

2014 FESC Workshop
AGENDA (DRAFT)
May 12-13, 2014 Gainesville, FL

MONDAY, MAY 12

7:00 - 8:00 am REGISTRATION, HILTON, Gainesville FL
POSTER SET-UP for Session I
BREAKFAST

GENERAL SESSION: HILTON – ROOM A

MODERATOR: JENNIFER CURTIS

8:00 - 8:10 am WELCOME

David Norton, Chair, FESC Oversight Board, VP Research, University of Florida

8:10 - 8:20 am WELCOME

Adam H. Putnam, *(Invited)*

Commissioner, Florida Department of Agriculture and Consumer Services

8:20 – 9:20 am SESSION I: BIOMASS AND SMART GRID PANEL SESSION

Biomass: Paul Bryan, Professor at UC Berkeley and former Program Manager for US-DOE Efficiency and Renewable Energy's Biomass Program

Smart Grid: Electric Energy Systems of the Future - Visions, Challenges, and Opportunities - Pramod P. Khargonekar, Head of Engineering Directorate, National Science Foundation

9:20 – 9:35 am BREAK

9:35 – 10:45 am SESSION I SHORT ORAL PRESENTATIONS (5 min each)

Track I : Biomass HILTON – ROOM B

Chair: TBD

- *Potential for Oilseed Crops in the Southeast-David Wright, James Marois, Sheeja George, University of Florida - IFAS*
- *Pongamia - An Oilseed Tree Crop for Florida's Lost Citrus Acreage-Claire Kinlaw, TomSchenk, Naveen Sikka, Terviva Inc.,*
- *Evaluating eTuber and Energy beets as Feedstocks for Biofuels and Biogas in South Florida-Brian Boman, Edward Evans Ann Wilkie, University of Florida- IFAS*

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- *Commercial Production of Terpene Biofuels from Existing Slash Pine Plantations-Gary Peter, Jennifer Lauture, Alan Hodges, University of Florida- IFAS*
- *Environmentally and economically sustainable production of fuels and chemicals from sweet sorghum- Wilfred Vermerris, John Erickson, Lonnie Ingram, University of Florida- IFAS*
- *Engineering Bacillus subtilis biocatalysts for production of biofuels and chemical feedstocks and biochemicals for pharmaceutical and nutraceutical applications- James Preston, Mun Su Rhee, Lusha Wei, University of Florida- IFAS*
- *Biomass Treatment with Supercritical Fluids for high throughput and yield to fuels- Aydin Sunol, Kyle Cogswell, Aaron Driscoll, and Zachary Cerniga University of South Florida*
- *Oxygen-blown Gasification for Efficient Conversion of Woody Biomass to Liquid Hydrocarbon Fuels- Ali T-Raissi, Florida Solar Energy Center*
- *Dual pretreatment Strategy for Enhanced Biomass Hydrolysis- John Telotte, Subramanian Ramakrishnan, Florida State University*
- *Harvest Power-Christopher Balfe, Molly Bales, Harvest Power Inc.*
- *Floating cultivation system for low-cost production of algae- Dr. Ioannis Doqaris,
Dr. George Philippidis, University of South Florida*
- *Dealing with Heterogeneity: The Central Problem with Using Agroindustrial Waste as a Feedstock for Heterotrophic Algae-Thomas Lyons, Eudes de Crecy, BioTork*
- *Landfill Gas to Liquid Fuel-Ryan Kent, Ali Gardezi, Dr. Babu Joseph, Dr. John Kuhn, University of South Florida*
- *An experimental evaluation and thermochemical modeling of high temperature steam gasification of municipal solid waste (MSW)-Uisung Lee, J.N. Chung, H.A. Ingley, University of Florida*

