

Contact: Patrice Sayre/Diana Gonzalez

SUI SUSTAINABILITY ANNUAL REPORT

The University of Iowa is pleased to report on sustainability accomplishments over the past year.

Planning and Development

Vision: Each institution will demonstrate a commitment to sustainability in its campus master plan, incorporating environmental stewardship.

Goals:

1. **LEED Certification:** All major projects (new buildings and major capital renovations) initiated after April 1, 2009 shall meet or exceed the U.S. Green Building Council's guidelines for silver level LEED certification.

- Currently, the UI has 10 projects that have or will be seeking at least LEED Silver designation:

Beckwith Boathouse	College of Public Health
Iowa Institute for Biomedical Discovery	State Hygienic Laboratory
Old Music Building	Hancher Auditorium Complex
Data Center	Carver-Hawkeye Arena Addition
Institute for Orthopaedics, Sports Medicine and Rehabilitation	

In addition, the UI and UI Foundation will be seeking LEED EB-O&M certification for the University Services Building and the Levitt Center.

On campus are sixteen LEED-certified professionals.

2. **Design Professional Services Selection:** For all major capital projects initiated after April 1, 2009, preference shall be given to design professionals with LEED certification experience.
 - This preference is stated in all UI professional design services selection criteria and all firms hired have proven experience with LEED projects.
3. **ASHRAE Energy Standards:** All new building and major capital renovation projects that alter mechanical and electrical systems shall exceed the current American Society of Heating, Refrigerating & Air Conditioning Engineers (ASHRAE) 90.1 requirements, which provides minimum requirements for energy efficient design of buildings.
 - This requirement has been included in new building and renovation specifications.
4. **Energy Efficient Lighting and Lighting Systems:** The design of new lighting and lighting control systems shall comply with the latest version of the American Society of Heating, Refrigerating & Air Conditioning Engineers/Illumination Engineering Society of North America (ASHRAE/IESNA) 90.1, Energy-Efficient Design of New Buildings Except Low-Rise Residential. The Lighting quality and light uniformity shall comply with Illuminating Engineering Society of North America (IESNA) Standard, Current Edition.
 - These requirements have been included in new building and renovation specifications.

5. **Electronic Business Solutions:** All campuses shall encourage electronic business solutions to reduce the demand for paper and travel, such as electronic systems and teleconferencing.

- The UI has incorporated electronic solutions in many areas including solicitations for goods and services, e-printing of most admissions-related items (including the university catalog, now only available on-line), payroll and travel items, and other administrative notifications. Employees have a paperless option for most notifications, including tax forms. Teleconferencing is being used more widely as services are available. Inter-institutional efforts are progressing to allow for electronic bidding for most contracts.

Purchasing

Vision: Each institution shall adopt a campus-wide environmentally preferable purchasing plan that is consistent with best practices in higher education. These policies will increase the purchase of products with a reduced environmental impact, while balancing the purchase decision with fiscal responsibilities.

Goals:

1. **Energy Efficiency:** Institutions shall specify U.S. EPA Energy Star* equivalent or better ratings on applicable energy consuming products when available and practicable. When Energy Star labels are not available, all purchasing units shall choose products that are energy efficient.

- The UI specifies Energy Star* or better in specifications for the purchase of energy-consuming products.

2. **Source Reduction**

○ Institutions shall purchase products with a minimum of 30% Post Consumer Waste (PCW) recycled content for paper products, or, at the minimum, EPA standard for other products, or bio-based materials, when available and practicable.

- Office paper is 30% post consumer or higher content with the exception of specialty papers ordered upon request where recycled content may vary.
- Rough paper (paper towels, toilet paper) are 100% recycled content.

○ Institutions shall encourage vendor packaging that is reusable, contains a minimum of hazardous and non-recyclable materials, and meets or exceeds the recycled material content levels in the U.S. EPA Comprehensive Procurement Guidelines for Paperboard and Packaging.

- These preferences are included in most bid solicitations, as is a preference for waste reductive packaging.

○ Reduce the use of disposable products. Specify and purchase products that are reusable or refillable wherever feasible and practical.

- The UI Office of Sustainability is evaluating the prevalence of single-use items across the campus, especially in the dining areas. Styrofoam clamshell take-away containers have been eliminated on the main campus and

biodegradable containers and utensils are used exclusively. Single-use items are more common in public health and hospital settings. These items are often composed of multi-layered materials, sealed for safety and security and pose a special challenge in waste reduction and recycling.

