



# Sustainability Leadership



*“Penn State will take every step possible to reduce emissions without unduly increasing our costs. In light of that commitment, I would like to share with the University community some of Penn State’s efforts.”*

“We are currently working on an overall energy master plan. The current environmental plan that the University has in place has us achieving a significant, double-digit reduction in greenhouse gas emissions by 2012. Our goals are aggressive, particularly given the continued growth of the campus, and will require support from the entire community.

The basis of the plan is as follows:

- Continue with our plan to purchase Renewable Energy Credits.**  
This in combination with the state’s mandated Renewable Energy Portfolio Standard will get our total renewable percentage to 22 percent by 2012 using funds already committed.
- Continue with our plan for an aggressive awareness campaign.**  
Approximately 30 percent of our energy usage is under the direct control of the building occupants. There are important steps that can be taken in offices and residence halls to reduce dramatically our energy consumption.
- Continue to partner with research units on new technologies**  
such as carbon sequestration, bio-digesters and solar collector design.
- Continue with our initiative to reduce overall petroleum consumption**  
by reducing our overall service fleet, converting our diesel vehicles to use bio-diesel (B20) and converting some of our service vehicles to alternative fuels.
- Continue with our Guaranteed Energy Savings Projects.”**



Excerpt from April 26, 2006 press release, *Statement from President Spanier regarding Penn State’s commitment to the environment*

Graham B. Spanier, President  
The Pennsylvania State University  
Wednesday, April 26, 2006  
<http://live.psu.edu/story/17519>



Photo: Pat Little/College of Agricultural Sciences



Photo: Greg Grieco



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## AWARDS/RECOGNITIONS

- 2009 EPA Sustainability Partners Program Inaugural Member
- PROP Recycling Award 2009
- Penn State was ranked 1st in the world by Elsevier Press, the world's largest scientific publisher, for leadership in multidisciplinary alternative energy research
- EPA Green Power Partnership 08-09
- Student Leadership and Service Ceremony 2009 recognized STATERs
- 2001 Penn Future Green Power Award
- APPA Effective and Innovative Practices Award 2004 for Trash to Treasure
- The Massachusetts-based Sustainable Endowments Institute named Penn State one of 25 campus sustainability leaders in North America
- Governors Award for Environmental Excellence for Recycling and Market Development
- New Wind Energy Leader Award Community Energy
- EPA, DOE and Center for Resource Solutions 2002 Green Power Leadership Award
- PA Waste Watcher Award 2003 Penn State United Way

## EDUCATION & RESEARCH

### Curricular



- Penn State offers students over 600 courses on environmental topics; 16 undergraduate majors in energy and environmental studies; 37 minors; and 6 graduate programs.

- Smeal College of Business has formed a corporate

advisory board consisting of sustainability executives from some of the world's leading corporations. The eight-member board is made up of representatives from Alcoa, Caterpillar, Dell, DuPont, Eastman Kodak, Johnson & Johnson, PepsiCo and Xerox. The Sustainability Council will advise the College on curriculum development, research possibilities and corporate partnership development.

- The Schreyer Institute for Teaching Excellence, in collaboration with the faculty and several campus institutes, has sponsored 5 teaching luncheons and a conference with over 100 attendees, discussing ways to weave sustainability into the curriculum.
- Through a grant from the National Science Foundation, the Center for Sustainability at Penn State is developing a rubric and assessment tool to help faculty integrate and implement sustainability into existing courses.
- A Penn State Mont Alto professor is leading an effort to integrate sustainability into the curriculum at our 19 campuses across Pennsylvania.
- The [Philadelphia Field Project](#) is a unique undergraduate public scholarship and service learning opportunity aimed at addressing the root causes of urban poverty and environmental justice issues. The field course

is offered by the Department of Geography in partnership with the Office of Educational Equity, College of Earth and Mineral Sciences, and Schreyer Honors College.

