

Florida Advanced Technological Education Center (FLATE)
Education - Technician Based Workforce
(Progress Report November 2013)

PI: Marilyn Barger

Description: FLATE (Florida Advanced Technological Education Center) will partner with FESC to develop statewide curriculum frameworks for technical A.S./A.A.S. degree programs supporting existing and new energy business sectors. FLATE will develop and have processed through the FLDOE the industry-validated student competencies of the frameworks. FLATE will also develop new courses required for each new program of study. Additionally FLATE will help state and community colleges implement the new frameworks in their institutions. To support the new curriculum, FLATE will work closely with the FESC Public Outreach and Industry Partnership programs to provide professional development opportunities for teachers and faculty to upgrade and update their knowledge base.

Budget: \$300,000.

Universities: FLATE/Hillsborough Community College

FLATE External Collaborators: Brevard Community College; Tallahassee Community College; Daytona State College; Central Florida Community College; Polk State College; Florida State College at Jacksonville; Valencia Community College; Palm Beach State College; School District Hillsborough County; Florida Department of Education – Division of Adult and Career Education; West Side Technical School; USF College of Engineering; Madison Area Technical College ATE project for Alternative Energy certifications; Milwaukee Area Technical College Energy Conservation and Advanced Manufacturing Center (ECAM); Florida Energy Workforce Consortium (FEWC); TECO; Progress Energy; ISTE (Ibero Science and Technology Education Consortium), Usurbil GLBHI (Spain); TKNKA - Innovation Institute for Vocational Training (Spain); Center for Energy workforce Consortium (CEWD); UF Industrial Assessment Center; CREATE NSF Center for Alternative Energy; EST2 NSF ATE Grant project; DOE's Office of Energy Efficiency & Renewable Energy; Gulf Coast State College; Palm Beach State College; University of South Florida's College of Engineering; University of Miami; University of Alabama; Rutgers University; Energy Reduction Solution, SMC Corporation of America, Energy Conservation Group; Florida Solar Energy Consortium; Tampa Bay Regional Business Plan Energy Efficiency and Conservation Sub-Committee.

Progress Summary

Since October 1, 2012 FLATE has achieved several milestones. Together with the National Science Foundation-funded Energy Systems Technology Technicians (EST²) project team, FLATE has developed a new Industrial Energy Efficiency (IEET) specialization for the Engineering Technology (ET) Degree and associated College Credit Certificate, in addition to the existing Alternative Energy Specialization. The IEET program framework has been approved by the FL Department of Education and colleges will be able to implement it in the 2014-2015 academic year.

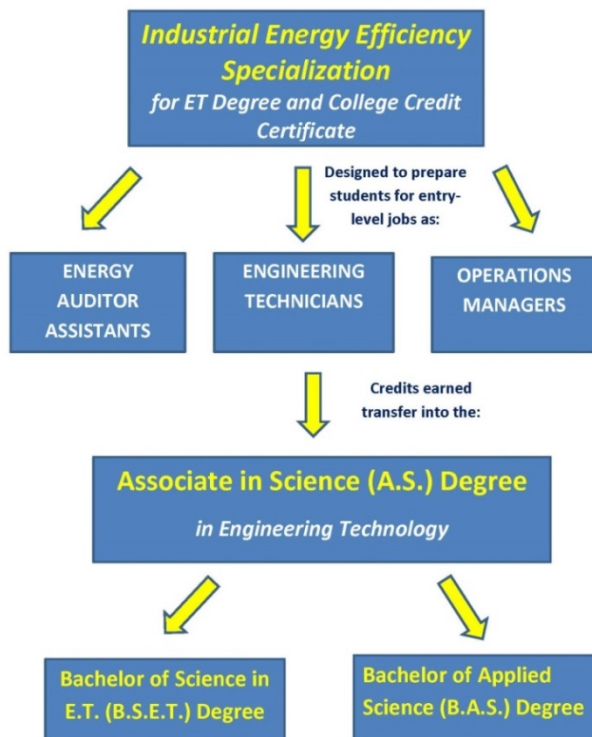
FLATE coordinated a second highly successful **energy workshop** (the last one was held in September 2011 in Gainesville), for high school and college educators, as well as industry partners, hosted by the Florida Solar Energy Center (FSEC) in Cocoa, FL on January 25, 2013. Forty attendees attended a wide variety of presentations, went on a tour of the amazing FSEC facilities and participated in a Professional Development activity focused on solar energy applications.

FLATE's **Third Annual Summer Energy Camp** was a huge success with the highest attendance ever and feedback from both teachers and students overwhelmingly positive! Thirty 7th and 8th grade students were treated to four days of exciting, hands-on activities centered on capturing and keeping their interest in STEM (Science, Technology, Engineering and Math) subjects – specifically renewable energy.