- By July 1, 2012, the Regent institutions' combined purchases with recycled content will increase by 10% over the base year of FY 2010.
 - The University of Iowa purchases goods with recycled content when possible. The UI currently tracks, to the extent possible, recycled content material purchases. The recent implementation of Ebuy, which hosts 14 vendor catalogs, allows for the ability to track purchases that are considered "green." Tracking purchases with recycled content is a hurdle that is complicated by vendors' inability to provide data in a common format. Thus, tracking purchases today is still very manual. The University continues to look for ways to improve how these purchases are tracked.
- 3. **Buy Local:** Institutions shall encourage purchase of locally grown and produced products, defined as within Iowa or a 500 mile radius of the institution, to minimize the environmental costs associated with shipping.
 - An increased amount of goods procured by the UI are coming from local producers, especially food products for dining services. Recently, the UI co-sponsored a local foods conference with the City of Iowa City to bring local decision-makers together to learn more about the availability of local food products. The Iowa Memorial Union dining services director has made a special commitment to including local foods in dining and catering. In addition to including produce from the new student garden in IMU menu offerings, the amount of local foods (within about a 500 mile radius) purchased for catering and dining has increased to around 52% (based on dollars spent).
- 4. **Green Goods and Services:** Institutions shall encourage the use of green-certified products and services such as, but not limited to, Green Seal, Egologo, EPEAT (Electronic Product Environmental Assessment Tool), FSC, etc.
 - Whenever feasible, UI includes a preference for green certified products in bid solicitations. For example, the UI recently accepted bids for green cleaning training and products that required the use of Green Seal or the equivalent for cleaning products.
- 5. **E-procurement:**
 - Institutions shall strive to achieve paperless processes by reducing the use of paper, toner, storage files and space.
 - The University of Iowa implemented another module to our e-procurement suite of products – Ebuy, which hosts 14 vendor master agreements, making the ordering from University contracts easier and more accurate. Eleven of the 14 vendors are also enabled with a "ghost" procurement card for electronic payment, eliminating the need to receive paper invoices from our vendors. Also see discussion of UI progress towards adopting electronic business solutions, including e-procurement processes (Goal 5, Planning & Development).

- By January 1, 2010, institutions shall require all bidders for goods and services (excluding construction) to:
 - submit bids/proposals electronically or, at a minimum, on recycled paper, double-sided and without extra materials not requested
 - reduce packaging or minimize the negative impact of packaging
 - consider the environmental and social impact costs over the lifetime of a product or services in evaluation criteria.
- ✓ These criteria are now required by UI purchasers. The University of Iowa has been using an electronic bidding system since May 2008 (<http://www.uiowa.edu/~purchase/purchase/eBidLogin.htm>).

Energy and Climate

Vision: Institutions shall commit to pursuing climate neutral operations through energy efficiency, conservation, on-site generation and strategic procurement of clean and renewable energy.

Goals:

1. **Metering:** By July 1, 2013, 90 percent of the utilities (steam, condensate, electricity, potable water and chilled water) systems shall be metered at the point of consumption to measure effectively use and waste in the system.
 - All main campus buildings have utility meters and controls to measure and monitor consumption of steam, chilled water, condensate, potable water and electricity. The new Energy Control Center allows real-time monitoring of energy usage to enable the rapid detection and resolution of problems causing excessive energy consumption.
2. **Energy Portfolio:**
 - By July 1, 2013, the combined energy portfolio of the Regent institutions shall include at least 10% from renewable sources.
 - The University of Iowa continues to expand its renewable portfolio to include the use of biomass, solar, landfill gas and wind, to support achieving the inter-institutional goal of 10% by 2013.
 - By 2025, the Regent institutions shall meet the Culver/Judge Energy Legislation Initiative for a renewable standard of 25%.
(http://www.governor.iowa.gov/news/2008/01/15_1.php)
 - No report at this time.
 - The Regent institutions shall establish individual goals to enable the collective success toward the use of renewable energy. As part of this, the institutions will also develop and act on individual plans for energy reduction, energy efficiency and energy conservation goals.
 - The University of Iowa has adopted energy conservation and renewable energies goals consisted with the Culver/Judge legislation: <http://www.facilities.uiowa.edu/uem/energy-management/EnergyPlanFeb2007.pdf>. We are presently assessing more aggressive energy conservation and renewable goals.

- The Regent institutions shall achieve reductions in Greenhouse Gas (GHG) emissions consistent with the strategies developed by the Iowa Climate Change Advisory Council created under Iowa Code § 455B.851 in 2007.
 - The UI reports annual carbon dioxide emissions reductions from its central power plant on campus. The oat hulls co-combustion biomass project and other efficiencies introduced at the UI Power Plant and elsewhere around campus have resulted in a reduction in 61,200 tons of CO₂ emissions. Those figures are publicly reported: <http://www.facilities.uiowa.edu/uem/energy-management/UICO2Emissions98to08.pdf>

The UI is an active participant in the City of Iowa City's greenhouse gas emissions reduction planning effort. In preparation for this effort, the UI is undertaking a complete greenhouse gas inventory for the campus.

