

West Chester University - Green Report 2009

Student Population: Full-time equivalent – 11,653.5

Staff Population: Full-time equivalent - 741.67, FTE Faculty is 677.33

Education and General Space: Gross – 1,581,424; Net – 959,314

Campus Real Property Footprint: 403 acres

1. Green Management

Guaranteed Energy Savings Agreement (GESA) – West Chester University (WCU) has completed the construction phase of its \$20+ million GESA. This work has affected virtually all buildings on campus. Energy conservation measures completed



include: water conservation improvements (in most buildings), installation of solar film on windows in four buildings, weatherization (and/or replacement) of many exterior doors covering most buildings, insulation of steam piping in all the buildings served by the Heating Plant, the upgrade/replacement of more than 20,000 light fixtures and installation of ~1,500 light switch occupancy sensors in virtually all buildings. Substantial improvements have been made to the HVAC systems in seven buildings. Natatorium improvements include newly installed and operating UV water purification systems and dehumidification systems.

One of the most significant measures is the installation of a campus-wide Energy Management and Control System which provides remote monitoring and control of the HVAC in all of the major buildings, and is already

substantially improving the ability to monitor and control the comfort level in these buildings, generating savings by more accurately controlling equipment operation.

Other improvements which have been completed include: new cooling towers at Main Hall and Lawrence Dining Center, installation of electronic cooling tower water treatment systems (that are more effective, efficient and eliminate the use of chemicals) on all of the cooling towers, and installing Spirovent solids separator units in the hot water systems of most buildings. These will more effectively remove dirt and impurities and improve the system efficiency. The final construction task was: the geothermal conversion of Francis Harvey Green Library.

The program's goals include overall savings in electricity of 25% (12 mKwh), in natural gas of 50% (266,389 therms); No. 2 fuel oil of 45% (115,000 gallons), and 25% water (22 million gallons). This will result in



an annual reduction of pollutants of approximately 7,800 tons of CO₂, 5,300 tons of

SOx, and 19 tons of NOx.

Green Curriculum - The Environmental Council is developing a new sustainability website: www.wcugreen.org.

In February 2009 the ACEER (Amazon Center for Environmental Education and Research) Foundation sponsored a visit from Mitch Thomashow, President of Unity College in Maine who met with students, faculty, and administration; conducted a workshop on Integrating Sustainability across the Curriculum; and gave a public talk. The Environmental Council was a co-sponsor. The ACEER Foundation was the lead sponsor, and the visit was made possible in part from an Academic Affairs grant.

A representative from the Division of Student Affairs worked with the WCU Environmental Council to examine how Student Affairs can actively participate and collaborate in University-wide sustainability efforts that are currently underway or being planned. The leadership of the Environmental Council was invited to a Student Affairs staff meeting to give an overview of their priorities along with a discussion on how we can support efforts for a “greener” campus.

A Green Jobs Forum was held in February with a turnout of about 300 people. A book discussion panel on Thomas Friedman’s *Hot, Flat, and Crowded* was held.

Dr. Lynne Cooke of the English Department and students in her business writing service learning course collaborated with Royston Gathings of the WCU Recycling Program to conduct surveys about student perceptions of the program. Another group of students will follow-up with creating a peer outreach program about recycling.

Dr. Paul Morgan (College of Education) prepared and gained approval for two new certificate programs in education for sustainability. These certificate programs (one undergraduate level, the other graduate level) will enable our graduates to teach environmentally sustainable principles in the classroom and promote environmental changes in the school and community.

The WCU Environmental Council submitted a Presidential Initiative Grant for a six-credit Alternate Work Assignment (AWAA) for a Director of Sustainability.

In November 2008 WCU sent four representatives (Hal Dean, Marianne Peffall, Robert Malone, and Paul Morgan) to Raleigh, NC to attend the AASHE 2008 Conference and Expo. AASHE is the Association for the Advancement of Sustainability in Higher Education. With more than 1,700 attendees, it was the largest ever gathering focused on campus sustainability (www.aashe.org).