Track II: Smart Grid HILTON – ROOM C

Chair: TBD

- *Power Quality Impact Study For Interconnection of Heterogeneous Distributed Energy Resources-Ali Hariri, Omar Faruque, FSU Center For Advanced Power Systems*
- *Joint Operational Model for Smart grid with Community Microgrids under Carbon Emissions Control-Felipe Feijoo, Tapas K. Das, University of South Florida*
- *Wireless, Energy Harvesting Technology and the Internet of Things-Cory Vanderpool*
- *Recent Fuel Cell Research Activities at FSEC-Ali T-Raissi, Florida Solar Energy Center*
- *Ultra-Compact Portable Power: Direct Methanol Fuel Cell Open-Cathode System-Fenner Colson, Matt Inman, University of Florida*

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- *Microstructure effects on the capacity, power, and energy density of metal-air batteries for large grid storage applications- Petru Andrei, Vamsci Bevara, Florida State University*
- *Nanomaterials for enhancing electrochemical energy storage-Wolfgang Sigmund, Rui Qing, University of Florida*
- *The Effects of the Discharge Product on the Discharge Characteristics of Li-air Batteries-Vamsci V. Bevara, Petru Andrei, Florida State University*
- *Non-Destructive Testing and Quality Control Technologies. Ensuring High Quality, Safety and Reliability of New Generation Batteries-Volodymyr Redko, Elena Shembel, Enerize Corp.*
- *Power Quality Improvement of Electric Vehicle DC Charging Stations Utilizing UPQC and SFCL- M.H. Amini, Arif Sarwat, A.H. Moghadasi, M. Jamei, Florida International University*
- *Buildings as batteries: inexpensive ancillary service to the grid from HVAC systems- Yashen Lin, Prabir Barooah, Sean Meyn, University of Florida*
- *Hydrogen Energy Storage for On-Board Fuel Cells, Concentrated Solar Power and Secondary Batteries- Sesha Srinivasan, Tuskegee University, D. Yogi Goswami, Elias K. Stefanakos, Dervis Emre Demirocak, University of South Florida, Sarada Kuravi, Florida Institute of Technology, Ryan Integlia, Jorge Vargas, Florida Polytech University*
- *Development and characterization of novel metal chloride thermal storage media with enhanced heat transfer- Philip D. Myers, D. Yogi Goswami, Elias Stefanakos, University of South Florida*
- *Encapsulation of the Phase Change Materials and Its Application in Thermal Energy Storage System- Tanvir E Alam, Jaspreet Dhau, D. Y. Goswami , E. Stefanakos, University of South Florida*

10:45 – 11:45 am SESSION I POSTER REVIEW AND DISCUSSIONS

11:45 - 12:45 BUFFET LUNCH

REMOVAL OF SESSION I POSTERS and SET-UP of SESSION II POSTERS

12:45 - 1:45 pm SESSION II: SOLAR ENERGY AND ENERGY EFFICIENCY PANEL SESSION

Solar Energy: Solar Energy: What's Next? - Dr. Ryne Raffaele, Vice President for Research and Associate Provost, Rochester Institute of Technology

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Energy Efficiency: DOE Building Technologies Office: Energy Efficiency R&D - Patrick Phelan, Supervisor, Building Technologies Program, US-DOE, Energy Efficiency and Renewable Energy

1:45 - 2:00 BREAK

2:00 - 3:10 pm SESSION II ORAL PRESENTATIONS (5 min each)