Materials and Recycling

Vision: Regent institutions shall reduce the volume of materials and resources consumed, and reuse or recycle resources and materials whenever possible, with the long-term objective of contributing to the development of a waste-free society.

Goals:

1. **Recycling:** Encourage and promote programs that reuse, repurpose or recycle surplus items such as lamps/light bulbs, toxic waste, batteries, paper, bottles, and other products where feasible and practicable.
 - The University of Iowa has a recycling program for many items and has had a surplus program for many years.
2. **Conserving:** Select the duplex setting as the default for printers and copiers, and use recycled toner whenever possible.
 - Duplex printing is the default for most new printers and copiers. Departments are encouraged to recycle toner cartridges whenever possible and most use a mail-back program.
3. **Materials:**
 - Recycle electronic waste in a responsible manner.
 - The UI recycles and reuses electronic waste through its surplus store and by using a responsible vendor.
 - Encourage institutions to continue to identify strategies and programs to mitigate waste.
 - Facilities Management is phasing in a new program for campus waste management that will change the way trash, recycling and confidential waste are handled in buildings. The program has several components including reducing trash, expanding recycling and reducing the costs of our waste management program. Starting July 1, 2010, there will be a transition to one-time per month desk-side trash collection by custodial staff and eliminate custodial staff collection of desk-side recycling.
To encourage increased recycling, educational support for recycling will be increased and steps will be taken to provide ease and convenience of recycling to students, faculty, staff members and visiting guests.

Transportation

Vision: Regent institutions shall develop transportation strategies that increase fuel efficiency and reduce fuel use, air pollution and carbon dioxide emissions while providing opportunities for alternative transportation including bicycle and pedestrian infrastructure.

Goals:

1. **Emissions:** Regent institutions shall reduce the emissions related to the campus fleet through:

- o Increasing E85 and biodiesel alternate fuels while increasing the percentage of Flex Fuel, hybrid and electric vehicles in each fleet.

- E-85 use on the UI campus rose from 126,673 gallons in FY2008 (14.6% of total gallons) to 151,371 gallons in FY 09 (22.4% of total gallons). As the use of E-85 has increased, the use of E-10 has fallen from 302,250 gallons in FY2003 (47% of total gallons) to 270,673 in FY2009 (40% of total gallons).

The biodiesel ratio used in diesel fuel for CAMBUS (37 transit buses) will also rise from the 1-5% ratio that has been in use since FY2004, to 20% (B-20 formulation) in FY2011. The installation of newer engines that support the use of B-20 in their warranties and the recent ability to store the fleet indoors (lower temperatures can gel higher ratios of biodiesel) will allow the use of the higher ratio.

The biodiesel ratio used in all other (non-CAMBUS) UI-owned transportation (34 trucks in FY2009) and non-transportation diesel engines, except emergency generators, will rise from the 1-5% ratio to a 10% ratio (B-10) in FY2011.

E-85, hybrids and fully electric vehicles now constitute 47.4% of the total UI Fleet Services Fleet (264/557) compared to 35.8% in FY2005 (178/497). In FY2011 those numbers are projected to rise to 52.4% of the Fleet Services (285/544).

- o Increasing the number of passenger miles traveled (number of passengers times the miles traveled) in university fleet vehicles, relative to total fleet mileage.
 - The UI van pool program operates 81 vans supporting 796 riders. At 70% occupancy levels for daily ridership, the operation of the van pool program increases passenger miles traveled and reduces vehicle miles traveled by over nine million miles annually, reducing potential carbon dioxide emissions by approximately 3,200 metric tons.
 - In FY 2009 CAMBUS carried 4,000,000 rides at an average trip length of 1.1 miles. Total CAMBUS mileage was 806,251.
- o Reducing the number of vehicles used for transportation of employees and guests to/from airports.
 - There are currently several private transportation services available to employees between the campus and the airport and between their homes and the airport.
- o Initiating discussions with Risk Management personnel to resolve Worker's Compensation issues to allow Regents' fleet vehicles to transport other state, county, municipal, and governmental staff and officials on coordinated travel.

