Palm Beach State College
Palm Beach Gardens, Florida
Green Jobs Training

SCHOOL
Palm Beach State College / Palm Beach Gardens Campus, Public 4-year institution, serving approximately 49,000 students annually (four campuses); e.g. approximately 9,000 students enrolled Fall 2013 term at Gardens Campus, Palm Beach Gardens, Florida.

ABSTRACT
In December of 2009, at the direction of the President and District Board of Trustees of PBSC, the college established the Institute for Energy and Environmental Sustainability whose primary mission is to retrofit existing courses and create new courses of study and programs to meet the community’s need for a highly-trained workforce in emerging Green Industries. Since that time, Palm Beach State College has constructed alternative and renewable energy learning labs; assessed local green jobs workforce needs; formed partnerships with local green economy employers; and, developed curriculum to prepare students for green jobs.

GOALS AND OUTCOMES
Goals
PBSC has a long-history of Sustainability practices. Celebrating its 75th year, Florida’s first public community college reaffirmed its pledge to Sustainability in higher education by undertaking an institution wide initiative to develop courses and programs to meet the community’s workforce needs for the new and emerging Green Economy while simultaneously creating a “campus-citizen-community” of critical-thinkers committed to community outreach and service learning. The Sustainability initiative was both “top-down” and “bottom-up” driven, a demonstration of a college wide partnership involving all departments and operations. Case in point: in April of 2007 the first College-wide Sustainability Committee was formed. Participation was voluntary and at all levels of personnel. At any given time a minimum 50 members were involved in educational leadership and planning. In its first year the Sustainability committee joined the Association for Advancement of Sustainability in Higher Education, participated in a national teach-in focusing on Global Warming Solutions for America; created Web pages to report activities and progress. Overall, 15 subcommittees were active in review of a Sustainability framework, to name a few: Curriculum, Energy Management, Waste Management, Social Justice, Service Learning, Building & Renovation, Community Education & Partnerships. Building upon
this work, by early 2009 the Sustainability initiative became an imperative of the college. Using standardized templates created by the Office of Institutional Research & Effectiveness committees constructed an action plan reviewed by Academic Affairs, the Vice Presidents, Provosts and President of the college. In March of 2009 the college approved the 2009-2012 Strategic Plan of which Goal 4 affirmed: The College will promote and practice sustainability in all areas...develop and implement a framework for sustainability awareness...and establish an energy institute responsive to emerging green force industries and supportive of retrofitting existing programs.

Accomplishments and Outcomes
True to its commitment in December of 2009, the college established the Institute for Energy and Environmental Sustainability (IEES) and hired a full-time Director. First attention was given to Assessment of Green Workforce Needs. Accordingly, business and industry advisors, faculty and academic deans met with IEES to review Green industry needs for Palm Beach County, including Standard Occupational Classifications compiled by Bureau of Labor Statistics for 12 Green economy sectors (http://www.onetonline.org/); review and analysis of Economic Modeling Specialists Inc.’s (EMSI) occupational projections for 2008-2018 compared to Florida workforce “2011 Green Survey Report.” Analysis of data revealed positive growth trends for Green / Clean jobs, businesses and services associated with production of renewable energy, production of clean transportation and fuels and increase energy efficiency / energy management systems. Based on these results, AS degree programs were identified for Green curriculum improvement; specifically, Electrical Power Technology, Environmental Science Technology, and Biotechnology. With this knowledge in hand, an operational plan was developed to infuse Green economy skills across the academic and technical disciplines (see Table 1 showing the tasks and sequence of events designed to implement the plan).

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<thead>
<tr>
<th>TABLE #1: FIRST PHASE SUSTAINABILITY PLAN</th>
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<tr>
<td>Construct Alternative and Renewable Energy Learning Labs</td>
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<td>Solar and wind technology; solar energy generation, monitoring and storage</td>
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<td>BioFuels technology; small-scale production, processing, storage and distribution of BioFuels (e.g. Biodiesel; ethanol) using feedstocks common to Southeast Florida</td>
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<td>Smart Grid and Energy; energy systems management with focus on Power generation reliability, Distributed generation, and Home Area Network Management</td>
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<td>Curriculum development aligned to Green STEM jobs</td>
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<td>Develop new curriculum focusing on Carbon Management, Electric Vehicle Infrastructure / Solar PV, Advanced Transportation and Energy (Biofuels, Fuel Cell)</td>
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<td>Develop electronic “learning-object” library of instructional materials to provide substantive information and materials to support and reinforce learning overtime</td>
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<td>Critical-thinking and problem solving</td>
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<td>Focus on providing students with authentic learning experiences that tests students’ knowledge of learning-by-doing by measurable proofs-of-demonstration</td>
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<td>Develop course learning competencies and skills that build depth of knowledge for Extended and Strategic Thinking (e.g. Analysis, design, problem-solving, critique)</td>
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<td>Business and Industry Partners - Jobs</td>
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<td>Create a 1-year college credit certificate for Alternative Energy Engineering Technology</td>
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<td>Create curriculum maps to provide students with a clearly defined academic path for earning multiple-certificates and advanced college degrees in Green Industry sectors</td>
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Develop job shadowing and Internship experiences where students and industry partners work together to learn job roles and responsibilities leading to job opportunities