Track I : Solar Energy HILTON – ROOM B

Chair: TBD

- *Advances in Micro-inverter Technologies-Issa Batarseh, Ahmadreza Amirahmadi, Lin Chen, University of Central Florida*
- *Photomechanics of Liquid Crystal Polymer Networks-William Oates, Florida State University*
- *Distributed & Mobile Solar Electricity Generation with Energy Storage Devices and Application to PrePaid (PPD) Technology for the Latin America marketplace-Albert Rodriquez, ATI Energia LLC ATI Companies Group*
- *Nanostructured Transparent Polymer for Encapsulation of PV Modules and Optical Devices. Breakthrough in Design and Properties of Solar Cells-Elena Shembel, Enerize Corporation*
- *Laser Processing for the Formation of Ohmic Contacts to CdTe Solar Cells-Vasilios Palekis, Prasad Banel, Christos Ferekides, University of South Florida*
- *Effective Doping of CdTe towards High Efficiency Thin Film Solar Cell- M. I. Khan, S. Collins and C. Ferekides, University of South Florida*
- *Cooling Channel Analysis to Enhance the Efficiency of Photovoltaic Panels- Obiechina Abakporo, Dr. Juan Ordonez, Dr. Alejandro Rivera, Florida A&M University*
- *Integration of Transparent Insulation Materials into Solar Collection Devices-Sam Yang, Alejandro Rivera, Juan Ordonez, FSU Center for Advanced Power Systems*
- *Air-Processed Polymer-Fullerene Bulk Heterojunction Solar Cells With Higher Than 6% Efficiency- Iordania Constantinou, John R. Reynolds, Franky So, University of Florida*
- *Development of Novel Water Splitting Materials for the Production of Renewable Hydrogen-Samantha Roberts, Helena E. Hagelin-Weaver, University of Florida*
- *Kinetic and Material Analysis for Solar Fuel Production-Michael Bobek, Nathan Rhodes, David Hahn, University of Florida*
- *Energy Glass - The Next Generation in Solar Energy Production with Enhanced Building Physical Security-Theron Colbert, TiRC Energy Engineering, International Professional LLC*

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- A Mathematical Model for Performance Prediction of a Hybrid PV/T Module for Hot and Humid Climates - Cheng-Xian Lin, Francisco Emilio Zevallos , Florida International University
- *Solar Water Heating as a Green House Gas Reduction and Energy Conservation Strategy-* Thomas Lane, Colleen Kettles, ECS Solar and Florida Solar Energy Center/UCF

Track II : Energy Efficiency HILTON – ROOM C

Chair: TBD

- *Thermal Simulation of FSU's Off-Grid Zero Emissions Building-*Juan Ordonez, Florida State University
- *Low cost building energy efficiency solution based on real-time occupancy based control-* Prabir Barooah, University of Florida
- *Moisture and Energy Consequences of a Tight Residential Envelope-* Robin Vieira, Danny Parker, Philip Fairey III, John Sherwin, Chuck Withers, David Hoak, Florida Solar Energy Center/UCF
- *An overview of Building America Partnership for Improved Residential Construction (BA-PIRC) Activities in Hot Humid Climates-*Eric Martin, Florida Solar Energy Center/UCF
- *Targeting utility customers to improve energy savings from conservation and efficiency Programs -* Nicholas W. Taylor, Pierce H. Jones, M. Jennison Kipp, University of Florida
- *Exploring the Market for Multifamily Energy-Efficiency Retrofits in Florida-* M. Jennison Searcy, Pierce H. Jones, Nicholas W. Taylor, University of Florida
- *Side by Side Evaluation of Residential Hot Water Heating Systems in Florida-*Carlos Colon, Florida Solar Energy Center/UCF
- *My Florida Home Energy Interactive Web tool-* Lesly A. Jerome, Harold S. Knowles, III, Nicholas W. Taylor, University of Florida
- *A Program for Energy Efficient and Environmentally Sustainable Laboratories -* Philip J. Wirdzek, International Institute for Sustainable Laboratories (I2SL)
- *Permanent Magnet for Energy Efficiency Systems-* Ke Han, FSU Mag Lab
- *Energy Efficiency and NRCE: A Needed, Country, State and Industrial Policy/Program-* Cristian Cardenas-Lailhacar, Universidad de Investigación de Tecnología Experimental YACHAY, Urcuquí, Ecuador
- *Florida Energy Efficiency Loan (FEEL): A New Residential Lifestyle Literacy and Leveraged Lending Program-*Craig Miller, Hal Knowles, University of Florida - Program for Resource Efficient Communities
- *Energy Efficient Transportation-*John Nuskowski, University of North Florida
- *Energy-Aware Database Disk Storage System-* Yicheng Tu, Bo Zeng, Peyman Behzadnia, Wei Yuan, University of South Florida

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3:10 – 4:10 pm SESSION II POSTER REVIEW AND DISCUSSIONS