- The UI risk management staff is currently exploring this question.
- Increasing efforts to reduce vehicle idling.
 - Fleet Services ran a test program last year by installing several GPS monitoring devices in a few vehicles. This program was ended and FS will begin a new and expanded program, installing up to 30 GPS devices on a wider array of vehicle types. This new test utilizes a more robust technology. One of the goals of this trial is to begin to monitor engine idling times.
- 2. **Alternative Transportation:** Regent institutions shall strive to reduce the number of single occupant vehicles coming to campus through:
 - Creating new or expanding programs or partnerships with municipalities and local bus, van pool and ride share systems to provide alternatives to commuting alone.
 - The University of Iowa operates one of the largest public transit systems in Iowa. The CAMBUS program is free to anyone. CAMBUS also offers a free on-demand service, the Bionic Bus, for those who need special assistance.
 - UI Parking and Transportation also offers discounted bus passes on the two other local community transit systems; Iowa City Transit and Coralville Transit. The three transit systems combined, often have the highest ridership of any city in the State of Iowa. In FY 2009 CAMBUS ridership exceeded 4,000,000, while Iowa City and Coralville transit systems combined for a total of 2,520,057 *additional* rides. About 37% of that ridership on the Iowa City/Coralville systems represents University of Iowa employees and students who are participating in the UI commuter program that offers discounted bus passes for individuals using public transit. These commuter numbers are trending upwards. For instance, FY2004 Iowa City/Coralville transit ridership was 1,844,641. About 30%, or 552,405, of the ridership were participants in the UI bus pass program.
 - The number of participants is also growing. In December of 2009 (FY 10) 2,240 students were enrolled in the bus pass program along with 1,614 employees for a total of 3,854. These numbers were up from December of 2004 (FY 05) when 1,406 students were participating as were 1,239 employees for a total of 2,654. The high point was December of 2008 when 4,035 were enrolled.
 - The University also operates vanpools and various three-person and two-person car pool programs. A March 2006 survey indicated that 12.2% of employees use car pools to commute to work; 5.6% use van pools.
 - The parking system also provides significant financial support for bicycle parking racks on campus. Recent surveys of utilization of on-campus bicycle parking racks indicate the following:
 - 1993 = 2,088 bikes parked on campus (base data)
 - 2007 = 2,194 (an increase of 106 or 5% from 1993)
 - 2008 = 2,447 (an increase of 253 or 12% from 2007)
 - 2009 = 2,225 (a decrease of 222 or -9% from 2008)
 - Increasing parking system controls or incentives to encourage alternatives and achieve reductions in the number of single passenger commuter vehicles.

- Employees and students are charged to park on campus. UI Parking and Transportation also funds substantial discounts for the use of transit, van pools and car pools in order to reduce demand for parking on campus.
- Nearly 7,000 peripheral parking spaces are available around campus with direct CAMBUS service linking the parking lots with central campus destinations. Much of that service offers five minute headways during peak demand times and maintains a minimum of fifteen minute headways during mid day and early evening.
- Expanding the use of teleconferences, video conferencing, and interactive webinars with geographically distant individuals
 - Real-time collaboration at the UI uses the Internet to communicate with participants as if they were in the same room. Real-time collaboration involves several kinds of synchronous communication tools such as: instant messaging, group chat, whiteboard collaboration, application sharing, desktop sharing, co-browsing, voice-over IP and video and audio conferencing tools. The UI offers the following services, with support from UI Information Technology Services:
 - H.323 Internet-Based Video Conferencing - The University of Iowa supports Internet video conferencing solutions that follow the International Telecommunications Union H.323 Internet-based multimedia communications systems standard.
 - Web Conferencing - Virtual Classrooms and Meetings - Support is provided for Internet-based meetings, classrooms, and virtual office hours. Moderator-led interactions are possible from any location using a computer and an Internet connection.
 - Access Grid - The Access Grid is used to support group-to-group interactions across the Grid computing middleware (or computational grids) and visualization environments.
- Coordinating travel of employees attending the same event.
 - Car- and van-pooling are encouraged and supported through Parking and Transportation.
- Encouraging walking and biking by enhancing safe walking paths, bike lanes, and other bicycle programs such as bike storage.
 - Bicycling on campus is supported by funding biking programs and the installation and upgrading of bicycle parking spaces. Most UI students (and faculty and staff) live off-campus and biking is an affordable and easy means of transportation around campus and Iowa City. University officials coordinated in the update of the metro bike plan (<http://www.jccog.org/documents/bikePlan.pdf>) to enhance biking opportunities and safety around town.
 - The University of Iowa Office of Sustainability, the City of Iowa City Bike Library, the UI Parking and Transportation Department and Facilities Management Department have been working with students to design a bike share program. Students prepared a grant request to Wellmark to establish the bike share program. The grant was not funded, but Wellmark officials encouraged students to re-apply this spring. The Earth Day "Bike To School" event will be held again this year to help promote biking as an alternative and sustainable means of transportation.

- Exploring work alternatives and alternative scheduling that meets the needs of the institution.
 - Remote log-in computer connection is now available to UI employees, allowing telecommuting when approved by supervisors.