The strategy for retrofitting of existing programs to meet Green / Clean economy education and training standards was sound. For instance: Electrical Power Technology provided courses in electricity and industrial control systems for training in Clean and Renewable energy; Environmental Science Technology offered courses in compliance, safety, monitoring and measuring of environmental health and quality; Biotechnology provided laboratory and subject matter expertise for applied study of Bio-Analytics for Biofuels conversion.

In summary, over a period of two years, utilizing 90% of existing facilities and manpower resources, three new learning laboratories, four new college credit courses and a specialized college credit certificate were developed to support Green / Clean education. Labs deployed included: (1) Biofuels for training in processes / procedures for manufacturing Bioethanol and Biodiesel; (2) a first of its kind, “Integrated Solar and Wind Electric Vehicle Car Charging Port” with power console management system and Energy Kiosk “real-time” monitoring system for STEM problem solving tasks; and (3) Energy Management and Technology learning lab built upon the backbone of the college’s Industrial Controls Automated System with support from industry partners’ SCADA “power-analytic” software (e.g. OsiSoft) for advanced studies of Smart Grid infrastructure and management. Note: to achieve the latter Facilities collaborated with IEES in the smart metering of all ten buildings on the Gardens Campus. These labs serve as the authentic Green education learning centers for teaching and learning course objectives for four new 3-hour Renewable energy college credit courses; viz., Introductions to Solar, Biofuels, Hydropower, and Wind. Building upon these efforts the next action was to bundle three existing courses with three Renewable energy courses to create a 1-year Florida Department of Education approved college credit certificate in “Alternative Energy Engineering Technology.” Most measurable benefits to date have been hiring of Electrical Power Technology graduates by business & industry partners; e.g. Next Era Energy / Florida Power & Light, South Florida Water Management District, Sikorsky Helicopters.

Challenges and Responses

Challenges to implementing an effective “Sustainability education & economic development” program lie with issues in defining what is a Green economy occupation and traditional policies that checkmate efforts in creating Green workforce training programs. More specifically, Green programs cannot be developed without hard evidence of jobs and the knowing that to become a proficient worker at a Green job requires STEM skills which are learned most effectively when undergraduate research is a part of the core learning outcomes of a workforce training program.

To overcome these challenges IEES working with academic, student learning and student activities are testing novel programs to directly impact the students’ first year learning experience. The goal: advance student learning and enhance retention by reforming the workforce training model to address four needs of the Green learner: (a) developing Green career maps; (b) solving misconceptions regarding AS versus an AA degree; (c) increasing internship opportunities with business partners as part of the undergraduate curriculum; and (d) creating Mentor programs that match the learner to the Green job. Without going to deep, here is the gist of the matter: Recognizing that STEM skill-sets are a necessity to gaining employment in today’s advanced Green technology world, the reformed student learning model postulates that students must early-on in their program receive in-depth knowledge of Green careers (i.e. definitions, tasks, wages); must gain understanding of the importance of the AS program to provide...
applied learning experiences necessary to perform proficiently at actual job related tasks, thus giving them a head-start beyond what is typically provided in a General Education track; must explore and work with industry partners on technical activities and tasks equal to the job they will be expected to perform (e.g. redefining the meaning of undergraduate research); and throughout their two-years of study be provided with two very different kinds of expert support – a Tutor serving as a supervisor of learning and a Mentor-Guide as a stabilizer (i.e. a person or persons that gives guidance in things important to achieving “affective” communication behaviors for problem solving and critical thinking).