4:10 – 4:15 pm REMOVAL of SESSION II POSTERS and SET-UP of ADDITIONAL POSTERS

4:15 – 5:15 pm ROUNDTABLE DISCUSSION – Rooms A, B, C, Dogwood and Hickory

- 1- Energy Efficiency – Hickory Room
- 2- Biomass – Room A
 - Algae
 - Energy Crops
 - Biochemical Conversion
 - Thermo-chemical Conversion
 - Waste to Energy
- 3- Solar – Room B
 - Solar PV
 - Solar Thermal
- 4- Smart Grid and Storage – Room C
 - Grid
 - Energy Storage
- 5- Natural Gas – Room B
- 6- Education – Dogwood Room

5:15 - 6:15 pm ADDITIONAL POSTER SESSION

The list of posters is given at the end of the agenda.

6:15 - 7:15 pm RECEPTION – Room A

7:15 pm REMOVAL OF ADDITIONAL POSTERS – SET-UP of SESSION III POSTERS

7:15 pm DINNER ON YOUR OWN

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TUESDAY, MAY 13

7:00 – 8:00 BREAKFAST

GENERAL SESSION: Hilton – Room A

8:00 – 9:00 am ROUNDTABLE REPORTS (5 min)

**9:00 – 10:30 am SESSION III: NATURAL GAS, MARINE ENERGY, AND EDUCATION
PANEL SESSION**

Natural Gas: Natural Gas: Serving Florida's Energy Needs Today and in the Future - John R. Mclelland, Director Gas Supply and Wholesale Origination, TECO Peoples Gas

Marine Energy: Camille Coley, Assistant Vice President for Research, Associate Director for the Southeast National Marine Renewable Energy Center, Florida Atlantic University

Education: Trends in Energy Education and Workforce Development - Dr. Dean Evasius, Vice President and Director of Science Education Programs, Oak Ridge Associated Universities

10:30 – 10:45 am BREAK

10:45– 11:25 am SESSION III ORAL PRESENTATIONS (5 min each)

Track I: Natural Gas and Marine Energy HILTON – ROOM B

Chair: TBD

- *The Direct Use of Natural Gas - Scott Ranck, Florida Public Utilities Company*
- *Natural Gas As A Transportation Fuel - Mark Thompson, Florida Public Utilities Company*
- *So Natural Gas Motor Fuels are Cheaper than Oil: Does This Solve Our Energy Problem? - David E. Bruderly, Bruderly Engineering Associates, Inc.*
- *Crew Member Training Standards for Natural Gas-Fueled Ships - Dennis L. Bryant, Bryant's Maritime Consulting*

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- *Evaluation of Viability of Combined Heat and Power Projects in Florida - Mark Cutshaw, Florida Public Utilities Company*
- *Performance Evaluation and Field Testing of Gas Heat Pump - Rajeev Kamal, D. Yogi Goswami, University of South Florida*
- *Scaling relations for the model scale testing of hydrokinetic ocean renewable energy systems- Karl Von Ellenrieder, Valentine W., Florida Atlantic University*
- *Water Energy for Florida and the USA-George Meyer, Engineer & Energy Invest. Consultants*

Track II: Education HILTON – ROOM C

Chair: JENNIFER CURTIS

- *Renewable Energy Education Program at USF's Patel College of Global Sustainability- George Philippidis, University of South Florida*
- *A new course on the relation between energy use and building design & operation- Prabir Barooah, University of Florida*
- *Educating on Economic Realities of Sustainable Energy- Mark Jamison, University of Florida*
- *Introducing Specialization in “Sustainable Energy Systems” for Under-Graduate Students in Engineering at the University of West Florida.- Bhuvanewari Ramachandran, University of West Florida*
- *Industrial Energy Efficiency Education-Nina Stokes, M Barger, Dr. Richard Gilbert, FLATE at Hillsborough CC*
- *Sustainable Floridians Program - Strengthening Your Sense of Place-Kathleen C. Ruppert, University of Florida*
- *Two Alternative Fusion Energy Confinement Concepts: Spheromaks and Laser-Assisted Muon Catalyzed Fusion-Charles A. Weatherford, Florida A&M University*
- *Challenges in Quantifying Optimal CO₂ Emissions Policy-Theodore J. Kury, University of Florida- Public Utility Research Center*