### Co-curricular

The [Center for Sustainability](#) has championed service learning programs that enrich students' educational experiences while strengthening communities locally and globally.

- In 2009, 24 students and volunteers design and build green housing projects on the Northern Cheyenne Reservation, as part of the ongoing American Indian Housing Initiative.
- The Honduran Solar Project, in which students installed solar arrays on a grade school
- Over 50 students have conducted energy audits of six local institutions and businesses, including a local school district and a beer brewery.
- Green Careers Project features an online virtual meeting place for students interested in green careers and sustainability-focused companies looking for qualified graduates.



Our **Solar Decathlon team** placed fourth in 2007 and in 2009 our next Solar Decathlon team, *Natural Fusion*, competed again with a team of 97 students including 16 project managers. The team finished third in the Engineering Contest and

fourth in Lighting among the 20 teams competing from around the world. To meet the Natural Fusion team and tour the house go to: [www.solar.psu.edu](http://www.solar.psu.edu)

The **Division of Student Affairs** has included sustainability in their student learning outcome goals which state that students will «Develop a deep understanding of sustainability (locally, nationally, globally) and be prepared to lead others in the implementation of strategies for sustainable resource use on campus and in their communities.» [See the learning outcomes](#)

Penn State is **home to 12 environmental student groups**: Eco-Action, Sustainability Coalition, Environmental Society, Sustainable Agriculture Club, Engineers for a Sustainable World, STATERs (students who lead recycling at football games), Community Food Security Club, Shaver's Creek Student Network Outreach Team, Net Impact (MBAs interested in social entrepreneurship), Vegetarian Club, Earth House (on-campus sustainable housing), and Houseasaurus (off-campus sustainable housing).

**PSU's Physical Plant (OPP) collaborates with students and faculty**, providing them with practical applications of their studies. Examples include:

- The nationally-recognized STATERs's program in which students hand out recycling bags to tailgaters, has resulted in a 400% increase in

recycling and compost capture at home football games and has raised more than \$65,000 for the United Way. In the last two football seasons (2008 & 2009), the STATERs recycled 190 tons of football waste and raised in excess of \$10,000 for the United Way while reducing post-game clean up costs by 15 percent.

- Environmental student groups have been involved in reviewing plans for reducing water bottle consumption, resulting in the installation of some water bottle filling stations. This could avoid over 12,800 plastic water bottle purchases annually.
- The Friday Night Lights Out student group turns off over 2,000 lights in classrooms every week.
- Green roofs — our 4 green roofs provide living labs for our faculty and students.
- Cooking oil to biofuels — All of University Park Residential Dining Commons' used cooking oil (about 10,000 gallons a year) is currently made into biodiesel by Lake Erie Biofuels. Penn State Farm Operations has plans to make our own biodiesel from University Park used cooking oil by 2011.
- Composting — OPP works with the College of Ag to capture over 3,000 tons of food and landscaping waste and convert it into 1,200 tons of compost at our [OMPEC composting facility](#).
- The Living Filter Program is a collaboration between the College of Agriculture, College of Earth and Mineral Science and the Office of Physical Plant where treated wastewater is sprayed over fields in order to circulate that water safely back to the water table.

### Research

Penn State is home to [over 50 research centers and institutes working on various kinds of sustainability issues](#) involving a wide variety of disciplines. Most of these are part of our Penn State Institutes of Energy and the Environment.

### [Penn State Institutes of Energy and the Environment \(PSIEE\)](#) is the University's

internationally-recognized central coordinating structure for energy and environmental research, education, and outreach. Their latest annual report lists these accomplishments:

- Penn State continues to excel in research funding for environmental sciences. In 2000 Penn State was 25th nationally with \$20.4 million. In 2007 (the last year reported by NSF) we were ranked 11th nationally, with over \$55 million in annual research expenditures.
- The Department of Energy ranks Penn State 9th nationally in energy research funding, and our \$63 million in energy research funding in FY06-07 blossomed to \$87M in FY07-08.
- Elsevier Press, the world's largest scientific publisher ranked Penn State 5th among over 3,000 research institutions, and 1st among universities worldwide, for leadership in multidisciplinary alternative energy research.
- In FY08-09 the 44 current PSIEE co-funded faculty were principal or co-principal investigators on more than 400 successful grant

