture and Sequestration

A. T-Raissi, N. Muradov, D. Block

Combined Cooling, Heat, Power, and Biofuel from Biomass and Solid Waste

W.L. Lear, J.N. Chung

A Model for Redistribution of Cap-and-Trade Revenue

P. Rocha, E. Salimi, T.K. Das, R. Fehr

Potential for Geologic Carbon Sequestration in Deep Saline Aquifers in Florida

T. Roberts-Ashby, R. Owen, M. Thomas, M. Trotz, J. Cunningham, M. Stewart

MSC 3709: Ocean Energy Resources, Solar Resources

Co-Chairs: Franky So, Darlene Slattery

Research to Improve Photovoltaic (PV) Cell Efficiency by Hybrid Combination of PV and Thermoelectric Cell Elements

N. Sorlaica-Hickman, R. Reedy

PV Energy Conversion and System Integration

N. Kutkut, J. Shen, I. Batarseh, Z. Qu, X. Wu, W. Mikhael, L. Chow

VIVACE: A New Concept in Hydrokinetic Energy Conversion

M.M. Bernitsas

Clean Drinking Water using Advanced Solar Energy Technologies

E. Stefanakos, D.Y. Goswami, M. Trotz, M. Batzill

MSC 3711: Future Directions

Co-Chairs: Ali T-Raissi, Co-Chair TBD

PV Manufacturing Database and Florida Applications

D. Block, R. Reedy

Solar Thermal Power

Y. Goswami

Biomass (TBD)

B. Joseph, G. Philippidis (invited)

Smart Grid (TBD)

Dave Cartes

GENERAL SESSION: MARSHALL STUDENT CENTER BALLROOM (2100 BC)

2:10 – 2:40 PM Break

2:40 – 4:10 PM OVERVIEW PRESENTATIONS

Camille Coley, Executive Assistant Vice President, FAU

Mark Jamison, Director, Public Utility Research Center, UF

Jim Fenton, Director, Florida Solar Energy Center, UCF

4:10 CLOSING REMARKS - TBD