

Going Green at Penn College!

Energy-Related Activities in Academic Schools and Other Departments

Construction and Design Technologies

Curriculum

- Presently, we have a new B.S. degree (2+2) before Curriculum Committee for approval in Building Science and Sustainable Design. This new B.S. covers a multitude of Green-related topics in preparing a student for the job market in all aspects of Green building and sustainability. It is designed to draw from many construction-related programs, as well as possibly management-related programs.
- Development of a new, two-year A.A.S. degree in Renewable Energy Technology. The program will feature courses in wind turbine, photovoltaic, hydro turbine, solar hydronic and energy storage. A needs-assessment survey has been sent to more than 200 employers in renewable-energy-related fields. A focus group will commence in January.

Staff Development

- Jon Hart and Wayne Gebhart attended a Wind Symposium held at Penn State for wind turbine. This will be very beneficial for the offering of a program in renewable energy.
- Jon Hart, Wayne Gebhart and Jeff Weaver attended the Solar Scholars program at Dickinson College. This was covered by a Solar Scholars grant by the Sustainable Energy Fund. The attendance at this first stage qualified Penn College to apply for a grant of up to \$15,000 for a 3KW PV panel array to be installed on campus.
- Dorothy Gerring accompanied 13 students to Boston for the Green Building Expo, held Nov. 18-20. The Expo allowed students to see firsthand what Green building is all about. The students also had an opportunity to work with vendors and garner an abundant amount of information.
- Rick Sarginger and Rick Druckenmiller attended a Green Building Seminar in early fall in Harrisburg. The seminar focused on construction practices for the Green initiatives.

Grants

- A \$15,000 grant was awarded to the School of Construction and Design for the installation of a 3KW Photovoltaic panel array on college premises. The grant will

subsidize three-fifths of the project cost, as outlined in the grant proposal and application. The grant was awarded to 12 colleges throughout Pennsylvania. The panel will be grid-tied to the Victorian House and be monitored for its energy production and cost savings.

Equipment

- We continue to receive donations for the BBT program from manufacturers that provide energy-management functions. The building-automation industry is the leader in energy management and conservation. The graduates from this degree continue to see steady and well-compensated employment that lends to energy-management protocols.
- We continue to add to our portfolio of equipment those items that can demonstrate energy-efficient applications, such as thermal imagers, new A/C units that maintain industry-standard energy efficiencies, and air-side products that allow for efficiency monitoring of air-side HVAC operations.

Health Sciences

We use ANGEL to post syllabi/course outlines/assignments/etc., and we leave all the links open during the entire semester for students' viewing, which makes most printing unnecessary.

Hospitality

Composting – We have been sending most of our food scraps to the Earth Science Center to be composted. A grant may be available to support this process, as there are some additional costs involved with collection, transport and compost management.

New Unimac laundry machine – We installed a new washer in November – energy, water and cleaning supplies should be conserved through variables such as improved programmable electronic controls, smaller drum size and higher extraction speeds.

Other newly acquired equipment that should provide energy-efficiency benefits include:

- Hoshizaki ice cube machine
- Continental freezer and refrigerator – both Energy Star-rated

Plastic Recycling – Our food areas produce significant amounts of plastic containers, so the arrival of plastic recycling was very welcome in our area.

Projects in Process

- Researching plastic screen doors for our large walk-in refrigerator and freezer to reduce loss of energy when doors are opened
- Seeking to replace disposable cups with plastic reusable cups for student and staff use during long labs and shifts

Industrial and Engineering Technologies

Electronics

- We have two students, Patrick Potter and Curtis Wrable, who are working on a senior project to evaluate the viability of alternative energy sources in Williamsport. Their intent at this point to evaluate the feasibility, cost and return on investment of solar electric, solar heat, wind, heat pumps and whatever else we think up before the end of spring. We hope to purchase a small solar electric panel and a wind-speed detector (anemometer), install them outdoors, and monitor the potential energy generation from these sources vs. their cost. Our intent is to have a computer and display in the building that will plot the data obtained and store all of the results in a database for further study. They will also contrast these costs with more traditional energy costs.