This model known as the “Green Paragon for Life Long Learning” is currently being tested to assist first year students in learning character habits and attributes associated with the “Green Whole-STEM Learner”. Activities include: one-on-one workshop with a Mentor Guide to create a Green career map; faculty teaches a STEM principle aligned with a Green job task whereupon students demonstrate the principle by producing a learning object for the repository (e.g. graphic design, 3-D model); creating an Incubator agreement with startup businesses to lease lab space for research and development that actively involves students in the research task(s) under study. A good example of the model at work was the 2009 Mentor Academic Authors project that trained Environmental Science and Biotechnology students in how to prepare and submit a journal article of publishable quality. At the end-of-the competition six students became published as recorded in the U.S. Library of Congress and due to their contribution the college received the 2010 Chancellor’s Award for Best Practices in Florida Colleges.

**Campus Climate Action: Your School’s On-Campus Sustainability Projects**

Measurable evidence representative of success include producing “campus-citizen” sustainability events such as: Green Graduation Pledge; Community Supported Agriculture (CSA) project; Organic garden at the Center for Early Learning to teach children ages 1 to 5 the cycle of food from seed to plate; Student Activities club events (e.g. fund raising for Haiti Relief, Turtle rescue, Water Restoration/Beach cleanup); 3rd Annual 2012 Earth Day serving 300 Green meals with student displays of Green arts; 4th Annual 2012 Green Expo attended by 1500 featuring over 70 exhibitors providing information about Green Sustainability programs; staging of exhibits at business and community supported conferences (e.g. 2011 South Florida Fairgrounds Green education showcase drew 20,000 visitors).

**Commentary and Reflection**

PBSC has made Sustainability and Green economy education for workforce development a “systemic institutional” initiative. All of this work taken together provides the evidence of the college’s willingness to safe keep and to hold steadfast to its commitment to the advancement of Sustainability in higher education.

As a look into the future, the college will utilize the 2012 AACC SEED’s Green Institutional Self Assessment Tool to develop effective SEED programming by: working with secondary academies to prepare students for college readiness; increasing internship opportunities by providing novel undergraduate experiences for worker-ready employment; developing articulation agreements with state universities based on new Florida guidelines for AS degrees; measuring student success by challenging them to make things that demonstrate level of Green skill proficiency by proofs-of-demonstration.

**ENGAGEMENT AND SUPPORT**

**Leaders and Supporters**

Dr. Dennis Gallon, President, Palm Beach State College

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Mr. Dick Becker, Vice President, Business & Administration Services  
Dr. Jean Wihbey, Provost, Palm Beach Gardens Campus  
Mr. John Wasukanis, Director, District Facilities Management  
Dr. Jay Matteson, Director, Institute for Energy & Environmental Sustainability  
Mr. Mike Merker, Director, Technology Infrastructure  
Mr. Frank Atkins, Facilities Manager, Palm Beach Gardens Campus  
Dr. Grace Truman, Director, College Relations & Marketing  
Ms. Joyce Edelstein, College Relations & Marketing Specialist  
Mr. Oleg Andric, Chair and Professor of Electrical Power Technology  
Ms. Marjorie Simon, Learning Specialist  
Ms. Tracy Joinson, Counselor / Associate Professor  
Ms. Patricia Castro, Administrative II  
Ms. Deborah Forsten, Business & Education Development Specialist  
Ms. Susan Setterlund, Librarian / Professor I  
Ms. Jessica Miles, Chair Environmental Science Technology / Professor II  
Mr. Dan Morris, Adjunct Instructor Solar Technology, Electrical Power Technology  
Ms. Angela Allen, Student Activities Manager  

**Funding and Resources**  
Fund for Improvement of Postsecondary Education, U.S. Department of Education: $150,000 for purchase of equipment and technology to support IEES initiatives  
Built-in campus budget for basic infrastructure development; e.g. pour 2 concrete slabs, install sprinkler system, install wiring, connectors, instrumentation  
Perkins: purchase of equipment for bioethanol distillation  

**Employer and Other School Partnerships**  
Next Era Energy / Florida Power & Light  
South Florida Water Management District  
Hypower, Inc.  
Skanska USA  
Agilis Engineering, Inc.  
Venergy Group  
OSisoft  
Business Development Board of Palm Beach  
Eco-Advisors  

Each of the above provided subject matter experts to develop curriculum, teach workshops, serve on business & advisory council  

**National Wildlife Federation’s Campus Ecology Program**  
NWF Webinars were useful in this project.  

**CONTACT INFORMATION**  
**Contacts**  
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Case study submitted by: Jay Matteson

MORE ABOUT YOUR SCHOOL
Campus Sustainability History
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Image Credit: Jay Matteson, PhD, MS / Director IEES