The Florida Energy Systems Consortium (FESC) was created by Florida Statute to unite Florida's universities to position the State of Florida as a leader in energy research, education, innovative technologies, and energy systems analysis. The consortium accomplishes this goal through sharing energy-related expertise and promoting collaboration among energy experts at its 12 public universities and with Florida industry.

The Consortium supports the Florida Department of Agriculture and Consumer Services’ Office of Energy (FDACS OOE) in advancing alternative energy strategies, improving energy efficiencies and expanding economic development for the State of Florida.

**EDUCATION**

**Workforce Development**

- Energy education at community colleges leading to A.S. Degree and College Credit Certificates (CCC) in collaboration with Florida Advanced Technological Education Center (FLATE):
  - Engineering Technology A.S. Degree with specializations in Alternative Energy Technology and Industrial Energy Efficiency
  - CCC in Alternative Energy Systems Specialist and Industrial Energy Efficiency Specialist
  - College educator energy-related professional development and resources
  - Research on sustainability staffing and practices at state and community colleges
- Nuclear energy education via the nuclear training reactor at the University of Florida
- Undergraduate and Masters level energy course offerings and on-line certificate programs at FESC universities

**OUTREACH**

- Leveraging the existing network of extension offices within Florida to deliver educational programs and fact sheets related to energy and resource-efficient community development
- Annual workshops, FESC e-newsletters, and web-site: www.FloridaEnergy.ufl.edu

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**FESC LEADERSHIP**

**Dr. David Norton**
Interim Director

**Ms. Canan Balaban**
Associate Director
Email: cbalaban@ufl.edu

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**Advisory Board**

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**Oversight Board**

- Vice Presidents of Research from each FESC University

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**FESC Steering Committee**

- One faculty member from each FESC University

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**FESC Office**

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www.FloridaEnergy.ufl.edu
(352) 294-2027
Leadership In Energy Research Enabled by a Systems Approach

“Florida Universities innovating for a sustainable energy future”

FOCUS AREAS TOWARDS FLORIDA’S ENERGY LEADERSHIP

The Florida Energy Systems Consortium’s (FESC) research program has five focus areas. In each of these areas, Florida’s state universities partner with industry to provide technical expertise to meet pressing industry needs and to bring emerging energy technologies to market.

The novel technologies developed by FESC harness Florida’s natural resources and reduce energy dependency on outside sources. In addition, these focus areas are represented in the Consortium’s workforce development programs, which serve Florida’s industries and utilities, and in the Consortium’s outreach programs which serve the public by reducing their energy bills through conservation.

CONVERTING FLORIDA’S BIOMASS TO RENEWABLE FUELS

Florida ranks first in the country in annual generation of cellulosic biomass with almost 10% of the US total. In Florida, several biomass species are produced in large volumes, primarily sugar cane bagasse in South Florida, citrus peel in Central Florida, and woody biomass in North Florida. Florida’s location and resources position it to be a leader in the development and commercialization of biomass-to-fuel technologies in partnership with the private sector. Such leadership brings investment, jobs, and tax revenue to the State and diversifies Florida’s economy, while making it more sustainable. The key research focus areas include:

- Feedstock Development and Deployment
- Cellulosic Biomass Technologies
- Algae Technologies
- Anaerobic Digestion Technologies

SUPPORTING UTILITIES IN SMART GRID AND ENERGY STORAGE

FESC supports Investor Owned Utilities (IOU), Cooperative Electric Utilities, and Municipal Utilities to develop smart grids with intermittent power sources such as PV and wind, distributed electric generation, state-of-the-art power electronics, and grid level energy storage. The areas of collaborative research include:

- Florida’s generation capacity growth, transmission grid expansion, efficiency, and grid modernization
- Florida’s distribution grids, distributed generation resources, demand side management, and on-premise appliance integration in efficiency programs
- Integration of renewables to the grid
- Resilient grids via advanced cyber-physical systems
- Floridian economics and consumer behavior

OVERARCHING UNDERSTANDING OF FLORIDA’S ENERGY SYSTEMS

Overarching to the Consortium’s research strategy is an energy systems approach to develop integrated systems with robust designs and holistic practice. The goals are:

- Identify and evaluate research opportunities
- Perform selected and recurring analyses
- Provide objective and quantitative assessments to the state
- Evaluate alternative power delivery and transportation systems

ENHANCING ENERGY EFFICIENCY AND CONSERVATION

Energy efficiency and conservation offer the greatest potential to reduce Florida’s energy consumption. Buildings use more energy than any other sector of the economy, including transportation and industry. Because of Florida’s hot and humid climate, much of the building sciences research conducted nationally doesn’t apply well in Florida. Building performance research is needed to evaluate and support implementation of specific efficiency practices in Florida. Research focus areas include:

- Energy efficient building technologies such as high efficiency HVAC for residential and commercial buildings
- Analysis of metered energy consumption data to increase effectiveness of Florida utilities’ Demand Side Management (DSM) programs

POWER GENERATION: MARINE HYDROKINETIC RESOURCES

Covering more than 70% of the Earth’s surface, the oceans collect and store the sun’s vast energy quite effectively, which is available 24/7 in various forms (tides, waves, ocean currents, gradients, etc.). Surrounded by the ocean on three sides, and with the second longest coastline of all U.S. states, Florida is uniquely positioned to harness marine renewable energy resources. Research focus areas include:

- Ocean Current Energy
- Ocean Wave Energy
- Ocean Thermal Energy
- Offshore Wind

HARNESSING FLORIDA’S SOLAR ENERGY

Florida has substantial solar energy resources and a strong incentive to enable power production for the grid, thermal desalination, clean fuel production, and solar cooling. FESC leads a rigorous and transformational solar energy research effort to develop the next generation solar energy technologies. The research focus areas include:

- Thin film and organic solar cell development and their systems integration
- Concentrated Solar Power (CSP) and high-temperature thermal energy storage development
- Solar fuel development for transportation - convert water and carbon dioxide to syngas then liquid fuels by using solar energy
- Heating, cooling and clean water by using solar energy
- Automatic permitting, automatic utility interconnection and autonomous operation of PV systems