Plastics

- We have done substantial work in Green plastics, primarily PLA. This work includes several ANTEC papers and senior projects.
- We also have done work in recycling and reusing XLPE used in rotational molding.
- Also from John Bartolomucci detailing these projects: (see below):

Plastics and Green - Polylactic acid, or simply PLA, is becoming a mainstay of biodegradable materials for use in disposable packaging as well as implanted bio-absorbable medical devices. PLA for plastics packaging is made from corn and eventually converted to the polymer PLA via a fermentation process. This Green material has been studied by students in several of our plastics courses over the past three years through projects in PPT 315 (Plastics Testing), PPT 249 (Project Management), PPT 415 (Polymer Synthesis), and MET 495/496 (Senior Seminar Lecture/Lab).

- During the past three years, projects using PLA resin and the Penn College polymer-processing and -testing labs have resulted in:
 - Senior capstone project by Matt Reichelderfer, BPS, 2006, on compatibility of PLA resin with several commercial polymers and additives
 - A 100-percent bio-derived composite material based on PLA and ground wood or wood flour; the latter long used in the plastics industry as a plastics filler or extender
 - A 2008 SPE student ANTEC paper published and presented by Jon Lazarus, BPS, 2008, on effects of e-beam irradiation of PLA on polymer viscosity and melt strength

- A 2009 accepted student ANTEC paper to be published and presented in June 2009 or May 2010 by current junior students Brad Stroup and Zach Poust building off of last year's research and focusing on m e-beam irradiation modification of PLA for higher melt strength as would be required for use in extrusion blow-molded packaging. The latter, if successful, may present intellectual-property opportunities.
- A second 2009 SPE-accepted student ANTEC paper on injection molding regrind stability of PLA resin to be published and presented in June 2009 or May 2010 by junior students James Gorham and Alan Tate
- Production of a PLA based nano-composite and evaluation of the effects of nano-sized clay particulate filler on the melt strength of PLA resin

Natural Resources Management

- Alternative Fuels Powered Generator – Faculty members Claude Witts and Paul Zenga, along with our DSM 249 Alternative Fuels class, are working to convert a Ford V10 powered Olympian P60 generator (60 KVA) to run on propane. Jim Lloyd from CAT dealer H.O. Penn has his staff engineers helping our faculty. They have been through the process before and have contributed money towards the effort.
- DSM 287 Automated and Hybrid Drive Systems – This is a part of the recent diesel curriculum revision. This class was updated by faculty Mark Sones. Mark has completed several industry training classes from truck hybrid drive system leaders Eaton and Allison. Information and materials from these industry courses have been added to new course DSM287.
- Electrical Generating Systems Association – Three of our power generation students and faculty member Paul Zenga attended this conference. The POWER-GEN International ran from Dec. 2-4, in Orlando, Fla. The conference features a trade show along with our students attending their “Basic School.” This “Basic School” is a 24-hour class over three days covering a wide range of industry topics. We use funds from the Caterpillar Foundation to help fund this opportunity.
- Composting at the ESC – This is an ongoing project. Our horticulture department works with Food Services in a pre-table food scrap composting operation. These scraps and other organic debris from the ESC are used to produce the valuable compost. The end result is we use the compost on the grounds at the ESC versus harsh fertilizers.
- Horticulture Working with Construction Specialties Group in Muncy – This is an ongoing project which had horticulture faculty member Carl Bower and his classes helping to design an environmentally friendly employee area on the company's property. Planned improvements include green spaces for employees and their families, recreation trails, and other ideas to help “Green” the company. The project may involve heavy equipment operator and forestry students as the project moves towards the construction phase.

Transportation Technology

- EcoCAR NeXt Challenge - We are in support of the Penn State entry in the three-year contest to “design and build advanced propulsion solutions that are based on the vehicle categories from the California Air Resources Board zero emissions vehicle regulations.” This involves alternative energy (hybrid power), alternative fuels and staff development along with student club involvement.
- Hybrid Course - We just proposed a one-credit hybrid propulsion system course to be included in the generic automotive and collision programs. Both Honda and Ford already have course information embedded, and we are about to get another hybrid Ford Escape.
- Fuel Cell Contest - We annually host (past two years) a fuel-cell contest for high school students at Penn College in the spring.
- BAU - We have a three-credit alternative-fueled vehicle course in the junior year, and we have a CNG station at the AATC, along with a CNG engine on the dyno, and have done a vehicle conversion to all CNG on one of our Ford trucks.

