

**THE UNIVERSITY OF KANSAS  
2009 SUSTAINABILITY REPORT  
TO THE KANSAS BOARD OF REGENTS**

In October 2008, the Kansas Board of Regents adopted the following Policy Statement on Sustainability:

*University policies, practices and programs should, whenever possible, embody approaches that reduce life cycle costs, restore or maintain the functioning of natural systems, and enhance human well-being.*

*For purposes of this policy provision, sustainability shall mean societal efforts to meet the needs of present users without compromising the ability of future generations to meet their own needs. Sustainability presumes that the planet's resources are finite, and should be used conservatively, wisely and equitably. Decisions and investments aimed to promote sustainability will simultaneously advance economic vitality, ecological integrity and social welfare.*

This report describes what the University of Kansas is doing to address each of the six implementation principles along with additional information on sustainability research . Because this is the first opportunity to report on sustainability, initiatives and practices that predate the adoption of the policy statement have been included to establish a baseline for future annual reports.

**LEARNING OPPORTUNITIES:**

*State universities shall incorporate issues of sustainability in to the learning experiences of students throughout their academic experiences*

The University of Kansas has opportunities for students to learn about issues of sustainability throughout the curriculum. Over 230 sustainability-related classes, defined by the Association for the Advancement of Higher Education as courses that “help build knowledge about a component of sustainability or briefly introduce students to sustainability concepts” are offered at KU (<http://www.sustainability.ku.edu/courses.shtml>). During the 2007-2008 academic year, 22,350 credit hours were generated in 25 different academic departments in courses that met this definition.

More specific opportunities for learning exist within the Environmental Studies Program. Established in 1971, this interdisciplinary program brings together instruction from Ecology and Evolutionary Biology, Geography, History, the Kansas Biological Survey and Political Science to train students how to approach problems from a holistic viewpoint and provide the technical skills and background for active participation in an environmental career.

The Environmental Studies Program is also the academic home of KU's Integrative Graduate Education, Research and Traineeship (IGERT) Program on Climate Change. Funded by the National Science Foundation, the C-CHANGE program creates collaborative classroom and field research experiences to examine the human and natural causes and consequences of climate change. As with the Environmental Studies Program, C-CHANGE is an interdisciplinary program with faculty from Environmental Studies, Sociology, Geography, and Ecology & Evolutionary at KU, and American Indian Studies at Haskell Indian Nations University. Fellows in the program also come from diverse backgrounds, including various disciplines within the social and natural sciences and engineering.

During the 2008-2009 academic year, the KU Center for Sustainability coordinated a working group sponsored by the Center for Teaching Excellence to discuss strategies for expanding opportunities for sustainability education in the general curriculum. The group explored the possibility of developing a certificate program or introductory course that would approach sustainability from a range of disciplines. A prototype course is being taught through the Honors Program in fall 2009 with a focus on campus sustainability. The working group will be evaluating the course at its conclusion and providing recommendations for future steps.

The Center for Sustainability also provides support for independent study and volunteer projects that contribute to learning about sustainability. Examples include:

- an independent study course that conducted a sustainability assessment of a local music festival
- an introductory greenhouse gas inventory project that resulted in the collection of some useable data and served as a reference for additional GHG
- a grant writing exercise centered on a project to promote sustainable behaviors on campus
- a senior thesis on local government participation in the Cool Cities climate protection initiative

#### **CAMPUS LIFE:**

*State universities shall strive to infuse sustainability principles into the organization of campus life. This includes encouraging students, faculty and staff to:*

- *Minimize their environmental impact,*
- *Enhance campus ecology,*
- *Develop and foster awareness and campus culture that recognizes the importance of sustainability principles,*
- *Enhance/facilitate access to environmental and ecological goods, and*
- *Carry these lifestyles with them when they leave the campus community.*

The Center for Sustainability has a mission to promote “a culture of sustainability on the KU campus”, which includes encouraging integration of sustainability concepts into education, research, operations, and student life. The Center relies heavily on volunteer efforts from faculty and staff as well as collaboration with student organizations to carry out this message through education and outreach.

One key component to this effort is the Sustainability Ambassador Program, a network of faculty, staff and students that serve as liaisons to their respective department or organizations. The Sustainability Ambassador Program creates opportunities for peer-to-peer education and for generating new ideas, establishing partnerships, and sharing information about sustainable research and practices with the campus community. The ambassador program has established 4 major working groups focusing on: education & outreach, green procurement, student involvement, and technology.

A number of student organizations focus on sustainability, including umbrella organizations with a broad interest in sustainability and cause-based organizations that focus on a particular issues such as social justice or wind energy. These organizations have worked together with campus departments to host educational events and activities promoting sustainability such as Campus Sustainability Day, the KU Energy Fair, and various events surrounding Earth Day. Student organizations also instill the values of sustainability through individual events, activities, and campaigns. Additional information about these student organizations is found at

[http://www.sustainability.ku.edu/student\\_organizations.shtml](http://www.sustainability.ku.edu/student_organizations.shtml).

In 2009, a brochure on sustainability was distributed at New Student Orientation events and a new section on sustainability was included in the official orientation guide (with a more comprehensive guide on the website at <http://www.sustainability.ku.edu/orientation.shtml>). New Student Orientation and the KU Center for Sustainability also coordinated a sustainability-themed event during HAWK week (the first week of classes) with opportunities to meet representatives of student sustainability organizations and campus departments that focus on issues of sustainability.

The Center for Sustainability has also partnered with KU Facilities Operations, the KU Energy Council, and Chevron Energy Solutions to develop a website focused on energy conservation (<http://www.energy.ku.edu>). This site provides tips for energy conservation, links to relevant energy and environmental policies, and provides annual data on campus energy use. It also lists conservation measures taken through the current performance contract.