11:25 – 12:25 SESSION III POSTER REVIEW AND DISCUSSIONS



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GENERAL SESSION: HILTON – ROOM A

12:25 – 12:35 pm Patrick Sheehan, Director, Florida Office of Energy

12:35 – 12:45 pm Jennifer Curtis, Interim Director, FESC

12:45 REMOVAL OF POSTERS

12:45 BUFFET LUNCH

ADJOURN

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ADDITIONAL POSTER SESSION - List of Posters

BIOMASS

1. Biodiesel Production from Waste Oils using Non Catalytic Supercritical Alcohols -*Zachary Cerniga, Dr. Aydin Sunol, Dr. George Philippidis*, University of South Florida
2. Supercritical Gasification of Wet Biomass - *Aydin K. Sunol*, University of South Florida
3. Intragenic Precision Breeding Supports Targeted Modification of Lignin Biosynthesis in Sugarcane - *Jung JH, Dermawan H, Altpeter F*, University of Florida -IFAS
4. Breeding Elephantgrass for Elevated Biomass Yield and Biosafety - *Baskaran Kannan, Marco Sinche, Carlos Corsato, Fredy Altpeter*, University of Florida-IFAS
5. Emulsion of Lignin-co-butyl Acrylate as a Biobased Polymer System - *Suguna Jairam, Zhaohui Tong, Fei Wang*, University of Florida - IFAS
6. Development and Management of *Brassica carinata* (Ethiopian Mustard) as a "Drop-in" Biofuel - *Ramdeo Seepaul, Sheeja George, Ed Coppola, David L. Wright, Jim J. Marois*, University of Florida - IFAS
7. Sunflower Genotype Evaluation for Bio-oil Production in Florida -*Fedenko, JR, Wilke, AC, Erickson, JE*, University of Florida - IFAS
8. Bioenergy Plant: Efficient Method For Disposing Biodegradable Materials - *Jose Sifontes, Sigarca*
9. Anaerobic Digestion of Food Waste from Alachua County Schools - *Ryan E. Graunke, Ann C. Wilkie*, University of Florida-IFAS
10. Renewable Energy Production through Organic Waste Recycling at Christianville, Haiti - *Reginald Toussaint, Ann C. Wilkie*, University of Florida-IFAS
11. Methane Productivity of Organic Waste Treatment by Two-Phase Anaerobic Digestion - *Victoria Cortés, Ann C. Wilkie, Zamorano Agricultural University and university of Florida-IFAS*
12. Co-production of Astaxanthin and Biofuels - *Alec. S. Shoelson, Ann C. Wilkie*, University of Florida-IFAS
13. Characterization of Cellulosic Ethanol Stillage and Use as an Algal Growth Medium - *Tommie B. Lovato, Ann C. Wilkie*, University of Florida-IFAS
14. Reuse of Cellulosic Bioethanol Residuals - *Jianru Shi, George O'Connor, Ann C. Wilkie*, University of Florida-IFAS
15. Evaluation of Energy Recovery Potential From Sweet Potato Stillage - *Wendy Mussoline, Ann C. Wilkie*, University of Florida-IFAS
16. Anaerobic Co-Digestion of Swine Manure and Microalgae for Biogas Production - *Meng Wang, Eunyong Lee, Qiong Zhang and Sarina Ergas*, University of South Florida
17. Bioprospecting for Oleaginous Microalgae and/or Cyanobacteria From Wastewater Holding Tanks - *Devin Alvarez, Lowell Collins, Ashvini Chauhan*, Florida A&M University