Workforce Development & Continuing Education

Weatherization Training Center

- WTC provides its participants with broad-based education in many aspects of building science along, with the technical skills necessary to meet the program goals of reduced energy consumption, health, safety and comfort for occupants of homes who qualified under Department of Energy Weatherization Assistant Program. Weatherization is a collection of procedures designed to reduce energy consumption, increase comfort, improve durability, and enhance health and safety. Energy retrofits on existing homes include window and door treatments, insulation, as well as heating system and base-load improvements.

Energy Star Certification for New Construction

- The Factory Built Housing Center has been working with the factory-built housing industry stakeholders for the past three years on how to better integrate the Environmental Protection Agency’ Energy Star certification process into the modular industry. The result has been many modular manufacturers in the state beginning to produce units that meet the criteria and capitalize on a niche market. This work has been supported by the Central Pennsylvania Factory Built Housing Industry Partnership. The FBHC has also been able to establish some high-profile strategic alliances associated with the Energy Star program. These programs include the EPA and RESNET, who are two of the main national organizations that oversee Energy Star for new construction and existing homes.

Green Building Research and Consultation

- The FBHC has positioned itself to respond to the needs of the industry by continuing to acquire training and industry-recognized credentials. (see last section for specific affiliations) It also facilitates training by bringing in outside professionals who can deliver fresh, new perspective to the FBHC stakeholders. Continued support by the Factory Built Industry Partnership has enabled the project manager to provide training resulting in certification by the NAHB Green program, Green Advantage Commercial, and Green Advantage Residential programs to over 120 members of the PA FBH workforce in 2008. The FBHC plans to continue this training into 2009.

Building Science for Modular Construction

- The FBHC embarked on a mission as a result of its work with many companies in the Energy Star and Green initiatives. FBHP has submitted a proposal into the Workforce Investment Board to conduct a combination training and consultation that will result in completing the entire certification process of a home to be Energy Star and NAHB Green qualified. This would enable companies and their supply chain to be involved in the process, learning the steps for future projects. Utilizing existing Penn College staff, an initiative to deliver more building science training to industry is also an objective through training and consultation. This includes training to certify internal QA/QC personnel in modular plants through RESNET using FBHC/Penn College trainers. Once the industry personnel have been designated by their respective companies, the FBHP will be conducting a four-day training followed by a national testing program to earn RESNET designation of inspector field rater.

Plastics Manufacturing Center

- Although the PMC does not have any specific energy projects, the PMC is involved with some programs that have a Green or energy perspective. The PMC is working on a program to develop materials which are biodegradable and compostable to reduce plastics in landfills. PlasticsSourceNet is the program manager of a plastics consortium for the Central Pennsylvania Region with goals to have the industry become more energy efficient and environmentally friendly.

Facilitation of Seminars and Conferences

- Fundamentals of Energy Star Certification, February 2008
- Web Site and Marketing Mini Sessions, June 2008
- Energy Star Workshops at Modular Manufacturers, June 2008
- NAHB Business Management Course, June 2008
- NAHB Green Building Professional Course, June 2008
- Green Advantage Residential Training, April 2008
- OSHA and Safety with Modular Construction, May 2008
- Introduction to Building Science for Modular Construction, October 2008
- PennBOC Conference Trade Show Annual Meeting, October 2008
- Green Advantage Commercial Training, October 2008

Energy Efficiency and Sustainability Affiliations

- Energy Star Partner – Recognized as an organization that encourages energy-efficient construction through its FBH industry training and consultation
- RESNET Partner – Developed training and certification for HERS field inspector designation – January 2009
- Green Building Alliance Partner – Training, education and applied technology associated to further integrate Green technologies and building systems
- Ecohealth Design Partner – Incorporates healthy house design principles into building systems

College Information & Community Relations

- Offered option of online holiday card in 2008
- Launched online version of One College Avenue in 2008
- Print One College Avenue magazine using recycled paper
- In recent years, reduced direct-mail promotions to save printing and postage costs and introduced online PCToday to share news and information electronically with students, employees and the public