Water and Landscape

Vision: Regent institutions shall pursue water saving and efficiency measures, including collection technologies and re-use mechanisms.

Goals:

1. **Irrigation Water Consumption:** Regents institutions will adopt best management practices for minimizing irrigation and for the use of graywater for this purpose.
 - Irrigation is already extremely limited on campus. The UI employs an irrigation system that includes a moisture sensor so that water is applied only when soil moisture levels indicate a need.
2. **Organic Campus:** Regents institutions will use Organic Materials Review Institute (OMRI) listed pesticides and fertilizers on campus.
 - The University currently is investigating organic alternatives.
3. **Stormwater Management:** Regents institutions will adopt best management practices for stormwater on campus.
 - The new College of Public Health Building will feature sustainable site design that includes the establishment of a rain garden on the east (river) side of the site, the restoration of natural tall-grass prairie on the north side of the building, the use of no-mow lawn mix in other areas and a prairie grasses and native white oaks on the south side of the site.

Sustainability in the Curriculum

Public Universities

Vision: Regent institutions will pursue a sustainable future through the curriculum by:

- Providing educational opportunities for students to facilitate their acquisition of the knowledge, skills, and collaborative work ethic necessary to engage effectively in public discourse and policy debate and in other hands-on problem-solving in matters relating to environmental, social, and economic sustainability;
- Providing educational programs that prepare students for sustainability-related careers (e.g. in wind power and other green industries, biobased energy and other biobased products, governmental organizations, international economic or policy organizations, non-governmental organizations, farmers, researchers, engineers, writers, or teachers);
- Providing opportunities for students to participate in sustainability-related research, the “greening” of campus infrastructure, civic engagement, and internships;
- Exposing students to ideas and issues related to a sustainable, balanced, and ethical future for the planet and its inhabitants, including (1) the dynamics of biological population growth and decline in the natural world, predator-prey models,

overexploitation of natural resources, and energy balances; (2) how human behavior affects the natural world and the ability of earth to sustain life; and (3) the stochastic interplay of human and natural factors in determining the long-run population growth path for human and non-human species; and

- Helping students understand how to make informed rational decisions as consumers, workers, resource owners, and citizens electing government officials by taking into account the effects of human actions on human welfare in this and future generations.
- Helping students think in terms of economic, social, political, and environmental sustainability, as well as environmental health.

Goals:

1. Increase efforts to recruit high school students, as well as professional and graduate students, who are seeking an education in sustainability at an institution that practices sustainability.
 - At *Next Step Iowa* receptions in Iowa, Illinois and Minnesota, University of Iowa officials shared information about SUI's sustainability efforts with potential undergraduate students. The UI Office of Sustainability will be providing information regarding sustainability efforts on campus for articles in *My College Guide*, a national publication targeting high-ability sophomores in high school.
 - The University of Iowa website (which is frequently consulted by potential students) includes information on sustainability in many locations. See, e.g., (www.sustainability.uiowa.edu).
 - SUI admission business has moved online via e-mails and a web-based Admissions Profile. The Admissions office has also reduced the volume of paper materials printed and mailed.
 - The University of Iowa was selected for inclusion in "The Princeton Review's Guide to 286 Green Colleges." This is the first college guidebook for high school students that focuses exclusively on identifying colleges and universities that have demonstrated an above average commitment to sustainability and our listing in the guidebook will help us attract students from all over the country who are interested in sustainability issues.
2. Increase the sustainability experiences for freshmen through first-year seminars, core general education requirements, or living/learning communities.
 - Over 100 first-year seminars were made available to incoming students during the 2009-2010 academic year, several of which were about sustainability or sustainability-related issues (e.g. climate change).
 - A new living/learning community on sustainability will be available to students beginning Fall 2010.
3. Make sustainability a part of all orientation programs on campus.
 - Sustainability information displays and staff are available at both new student and new faculty orientation.