2. Green Buildings –

- a. **Swope School of Music and Adler Performing Arts Center:** The University continues to pursue LEED silver certification for the new construction of this facility. All documentation has been submitted to US Green Building Council, and we are awaiting final determination.

b. **25 University Avenue:** In August, 2008, University completed renovation to



one of our existing academic buildings to house mathematics, computer sciences and student services. Incorporated into that design was the provision of a 47 well geothermal system, installed under the front lawn of the building.

In addition, the renovation included such LEED design principles as recycled construction material, recycled waste management, passive natural lighting, and an energy recovery system.

c. **Green Roofs:** The University has completed its survey of existing facilities and has identified two locations for the installation of new green roofs – the Merion Link to our Science Center and the Francis Harvey Green Library. Design work is underway, with implementation scheduled for spring, 2010. In addition, the University has committed to the provision of a green roof and contiguous green wall in the design of our New Student Recreation Center, construction of which is also scheduled to begin spring, 2010.

3. Land Use

Gordon Natural Area for Environmental Studies (GNA)

Visit the Gordon Area website: www.gordonarea.org

The GNA was dedicated in 1973 as WCU's response to EARTH DAY. Its mission is to promote environmental education & research and to protect biodiversity. Twenty classes from five departments currently use the GNA. Two research grants were completed in 2008, one in ongoing and one is new (total funds \$85K). Biodiversity has suffered since 1973 because of increases in deer populations and non-native invasive plants. A recent inventory conducted by USDA APHIS estimated 80 deer on the property. To protect and enhance biodiversity there should be about five deer using the property. The only two viable solutions for deer are fencing and controlled hunting.



A plaque was dedicated for the late Dr. Bill Overlease (Biology 1963-1986) on April 18, 2009. Dr. Overlease was instrumental in working with the Board of Trustees to make the Gordon Natural Area for Environmental Studies a reality in 1973.

*Dr. Lori Vermeulen, Dean of Arts & Sciences
& Edith Overlease*



Plaque dedication to Dr. Bill Overlease

First Outdoor Classroom/Laboratory Dedicated at WCU April 21, 2009

In celebration of EARTH WEEK 2009 WCU's President Weisenstein dedicated our first outdoor classroom/laboratory. This area will promote the use of native plants to attract insects and birds to the site. An assortment of bird feeders is part of Cornell University's Project Feeder Watch Program (www.birds.cornell.edu/pfw). The area is certified by the National Wildlife Federation's Backyard Habitat Program and Audubon's Bird's at Home Program. Rain barrels, green walls, warm season grasses and green roof are planned for the area. Students will be exposed to sustainable environmentally approaches/technologies they can take to their parents' homes now and their homes after graduation.



WCU's President Weisenstein dedicated our first outdoor classroom/laboratory.



First Outdoor Classroom/Laboratory

Presidential Initiative Grant - The Facilities Department (Ed Bruno), Biology Department (Gerry Hertel and Win Fairchild), and Geography and Planning Department (Joy Fritschle, Gary Coutu and Joan Welch) submitted a Presidential Initiative Grant that was awarded to create an updated digital database of trees on north campus. The database was created with Global Positioning System (GPS) units and students collected the location of each tree and numerous characteristics of the trees to create a Geographic Information System (GIS) database. This database of trees on north campus will provide for an excellent management tool as well as research opportunities. With this database, faculty and students will be able to calculate how much carbon dioxide and pollutants are taken up by the trees. The GIS database will allow for evaluation of other environmental benefits provided by the tree canopy on campus.

4. Green Power

Energy Management Reduction

Geothermal HVAC Initiative – West Chester University currently heats most of its North Campus buildings with steam supplied by a coal/oil-fired central plant. While still reasonably efficient and cost effective, this plant is becoming increasingly dated in terms of the cost to maintain it and the underground distribution system. Moreover, its environmental impact, especially from burning coal, is a concern. Our studies have shown WCU can reduce its heating cost by 40% and cooling costs by 20% by converting this portion of our campus to use a district geothermal (geoexchange) system. This equates to a savings of more than one million dollars per year. Based on these conclusions, the University has launched a program to phase-out steam heat and conventional chilling systems by replacing them with a centrally-operated geothermal system. This includes a number of phases accomplished over many years.