Finally, FLATE regularly updates / presents information about energy curriculum and training issues at the statewide Florida Engineering Technology Forum that meets twice per year at various colleges across the state. Many of these schools are looking to add “energy” curriculum and/or programs and are requesting guidance on what industry is asking for across the state and what and how other colleges are implementing credit programs. The goal of these activities is to keep colleges working together and sharing curriculum rather than develop independent programs not properly aligned to statewide frameworks. The ET Forum most recently met October 4 - 5 in Tampa at Hillsborough Community College.

Florida Advanced Technological Education Center (FLATE), Dr. Marilyn Barger

The development of the process for the Florida State College System to respond to FESC's long term strategy to bring energy related technologies out of the Florida University System is well underway. FLATE has the college contacts and process in place to respond to any FESC and/or regional economic development authority request to provide assistance to a designated State College. These requests can be focused on the technician workforce development need as identified or triggered by industrial partners, FESC university partners or from expanding energy-related companies' operations in the State.



Since October 1, 2012 FLATE has achieved several milestones. Together with the National Science Foundation-funded Energy Systems Technology Technicians (EST²) project team, FLATE has developed a new Industrial Energy Efficiency specialization for the Engineering Technology (ET) Degree and associated College Credit Certificate, in addition to the existing Alternative Energy Specialization. Experts from industry, government and academia have been involved in this collaborative effort and instrumental in ensuring that the new specialization is directly aligned with current industry needs. It will help students prepare to become a **SEP-Superior Energy Performance Certified Systems Practitioners** and **CEM Certified Energy Managers**. In addition, the program will train workers who will assist a company in achieving the ISO 50001 standards related to energy management, as well as ISO 14001:2004 to assure a company's stakeholders that measures are being taken to improve their environmental impact. Credits earned in this

certificate will transfer into the Associate in Science (A.S.) degree in Engineering Technology.

FLATE and FESC coordinated an Advisory Working Group Meeting in Orlando (DACUM), FL on February 2

28, to develop a curriculum plan for the Industrial Energy Efficiency Technician (IEET) Specialization. Sixteen members from academia and industry worked on the following focus statement for the workshop, "An industrial energy efficiency technician implements energy efficiency strategies in industrial processes and systems in order to improve an organization's bottom line and reduce environmental impacts." The meeting summary was circulated to the attendees and others who were not able to be there for final input. The finalized document established the courses that would be developed for the A.S. specialization tract in Engineering Technology and the related College Credit Certificate. The 7 new courses will have to be submitted to the state Common Course Numbering System office to be given a state number before they are available for colleges to adopt. As a result of the meeting, a comprehensive list of IEET Resources was compiled and classes were identified as well as their associated learning outcomes.



- Fundamentals of Industrial Energy Efficiency
- **Industrial Systems**
- Energy Benchmarking and Performance Analysis
- **Energy Efficiency Instrumentation and Measurement**
- Industrial Energy Analytics and Troubleshooting
- **Industrial Controls and System Integration**
- Industrial Energy Efficiency Capstone

The course creation validated the IEET program framework content that was submitted to the FL Department of Education for approval this year, and colleges will be able to implement it in the 2014-2015 academic year. Curriculum content modules are currently being developed to support the newly defined courses (from the DACUM) – available in Dec 2013.

Engineering Technology Energy-Related Programs as of January 2013

COLLEGE CREDIT CERTIFICATES	COLLEGES OFFERING
Alternative Energy Systems Specialist (CCC) Career Cluster: Manufacturing CIP #: 0615000003 Program Length: 18 (Primary) or 15 (Secondary)Credits	Brevard Community College, Tallahassee Community College, State College of Florida, Gulf Coast State College
Industrial Energy Efficiency Specialist (CCC) Career Cluster: Manufacturing CIP #: 061500000x Program Length: 21 (Primary) or 24 (Secondary)Credits	Florida State College at Jacksonville (2013)
A.S. DEGREE SPECIALIZATIONS (60 credit hours)	COLLEGE OFFERING
A.S. Eng Tech Alternative Energy Technology	Brevard Community College, State College of Florida, and Gulf Coast State College
A.S. Eng Tech Industrial Energy Efficiency	Florida State College at Jacksonville (2013)

Frameworks are posted on the FLDOE website:



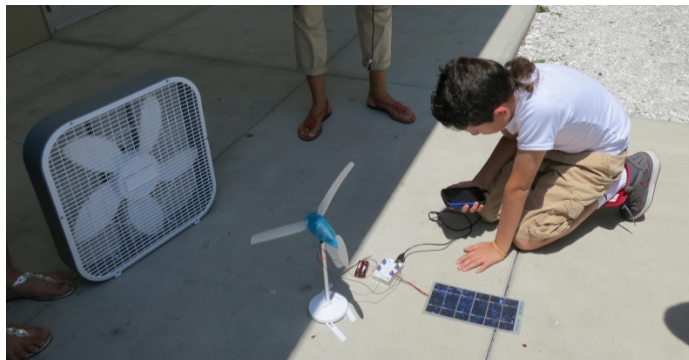
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FLATE's **Third Annual Summer Energy Camp** was a huge success with the highest attendance ever and feedback from both teachers and students overwhelmingly positive! Thirty 7th and 8th grade students from Beth Shields and Pierce Middle Schools were treated to four days of

keeping their Technology, specifically participating in the the many diverse the field of clean all part of District's AVID (Advancement Via Individual Determination) Excel Program, consisting of first generation college-bound, English language learners.



exciting, hands-on activities centered on capturing and interest in STEM (Science, Engineering and Math) subjects – renewable energy. By camp, students also learned about and exciting careers available in energy. Camp participants were Hillsborough County School (Advancement Via Individual



On the final day of camp, students raced hydrogen-fueled cars and were given a fabulous "Green" tour of Hillsborough Community College's SouthShore campus which is LEED (Leadership in Energy and Environmental Design) silver-certified by the USGBC (U.S. Green Building Council), and boasts an earth-friendly, energy-conscious functionality incorporating a number of sustainable features. These include solar

panels, a rainwater recycling process, maximum use of natural light and a raised-floor HVAC system that provides greater efficiencies for cooling. Students' feedback from the final camp survey illustrated strongly how much they learned about energy while at the same time having fun. Student comments included, *"The experiments we did were a magnificent experience for an 8th grader," "We got to be creative and at the same time learn something," "The thing I like about energy is we do these awesome projects of energy"*. One hundred percent of the students said that they learned new things about energy and 95% stated that they felt the camp would help them making future career choices with over half saying that they would consider a career in clean energy.

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Activities for the 2012-2013 year are listed below.

- Presented at the Florida Association of Science Teachers Conference in October, 2012 with Mark Dick (Tallahassee Community College), “Energy Camps that are Energizing”, highlighting the Teacher Energy Workshops and Energy Summer Camps for students offered over the summer by all EST 2 partners.
- Attended the Florida Energy Workforce Consortium Meeting in November 2012 and March 2013.
- Presented “Industrial Energy Efficiency Competencies for Associate Degree Programs”, at the Interstate Renewable Energy Council (IREC) Clean Energy Workshop in Albany, NY, November, 2012.
- Attended the Manufacturers Association of Florida Summit in December 2012 and surveyed 40 manufacturers about the need for energy efficiency trained technicians. The overwhelming majority of manufacturing members who completed the survey strongly supported the new IEET CCC since manufacturers need solutions to their high cost associated with energy consumption. A focus group meeting was held in Orlando, in February 2013 with industry, university faculty, tech center faculty and state college personnel/faculty. The focus group meeting was a scaled down, Designing a Curriculum (DACUM) that produced potential courses and course content for the proposed IEET program. The course creation validated the IEET program framework content that was submitted to the FL Department of Education for approval this year, and colleges will be able to implement it in the 2014-2015 academic year. Curriculum content modules are currently being developed to support the newly defined courses (from the DACUM) – available in Dec 2013
- Coordinated a second Community College Energy workshop for 40 attendees at the Florida Solar Energy Center (FSEC) in Cocoa, January 25, 2013.
- Was instrumental in the selection of Hillsborough Community College as a winner of the (Sustainability Education and Economic Development) Green Genome Award which recognizes exemplary community colleges nationwide that have taken a strategic leadership role in sustainability and green economic and workforce development.
- Attended and was part of an Energy Efficiency and Conservation Panel at 2013 Beyond Sustainability 37th Annual Conference at Hillsborough Community College, Plant Ybor City in February.
- Participated in, “An Energy Literate Citizenry from K-to-Gray: A Webcast on the Department of Energy’s Energy Literacy Initiative”, in March.
- FLATE hosted the Engineering Technology (ET) Forum in St. Petersburg in April, and in Tampa in October. (Energy Efficiency Specialization was presented).

- A third summer energy program for under-represented middle school students, was held July 8-11 at HCC's SouthShore Campus in Ruskin, FL in conjunction with the EST2 grant partners (BCC, TCC and FSCJ). We had the best attendance to date and teachers have requested that we add a high school camp next year.

Funds leveraged/new partnerships created: FLATE has leveraged its NSF and FESC resources to help Brevard Community College to apply for and be awarded a very competitive NSF grant, \$ 500,000, implement two energy related specialization within the A.S. Engineering Technology Degree. In addition, FLATE was able to secure a \$ 100,000 award from NSF to develop a faculty/student interchange that will allow Florida to benefit from the well advanced energy related technology educations practices at technology colleges in Spain.

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