4. Form curriculum workshops to engage and assist faculty and teaching assistants in integrating sustainability into general education and, as appropriate, undergraduate and graduate programs.
 - No action at this time.
5. Continue to participate in national efforts to understand and promote sustainability education, such as the National Teach-in Day for Climate Change and Sustainability, the workshop on sustainability education sponsored by the Association for Advancement of Sustainability in Higher Education, and the Consortium on the place of sustainability in Global Learning Leadership sponsored by the Association of American Colleges and Universities.
 - SUI has actively participated in the National Teach-In Day for the past two years. This year, the SUI Office of Sustainability, SUI faculty member Dave Bennett, and the National Teach-In Association organized a state-wide conference call, including all Iowa colleges and universities who wish to participate, to pose questions to policy staff in Senator Harkin's and Senator Grassley's offices regarding climate change legislation.
6. Increase the curricular offerings in sustainability to undergraduates through majors, minors, certificates, internships, service learning, and living/learning communities.
 - SUI recently created an undergraduate Certificate in Sustainability.
 - Various undergraduate majors focus on sustainability to some extent or another and new sustainability-related courses are developed every year. Undergraduate programs with especially strong sustainability components include civil & environmental engineering, environmental sciences, geography, and mechanical engineering.
 - A new Sustainability Living/Learning Community has been established and will be open to incoming students in Fall 2010.
 - The Department of Geography has announced a new sustainability track and the Department of Urban and Regional Planning (Graduate College) offers a similar emphasis on sustainability (second-year students worked on sustainability plans for several eastern Iowa communities). The School of Art and Art History has embraced sustainability by encouraging the use of sustainable materials in design and print-making.
7. Continue to support incorporating sustainability in the curriculum and in faculty research.
 - SUI's many centers and programs for sustainability-related research, scholarship and artistic creation include:
 - ⇒ Center for Global and Regional Environmental Research promotes interdisciplinary efforts that focus on global environmental change.
 - ⇒ Center for Health Effects of Environmental Contamination.
 - ⇒ Center for International Rural and Environmental Health, facilitating international cooperation to address increasingly globalized health priorities.
 - ⇒ College of Engineering is committed to providing the engineers, ideas, and solutions needed to create a more sustainable world.
 - ⇒ International Programs offers opportunities for international learning.
 - ⇒ Public Policy Center provides policymakers with information that can make our lives and communities thrive in sustainable ways through academic research.

- SUI recently authorized ten faculty positions to perform interdisciplinary teaching and research at the intersection of sustainability and water resources in the areas of Geography, Civil and Environmental Engineering, Chemistry, Urban and Regional Planning and Law.
8. Encourage departments to offer interdisciplinary courses related to sustainability.
 - Many of the courses that address issues of sustainability are cross-listed (interdisciplinary) courses.
 9. Offer courses that address specific issues related to sustainability, including encouraging students to be knowledgeable and responsible citizens and preparing students to pursue sustainable practices in their professions. Topics that can be addressed are environmental restoration and preservation, LEED construction practices, efficient operation and control of mechanical and power systems, alternative power sources, and sustainability incorporated in the design of human environments.
 - More than 150 courses in sustainability-related topics are offered to graduate and undergraduate students at the University of Iowa. Many of the courses are project-centered.
 10. Sponsor Town Hall meetings on campus to discuss curricular efforts related to sustainability.
 - No action at this time.
 11. Create sustainability enhancements for graduate and professional degree students through certificates, internships, or research partnered with green industry, government agencies, or non-government organizations.
 - There are dozens of graduate and professional degree programs at Iowa, and students in those programs have hundreds of opportunities to engage in internships and partnered research, many of which will involve sustainability-related work. Some notable examples of internships or research involving partnerships between SUI and external constituents are identified below.
 - The College of Engineering offers a Wind Power Management Focus Area to graduate students in its Industrial Engineering program. The goal is to prepare graduates for employment in the growing wind energy industry in Iowa and elsewhere. The College also provides a variety of opportunities for graduate students in the College to pursue sustainability-related internships and research work in wind energy and other areas.
 - ✓ For example, a graduate student in the college was recently selected as Director of Education and Projects with the Engineers for a Sustainable World (ESW) National Office. In this volunteer internship position, the student (with the guidance of a UI professor) will develop sustainability education modules/training for dissemination to ESW chapters around the U.S.
 - ✓ Through a grant from the Iowa Office of Energy Independence, the College will also be funding 10-15 summer internships (for undergraduate and graduate students) at Iowa-based wind energy companies.
 - ✓ Currently, several engineering graduate students are engaged in research and/or internships with Iowa companies or organizations. Those students are working on projects aimed at improving the performance of

wind turbines; developing techniques for reducing energy use by heating, ventilation, and air-conditioning facilities; and developing models to predict water quality in Iowa rivers under different land-use scenarios.