- proposals, with \$109,105,329 in awards.
- We are deepening our engagement with stakeholders across the Commonwealth. Just a few examples: the Pennsylvania Sea Grant program, hosted by Penn State Erie; the Clean Energy Application Center in the Philadelphia Navy Yard; the BioEnergy Bridge based in Pittsburgh; and an NSF-funded climate science educational partnership with the Whitaker Center for Science and the Arts in Harrisburg.

**Penn State's Transportation Institute** is one of 17 universities participating in the **EcoCAR: The Next Challenge** a multi-college competition sponsored by GM and the U.S. Department of Energy (DOE), organized and overseen by Argonne National Laboratory. The goal of the three year challenge is to design and build a working hybrid vehicle applying GM's standard engineering design methods and procedures. [EcoCar website](#)

## OPERATIONS

### Buildings

- Penn State has 12 existing buildings that have or will be LEED-certified and 6 more LEED buildings are under construction.
- **Penn State's Green Building Policy** states that all new buildings and major renovation projects will meet USGBC LEED building standards and be certified. The Policy establishes our own LEED rating system that exceeds the national standards. For example, all of our buildings must exceed ASHRAE 90.1 by 30%.
- The Penn State Behrend campus has converted two of its dorms to geothermal heating/cooling system in the last two years.

### Energy



- Since 2006, PSU's energy savings programs have reduced our GHG emissions by about 10% and electrical use by about 4%.

- Penn State offsets nearly 20% of its energy use with wind power and low-impact hydropower through the purchase of Renewable Energy Credits (RECs).

- The University has invested \$40 million in re-commissioning and retrofitting existing buildings which has resulted in \$4.5 million annually in avoided cost savings in energy.
- Computer power management: Big Fix, a power-management software, is expected to avoid more than \$500,000 in electrical costs for the University Park campus by automating the "deep sleep" function on personal and lab computers. Big Fix is also saving money in reduced labor costs for local and central IT since updates and patches can be done remotely.
- Desktop and Server virtualization programs are already saving the Office of Physical Plant's 1,300 employees over 475,000 kilowatt-hours annually.
- Our new 2009 Energy Conservation Policy sets behavior and technology standards for all

students and employees and aims to further reduce energy consumption by \$1.5 million annually.



- **Biodiesel:** We are growing canola and other oil seed crops, pressing the canola seeds and using the oil as fuel in two new tractors. We have been using biodiesel for 7 years and worked with New Holland utilizing B100. We are receiving all the used

cooking oil from campus food service and will be converting it to biodiesel. In the future we hope to grow canola, press the canola oil, use it for cooking, and then convert the used cooking oil into biodiesel to power the tractors that produce the crops.

### Climate

- Since 2005 a full-time staff person has maintained our [Greenhouse Gas Inventory Inventory](#)
- Penn State is achieving it's goal of 17.5% reduction in greenhouse gas emissions by 2012 (2005 baseline)

### Dining Services

- Java Catering, the University's catering service, practices sustainability by offering Zero Waste Event services, purchasing locally-sourced and manufactured foods and using biodegradable dining ware.
- Residential dining commons are composting pre-consumer kitchen waste, napkins, and using (and composting) biodegradable flatware, and reusing fryer grease to make biodiesel.

### Grounds

- Landscaping uses Integrated Pest Management to reduce chemical exposure and native species to reduce watering loads.
- Impervious Surface Elimination Project aims at maximizing the square footage of pervious surface and has already resulted in improved stormwater mitigation.