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18. Wastewater Nutrient Sequestration and Production of Lipid-biofuels from a Newly Isolated Cyanothecce sp. strain SGAC1 - *Lowell Collins, Devin Alvarez, Ashvini Chauhan*, Florida A&M University
19. A Kinetic Model for Microalgae Growth in Wastewater - *Eunyoung Lee & Qiong Zhang*, University of South Florida
20. Indigenous Algal Growth on Municipal Sludge Centrate and a Simple Irradiance-based Model for Predicting Biomass Production in the System - *Trina Halfhide, Kofi Dalrymple, Ann Wilkie, Sarina Ergas*, University of South Florida
21. Alternative Sources of Nutrients for Production of Microalgae Biomass - *Kassiana Ribeiro dos Santos, Juan C. Ordonez*, Florida State University
22. Searching for the Lipid Trigger in Biofuel Green Algae - *Elton Goncalves, Jin Kho, Bala Rathinasabapathi*, University of Florida

SMART-GRID & STORAGE

23. Renewable Energy Investment and Operational Decision Model - *Alireza Ghalebani, Tapas K Das*, University of South Florida
24. Using Electrochemical Impedance Spectroscopy to Study the Reaction Rates and Diffusion Coefficients in Li Batteries - *Mohit Mehta, Petru Andrei*, Florida State University
25. Experimental Study of Heat Transfer Improvement in Phase Change Materials for Thermal Energy Storage - *Abhinav Bhardwaj, Elias Stefanakos, D.Y. Goswami*, Clean Energy Research Center, University of South Florida
26. Studying Stress Relaxation at Polymer Interfaces Using FTIR-ATR Spectroscopy - *Onyekachi Oparaji, Daniel Hallinan*, Florida State University
27. Designing Composite Polymer Electrolyte Interfaces for Stable Electrodes - *Guang Yang, Daniel Hallinan*, Florida State University

SOLAR

24. Investigation of TiO₂ Annealing and TiCl₄ Treatment on the Performance of Dye-Sensitized Solar Cells - *Shamara Collins, Arash Takshi, Chris Ferekides*, University of South Florida
25. A New Solar Radiation Interpolation Technique- *Cristian Cardenas-Lailhacar*, Universidad de Investigación de Tecnología Experimental YACHAY, Urcuquí, Ecuador
26. Cost Effectiveness of Energy Generating Solar Plant Using Sea Water - *Sarah Rajkumari Jayasekaran, Essy Tari, Hamid Shoraka, Fazil T Najafi*, University of Florida

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ENERGY EFFICIENCY

27. Home Health & Energy Metabolism: Diagnosing Disease in Our Dwellings - *Hal Knowles, Mark Hostetler, Pierce Jones, and others*, University of Florida - Program for Resource Efficient Communities
28. Analysis and Optimization of Combined Flash Binary Cycle for Geothermal Power Generation - *Mehdi Zeyghami, Yagi D Goswami*, University of South Florida
29. Cryogenic Thermal Modeling of Helium Gas-Cooled Superconducting Cable System Components - *Nick Suttell*, Center for Advanced Power Systems
30. Flat Plate Fins Shape Optimization - *Julian Osorio*, Florida State University
31. Modeling and Simulation of a Vapor Compression Refrigeration System - *T. K. Nunes, J. C. Ordonez, and J. V. C. Vargas*, Florida State University - Center for Advance Power Systems

EDUCATION

32. The Development of an Interactive Software as a Secondary Learning Tool for Undergraduate Fuel Cell Courses - *Amjad Aman, Yunjun Xu, Nina Orlovskaya, Haiyan Bai*, University of Central Florida

POLICY

33. Key Factors Influencing Energy Intensity in Developed and Emerging Countries - *Priscila Delfino*, University of Florida -Public Utility Research Center

WIND

34. A New Wind Power Forecasting Technique - *Cristián Cárdenas-Lailhacar*, Universidad de Investigación de Tecnología Experimental YACHAY, Urcuquí, Ecuador

OTHER

35. Comparison of Emerging Ground Propulsion Systems for Electrified Aircraft Taxi Operations - *Rui Guo, Yu Zhang, Qing Wang*, University of South Florida