- In 2009 and 2010, students from the UI College of Law had internships with the US Environmental Protection Agency, the environmental law section of the Iowa Attorney General's Office, the Iowa Department of Natural Resources, and Plains Justice (a Cedar Rapids-based non-profit focused on sustainability).
 - The SUI Office of Sustainability also offers a variety of internships and volunteer opportunities so that students (including graduate and professional students) can learn the practical and applied side of sustainability, including the importance of communications and community relations. Through its website and Facebook page, the Office of Sustainability also promotes internship opportunities with non-profit organizations, such as Sierra Club, AASHE and I-RENEW, and with governmental organizations, such as Iowa Department of Natural Resources.
 - The SUI Facilities Management department also offers internships to students to conduct work on the biomass project at the main power plant, energy engineering and conservation projects, and in the new energy control center. Student interns are working on sustainability-related research in many areas, such as the Hydrosociences Lab, the Center for Global and Regional Environmental Research, the Institute for Rural Environmental Health, and through cooperative ventures in many green industries and ventures.
12. Increase opportunities for sustainability education through stand-alone certificates for returning students, certificates through distance education, or cooperative agreements with community colleges.
- The University of Iowa recognizes and accepts some classes offered by Kirkwood Community College as credit toward the requirements of the SUI undergraduate certificate in sustainability studies.

Sustainability in Economic Development/Research/Outreach:

Vision: To pursue a sustainable future through economic research development and outreach by:

- Becoming a world leader in research related to the strengths of the three public universities.
- Helping Iowa businesses understand challenges and opportunities of a carbon-limited world.
- Developing and improving alternative energy sources.
- Serving as models and consultants to local, state, regional, national, and international industries, governments, and communities in issues related to sustainability.
- Developing public policy and practices for sustainable agriculture, community education for a sustainable lifestyle, sustainable tourism, solutions to problems of solid waste, reduction of pollution in metal casting, bioremediation of hydrocarbon contaminated soils, understanding ground water and surface water contamination, use of embedded sensors and software for systems control, use of geographic

information systems to assess water quality and ecological damage, environmental threats to public health, and multimedia to communicate findings of sustainability research to the public.

Goals:

1. Expand external funding of sustainability research.
 - Recently funding has been obtained to support research into flood prediction, global climate change impacts, optimizing biomass energy production, improving battery function, and pollution control and mitigation, just to name a few areas.
 - Many research institutes, such as the Center for Global and Regional Environmental Research, the Institute for Rural Environmental Health, Center for Health Effects of Environmental Contamination, the UI Hygienic Laboratory, the Bioventures Center, the Center for International Rural and Environmental Health, the Environmental Health Sciences Research Center, the Public Policy Center, the IHR--Hydroscience & Engineering, the Iowa Flood Center, the Center for Biocatalysis and Bioprocessing, and the Nanoscience and Nanotechnology Institute are centers for investigations in sustainability. Researchers affiliated with these centers regularly seek and obtain external funding to support their efforts.
 - The UI, Iowa State University and University of Northern Iowa are collaborating on a major proposal to the National Science Foundation's Office of Experimental Program to Stimulate Competitive Research (EPSCoR) for \$20,000,000 (over 5 years) to "build research capacity within the state to support a transition in energy supply from mining subsurface (fossil) energy stores to harnessing renewable energy flows at or near the earth's surface." This research proposal is organized into four platforms – bioenergy, wind energy, solar energy and energy efficiency – each of which comprised of three or more research planks. Focused research activities will be conducted by interdisciplinary teams of faculty from the Regent Universities that will interact with Iowa's community colleges, private colleges, state agencies and businesses.
2. Continue to work with other educational leaders at all levels and leaders in the private sector to develop a statewide science and technology plan to reposition Iowa for workforce development and to capitalize on the unique strengths of each of the three public universities.
 - The EPSCoR project discussed earlier will support a "Broader Impacts Program" that includes workforce development as a core objective. This part of the project will focus on attracting students in the science, technology, engineering and mathematics (STEM) fields through improved science and math instruction in K-12 education; the development of college curricula related to renewable energies, and the promotion of partnerships with industry aimed at understanding and responding to growing workforce needs in renewable energies development.
3. Sponsor seminars for industries in wind energy, biofuels, solar and other renewable energies, biobased energy, and other biobased products.
 - The **Iowa Alliance for Wind Innovation and Novel Development** builds linkages with state and local governments, the community colleges, Regent universities, the private sector, associations and community organizations, and the federal government. This state-wide effort coordinates activities in research and education, and catalyzes activities designed to meet the research, training,