### Purchasing Initiatives

- Sustainability criteria (e.g. preference for recycled content, durability, energy efficiency, low toxicity, and recyclability) are being put into our standard contracts.
- 30% recycled content paper offered at a 5.8% *cost discount* compared to virgin paper.
- Developed a Ceiling Tile Recycling Program with Armstrong Corporation. Over 25 tons of ceiling tiles were diverted from the landfill in 2008. We then closed the waste loop by purchasing their recycled content products.
- Current initiatives include new RFPs for a janitorial paper supplier and a year-long cross-disciplinary effort to analyze the carpet industry, leading suppliers, and products for their adherence to the triple bottom line of financial, ecological and social impact.

### Transportation

- 28% of campus vans operate on compressed natural gas or flex-fuels.
- Office of Physical Plant uses seven Segways, three smart cars, and eleven electric vehicles and all diesel equipment and vehicles run on B20 (20% biodiesel) purchased from Amerigreen, a Pennsylvania-based company.
- Penn State has worked with the State College Borough to create a Bicycle Master Plan to support bicycle-commuting and on-campus mobility. We have a Bike Route Map that facilitates bicycling.
- The Ride for Five Program allows full-time employees to purchase a monthly bus pass for only \$5 a month (regularly \$49 a month). Over 700 employees are taking part which has helped to avoid the \$14 million dollar expense of two additional parking decks.



- Buses that service Centre County use compressed natural gas that results in fewer emissions than gasoline.

- Centre Area Transportation Authority (CATA) offers a Rideshare service to connect

people that live in similar areas to form carpools.

- For groups of 7-12 people living in the same area CATA offers a Vanpool Program.

### Waste Reduction

Penn State has a highly developed waste management program and is now recycling over 53% of its waste—about 7,000 tons—at a savings of over \$400,000 in avoided tipping fees annually.

- The **Penn State Department of Environmental Health and Safety** has many programs aimed at preventing pollution from its mercury reduction program to efforts aimed at the safe recycling of compact fluorescent light bulbs.
- Lion Surplus is a for-profit, university-based business that collects, sells, and disposes of all surplus University-owned equipment, supplies, and materials.
- Our **Trash to Treasure Program** captures unwanted items at student move-out dates, collecting 63 tons of goods that produced \$63,000 for United Way.
- We work with furniture and electronic suppliers to reduce packaging, such as our work with Dell, which saves \$23 per computer in addition to avoided labor costs.
- Penn State operates it's own composting facility **Organic Materials Processing and Education Center (OMPEC)** which annually generates 4,000 yards of mulch and 2,000 yards of compost from landscape waste (leaves, grass-clippings, woodchips), animal waste, and some food waste.
- Penn State contributes 90% of its bottom ash (~6,500 tons) from its coal-fired West Campus Steam Plant to a concrete manufacturer in York, Pennsylvania, which makes it into concrete block.

## Water

- Housing and Residence Life along with the Office of Physical Plant are purchasing energy and water efficient front-loading washing machines and installing low-flow heads on faucets and showers.
- The Living Filter Program is a collaboration between the College of Agriculture, College of Earth and Mineral Science and the Office of Physical Plant where nearly a billion gallons of treated wastewater is sprayed over 527 acres of fields in order to circulate that water safely back to the water table.
- The College of Education is leading an effort to reduce the use of bottled water and increase the use of local water and reusable bottles via panel discussions, awareness campaigns and the installation of “hydration stations”, water-bottle refilling stations.
- Our Stormwater Management Program promotes the use of conservation design practices to protect the watersheds at all campuses and it has identified over 500 acres of Water Resource Preservation Areas at University Park which are incorporated into the Campus Master Plan.

## Green Cleaning

- Office of Physical Plant's Custodial Service unit has adopted its own [Blue Cleaning Program](#) that sets standards for, tests and utilizes green cleaning supplies in campus buildings.