First, a geothermal HVAC system was installed as part of the renovation of our academic/administrative building located at 25 University Avenue. This 53,000 square foot building is our first geothermal classroom and office building, expected to save the University approximately \$645,000 over twenty years in reduced maintenance and energy costs, as well as to avoid emitting 350 tons of CO² into the local air.

Second, as part of a program whereby

the University has begun the replacement of our old North Campus residence hall buildings with new buildings that are based on geothermal HVAC, we have begun construction of a North Campus Geothermal Loop that will use a shared well field located in an area of the campus where it is least likely to impact future growth, together with a central pumping station to serve all of the buildings to be constructed or converted to geexchange.. The first two of six new residence halls have been constructed and are expected to be operational by the fall of 2009. The geothermal wellfield and distribution piping for these buildings is in place and ready to support them.

Third, the University is nearing completion of converting the FH Green Library to geothermal HVAC and has a design ready to convert Ruby Jones Hall, as well as a preliminary design to support converting Anderson Hall which already employs water source heat pumps. To support these buildings, as well as others in their vicinity, a contract is being awarded to complete the design and construction of the central pumping station, together with additional geothermal wells and to extend the geothermal distribution system to the Academic Quad area where it can tie to the Library as well as these other buildings. The construction of this phase is expected to begin in late 2009 and be completed by the spring of 2010.



Fourth, as part of the impending design effort, additional geothermal distribution extensions will be designed to accommodate a planned Student Recreation Center and additional new Residence Halls. Construction of these is planned for the second half of 2010. As funding becomes available, the University has preliminary planning in place to convert additional academic and general buildings, install the additional geothermal wells to support them, and extend the geothermal distribution system to reach them. The overall plan anticipates extending the North Campus Geothermal Loop and converting/tying-in additional buildings over a period of 10 years, eventually reducing the heating plant load to near zero. This will yield substantial energy savings and would eliminate the use of coal.



The goal is that West Chester University will no longer pollute the air with ~50 tons of NOx, ~80 tons of SOx, and ~20 tons of particulates on an annual basis and would become “greener.”

5. Green Procurement

WCU is using Johnson-Diversey's GreenSeal certified cleaning products to clean all of our buildings. "Green" cleaning requires the use of only sustainable cleaning products whose ingredients are not derived from non-renewable resources. Sustainable ingredients shall represent a minimum of 80% of the active ingredients (other than water).

Green Cleaning - Custodial Services at West Chester University has for over three years used exclusively GreenSeal recognized products. WCU is now "green" cleaning three high-profile buildings using U. S. Green Building Council and Johnson-Diversey recommendations; School of Music and Performing Arts Center, 25 University Avenue and Sykes Student Union. Custodial staff members in these buildings are specially-trained in the use of micro-fiber and air pollutant containment equipment with HEPA filters. We are currently implementing a full "Green" program for the Science Center. Once expedited, over 400,000 sq. ft. of space will be cleaned utilizing true "green" practices. All cleaning procedures will be modified with the health and safety of building occupants in mind.

While selecting the right products is of critical importance, it is of equal if not greater importance to make sure cleaning personnel are using the products correctly. Training on appropriate product dilution, use and disposal can have a huge impact on reducing impacts on worker and occupant health, as well as to the environment. Sometimes the greatest effect we can make in terms of reducing impact around our most vulnerable building occupants is not the product, but rather how and when the product is used. Thus, the appropriate training remains ongoing and focuses on creating safer, healthier and more productive environments for our building occupants.