- and testing needs of the expanding wind energy industry. <http://www.iawind.org>. IAWIND hosts an annual conference on wind energy issues.
- October 16-17, 2009: the University of Iowa sponsored a two-day symposium on “Energy and Climate Change in the Midwest: Creating Opportunities in the New Economy.” This two-day symposium provided a forum for dialogue about new energy opportunities being created in response to the growing challenge of climate change. The event featured national experts from an array of backgrounds and attracted participants from across Iowa.
4. Work with students and businesses to exploit opportunities made available by the promotion of sustainability.
 - The Iowa College of Engineering (which has a strong focus on sustainability issues, particularly in its wind energy program and its environmental engineering program) has created an “Immediate Corporate Partner Assistance” program to offer prompt assistance to businesses seeking the identify College of Engineering resources that can assist businesses in developing opportunities in the sustainability area and others. In addition, the College offers a wide range of programs aimed at strengthening business develop alliances between the college and the business community. www.engineering/uiowa.edu/economic-partners/partnership-list.php
 - The John Pappajohn Entrepreneurial Center (JPEC) at the university is a collaboration among four university colleges aimed at delivering education, training, and outreach programs to students, faculty, aspiring entrepreneurs and business owners throughout the state of Iowa. The program’s overall goal is to assist people in successfully developing their business ideas. It is not restricted to assisting those with ideas related to sustainability, but one recent participant won the Merle Volding Business Plan Competition for his plan to launch a business installing renewable energy equipment at Iowa homes and businesses.
 5. Conduct an ongoing series of high profile workshops on sustainability, available to the public, including major international conferences on renewable energy and water resources.
 - See item 3, above, regarding the “Energy and Climate Change in the Midwest” symposium, offered in October 2009.
 6. Exploit the creative resources of the Internet to share the vision, knowledge, and practices and to invite engagement in these challenging issues of the 21st century.
 - The EPSCoR project, as described above, will include web-based support and sharing of information. Specifically, cyberinfrastructure activities will provide a virtual interface among research platforms and a cyber portal for renewable energy science and engineering will support data repositories for science platforms, data analysis resources, and education portals into renewable energies.
 - The University of Iowa Office of Sustainability has developed a website to inform the public about the full range of sustainability efforts at the university. The University of Iowa Office of Sustainability also uses Twitter, Facebook, and RSS feeds to communicate with the public about sustainability and the university.
 - Iowa Research Online, a publicly accessible database of research at the

University of Iowa, can be easily searched to find research and information relating to sustainability.

7. Assist in the implementation of sustainable practices by firms and government agencies, including the identification of cost-effective environmentally-friendly processes that are economically sustainable to generate a normal rate of profit.
 - University of Iowa students participate in the Iowa Department of Natural Resources' Pollution Prevention Program. This internship program offers a unique partnership of academia, industry and government all working together toward environmental and economic goals. Interns gain first-hand experience in their career discipline, as they integrate pollution prevention methodologies into core business practices such as six sigma and lean manufacturing, zero waste, EMS and quality management programs to create tangible economic benefits for their host company.
8. Develop new methods of analysis for evaluating the sustainability of alternative natural and built environments within different economic systems.
 - Several activities undertaken at the University of Iowa are addressing sustainability needs in communities. Students in the University of Iowa Graduate Program in Urban and Regional Planning are bringing sustainability to small-town Iowa through an educational outreach project. Twenty-eight students in the yearlong field problems in planning class are developing sustainability plans for four Eastern Iowa towns: Anamosa, Columbus Junction, Decorah and Wellman. These second-year master's degree students will serve as consultants to city administrators in the towns, working with them to address each community's respective needs in the areas of economics, the environment, equity and energy.
 - At the University of Iowa College of Law, the Housing Project is a clinical law community economic development and assistive technology project that helps expand housing opportunities for persons with disabilities and other residents. The Housing Project has assisted persons with disabilities and their families to obtain and pay for much-needed modifications and retrofits to their homes through workshops held throughout the state.
9. Develop and transfer new technologies that conserve energy, matter, and, in particular, water, air, minerals, and other natural resources.
 - Iowa faculty, graduate students, and facilities professionals are actively engaged in research aimed at developing or improving technologies for energy production or environmental protection. Most of this research is transferred to industry and the general public through publication of research results. A sample of the wide variety of research efforts in these areas can be found through a search at Iowa Research Online. One example is a recent dissertation by an Iowa Ph.D. student on the combustion properties of oil sand derived bitumen-in-water emulsions. Another recent thesis, by an Iowa M.S. student, focuses on mitigating wind turbine vibrations through wind turbine control technology in order to reduce the negative impact such vibrations have on wind turbine performance. Finally, a team of researchers from the Iowa Institute of Hydraulic Research has been instrumental in developing fish-passage technology for hydroelectric dams in the Pacific Northwest. This technology increases the survival rate of salmon that must pass the dams in both directions, and thus contributes significantly to preservation of this important fishery resource.

10. Sustain and create industries that drive the world's economic engines to improve the quality of life.
 - No action at this time.
11. Continue to develop and grow programs that are directed at sustainability for the nation and the developing world.
 - See discussion of sustainability in the curriculum.
12. Provide public education to increase energy and resource conservation and the recycling and reuse of material.
 - See Item 8.
13. Develop public education to reduce soil erosion and overuse of chemicals and fertilizers in agriculture, and to increase energy efficiency on farms.
 - No action at this time.