## AWARENESS & CULTURE

- Our Take Charge energy and environmental awareness program reaches 15,000 students annually.
- The Campus Sustainability Office is creating a Penn State Green Team Network. Green Teams are groups of faculty and staff who meet regularly to “green” their work space and building(s). Currently 18 Green Teams are active at these locations:

University Park Campus Green Teams:

- » Student Health Center
- » Outreach
- » HUB Robeson Center
- » University Libraries
- » Housing
- » USBII
- » Dining Services
- » Central IT
- » College of Education (3ECO group)
- » College of Engineering (Center for Sustainability)
- » School of Architecture and Landscape Architecture
- » Penn Stater Conference Center

Commonwealth Campuses Green Teams:

- » Harrisburg
  - » Berks
  - » Behrend
  - » Altoona
  - » Mont Alto
  - » Brandywine
- The Campus Sustainability Office is creating a Student Eco-Rep Program. Modeled on similar programs at other leading “green” universities, the Eco-Rep program will consist of a network of trained, paid student sustainability educators, “eco-reps”, that live in residence halls and do programming for their peers—and also serve as a grassroots network for the dissemination of sustainability news, events, and actions.

## PLANNING & ADMINISTRATION



In line with its goal to be a leader in environmental stewardship, PSU created an administrative infrastructure to act as a rudder, guiding measureable sustainable practices throughout our campuses. In light of this objective:

- Sustainability is part of the University's new Strategic Plan and President Spanier established a goal of a 17.5% reduction of GHG emissions by 2012.
- A Sustainability Leadership Council coordinates operations, research, outreach and academic efforts on sustainability.
- The Finance and Business (F&B) Environmental Stewardship Key Initiatives Team, representing administrators and operations staff from various divisions, established 8 sustainability goals. To help implement these goals, Finance & Business created the Campus Sustainability Office and dedicated funding for cost-effective sustainability projects.

## Human Resources

- The Campus Sustainability Office is working with the Office of Human Resources on a number of initiatives most notably the *Leading the Green Challenge Conference* to be held in March 2010. With 300 - 400 attendees this first annual event is aimed at providing basic technical knowledge and green leadership skills to staff and faculty so they can take effective action to improve the sustainability of the institution.

- Other Human Resources initiatives in planning include on-going training modules, integration of sustainability into New Employee Orientation and the inclusion of sustainability in the Staff Review and Development Program (SRDP), our performance review process.

## Investment

Penn State's endowment has investments in various private capital funds that include strategies with allocations to clean technology and green initiatives.

## PUBLIC ENGAGEMENT & OUTREACH

Through its nationally-recognized [Outreach Division](#), Penn State is engaging millions of citizens, organizations, and communities on sustainability challenges and opportunities in many ways, including:

- [Cooperative Extension's energy program](#) is aggregating and trading energy credits on behalf of small entities, assisting energy company incubations, partnering on community scale alternative and renewable energy projects, offering 4-H youth programs in energy and environment, and assisting communities to balance agriculture and energy production with environment interests.
- The [World Campus](#) program has approximately 10,000 students in 62 countries and is offering some sustainability-related courses, such as Earth Science Education, in a distance-learning format.
- The Penn State Center in the greater Pittsburgh area, addresses green workforce development, sustainable building infrastructure, emerging renewable energy credit markets, energy business incubation, and brownfield redevelopment.
- [PennTAP](#) and [Small Business Development Center](#) provide free consultation assistance to small businesses, including consulting on energy efficiency, waste reduction, pollution prevention and regulatory compliance.
- The Center for Sustainability, PSU Broadcasting, PSIEE, and the Economic and Workforce Development are working together to offer a package of energy efficiency and renewable energy education programs and services in response to Pennsylvania's Act 129 - mandating utility companies to reduce carbon emissions.
- [Public Broadcasting](#) has developed a suite of video materials associated with sustainability topics, including green buildings, water infrastructure, energy efficiency, energy assets, and K-12 curriculum resources.

This brochure highlights sustainability activities at The Pennsylvania State University, but does not attempt to include all sustainability initiatives. All data was researched by the Campus Sustainability Office from sources on campus.



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