Our Green Cleaning program has integrated a new approach to how we intend to purchase all of our materials going forward. In addition to product performance and cost, our goal is to closely scrutinize the purchase of all of our products no matter how large or small and consider the potential health and environmental impacts of those products. New cleaning industry technologies have allowed us to find, for example, micro-fiber mops and dusting cloths that allow us to clean effectively using less chemicals and water, as well as plastic containers manufactured from recycled content.

We are committed to addressing as many opportunities as possible which will result in reduced environmental impact. A new Green Purchasing Policy will be developed along with a new Website.

6. Recycling

Recycling Program On The Rise - WCU's Recycling Program underwent a major revitalization in January 2008. Features of the new program include: the combining of aluminum cans, food cans, bottles, and plastic into one collection container, and a renewed effort to collect mixed office paper in large quantities. To avoid waste contamination in the recycled paper, 96-gallon Toters were placed in each building on

campus to collect the mixed office paper. From there the paper is transported to a compactor used exclusively for mixed office paper. At the same time, containers for commingled items (aluminum, food cans, glass, and plastic) were cleaned, re-labeled, and re-positioned in the hallways of each campus building and classroom. As a result of this new thrust, recycled paper has increased significantly, and we participated in the national Recyclemania competition for the first time. For the 2008 calendar year, the amount of recycled paper and cardboard more than doubled, and the collection of commingled items increased by 12.6%. The total recycled tonnage increased by 85%, and the Waste Diversion Rate increased by 86%.

7. Green Transportation

New bike racks were installed at Swope Music Building and Performing Arts Center, eliminating the practice of chaining bikes to the light poles in front of the building.

Shuttle Bus System - West Chester University has been operating a shuttle bus system for 35 years. It is operated seven days per week during the fall and spring semesters with buses running until 1:00 am. There is also limited service during Summer School. On a typical class day, 3,700 students are transported via the shuttle bus, thus creating a substantial savings in emissions and parking demands.

Compressed Natural Gas Fueling Capabilities Enhanced – A year of transition, 2008 was an affirmation of West Chester University’s commitment to alternative fuels in order to be “green,” reduce our dependence on foreign petroleum products, and save money on a cost/BTU basis. Further, the University has reduced the number of vehicles in its fleet from 90 to 86, and hopes to increase the number of vehicles using alternative fuels in the future.

The University’s fueling infrastructure was replaced with facilities at a new location beginning in April, 2008. Although it wasn’t until mid-June that everything was “online”, the new equipment now allows the University to continue its existing Compressed Natural Gas (CNG) program with added flexibility and reliability, and to add BioDiesel B20 as a replacement to traditional Diesel fuel.

The existing ANGI Int’l fast fill CNG fueling station was moved from its old site to a new location across campus. Additionally, the facility now boasts a FuelMaker slow-fill unit. The University’s fleet of 86 vehicles includes 23 run on CNG. Two of these operate at an older standard of 3000 psi which is easily accomplished by the slow fill FuelMaker. Having a second means of fueling for our fleet enables us to increase the primary station to fill newer vehicles to their intended 3600 psi. Vehicles will enjoy a longer range between fills, and fewer trips to the station. This, combined with the fact that the new location is adjacent to where the majority of vehicles are parked, will result in less fuel being used to get fuel. When, during the summer of 2008, gasoline prices rose to over \$4.00/gallon, CNG (dispensed in “Gasoline Gallon Equivalents” or “GGE”) was costing approximately \$2.40/GGE.

Biodiesel – New fuel storage tanks were installed for Gasoline and Diesel fuel. This long-anticipated upgrade allows for the University to finally move to using BioDiesel B20. B20 is a blend of 80% Diesel and 20% “Bio” fuel, and is now being used in the University’s six heavy trucks, as well as all diesel-powered grounds equipment and the backhoe. BioDiesel is cleaner burning, results in better performance from engines, and is made partly with renewable resources.

Since the filling stations were closed temporarily during the move process, 2008 fuel consumption statistics are incomplete. However, WCU continues its upward trend towards the use of more alternative fuels.