A number of efforts are underway to enhance campus ecology. In 2007, students involved in an independent study examining campus storm water runoff proposed the idea of building rain gardens on campus grounds. This led to a partnership with Design & Construction Management, the Center for Sustainability, and Recreation Services through which students designed a rain garden that collects water from the roof of the Ambler Student Recreation Fitness Center. The 5,000 square foot garden uses native species to slow runoff and allow for infiltration, minimizing the need for irrigation. In 2008, students worked with the Kansas Biological Survey to assess the condition of Potter Lake, a campus icon, and provide cost-effective, sustainable, and historically compatible restorative actions to improve the lake. Now known as the "Potter Lake Project" this group has collaborated with KBS, KU Design & Construction Management, and other campus departments and volunteers to remove several tons of vegetation and improve oxygen levels in the lake.

Coverage in the student newspaper, *The University Daily Kansas*, and the campus newsletter, *The Oread*, evidence the growing culture of sustainability. In spring 2009, the *UDK* frequently ran environmentally-themed articles on the cover. The paper has also had a staff member devoted to writing about environmental and social issues. A complete listing of coverage can be found at <http://www.sustainability.ku.edu/media.shtml>.

#### **OPERATIONS:**

*State universities shall comply with all relevant environmental laws and regulations and executive orders from the Governor, and aspire to go beyond compliance by integrating values of sustainability, stewardship, and resource conservation into activities and services. As operational decisions are made, university personnel should consider ways to improve the long-term quality and regenerative capacity of the environmental, social and economic system that support the institutional activities and needs and promote practices that minimize harmful effects of operations on the surrounding environment. State universities shall strive to maximize the efficiencies of operations and services while pursuing the goals detailed above within the resources available to institutions as they pursue excellence in fulfilling institutional missions.*

The University of Kansas should be well positioned when new rules and regulations regarding energy efficiency are adopted as required by the Renewable Energy Standards Act and Various Other Energy-Related Provisions. Rules and regulations adopted within the next year will require the average fuel efficiency for state-owned vehicles purchased during 2011 to be 10 percent higher than the fuel efficiency of vehicles purchased in 2008 if such purchases would be life-cycle cost-effective.

The University has already adopted an Energy Policy that includes purchasing guidelines for appliances, lighting fixtures and bulbs, and computers that are as energy efficient as similar products that qualify for the Energy Star program. The KU Energy Policy also provides guidelines for reducing energy use in existing facilities. This includes maximum temperature settings during the heating season of 69°F when occupied and 55°F when unoccupied, and minimum temperature settings during the cooling season of 76° when occupied and 85°F when unoccupied. The policy highlights the importance of monitoring energy use and educating faculty, staff, and students about utility costs and user impacts on energy consumption.

The University has conducted energy audits on a number of buildings as part of the ESCO Program and is using performance contracting as a means of addressing energy use. In November 2001, KU established a performance contract with Chevron Energy Solutions. Under the agreement, Chevron installed \$18.3 million of energy and water conservation measures, with financing for the investment paid through guaranteed savings in utilities. Projects completed in June 2004 include:

- Replaced 20,000 light fixtures throughout campus. In most cases, fixtures with 4 40-watt lamps each were replaced with fixtures containing 2 32-watt lamps and more efficient ballasts. Reflectors were also added for improved lighting.
- Replaced major heating and cooling equipment with more efficient systems and improved existing efficiency and operation of systems that were not replaced.
- Upgraded and expanded the existing Building Automation and Control System (BACS).
- Installed new underground piping to connect Malott, Wescoe and Summerfield to the Chiller Plant, improving cooling efficiency for those facilities.
- Upgraded the main electrical distribution on campus for enhanced reliability and efficiency.
- Installed solar film on windows in some buildings to reduce solar load.
- Installed over 70 programmable thermostats to allow building temperatures to be set back.

Since completion of the original contracted items, Chevron has upgraded lighting in the Robinson Recreation Center gymnasiums and racquetball courts to include more efficient fixtures and added occupancy sensors and timers to turn lights off over unoccupied courts. These improvements have resulted in an annual reduction of nearly 12,551 metric tons of carbon dioxide. Additional performance contracts with other energy service companies are being explored to further reduce energy use, particularly in energy intensive research facilities.

Facilities Operations provides recycling services for most academic and administrative buildings, and on-campus residential facilities. The recycling program currently employs 12 students, 1 full-time Program Manager, and 3 full-time University Support Staff. Recycling staff currently collect office paper, newspaper, aluminum cans, steel cans, #1 PETE plastic bottles, #2 plastic bottles, and cardboard. Recyclable materials are transported to a central accumulation site where they are sorted and baled. In FY 2009, over 640 tons of material, including scrap metal, were recycled on campus. The program also conducts special collections for surplus property including furniture and office equipment, and provides bins for collection of clothing, bedding, small appliances and household items at the student residence halls at the end of each academic year. The recycling program has been successful enough to allow the University of Kansas to reduce the number of scheduled trash pickups at six buildings.

The University also provides services that promote alternative transportation, meeting the requirements of both the Campus Life and Operations. KU on Wheels provides transit services to surrounding areas, as well as a shuttle between the main campus and the Park and Ride facility on

west campus. A recent collaboration with the City of Lawrence Transit System has extended that service by creating a coordinated system. KU Students, Faculty, and Staff are able to show their current KU Card and board any Lawrence Transit or KU on Wheels bus fare free. KU buses are currently operating on a 5% blend of biodiesel.

The Sustainability Ambassador program discussed above is also working to promote sustainable practices in the workplace. One goal of the Procurement Working Group is to increase the use of recycled content paper. A recent study of campus paper use concluded that only 6.5% of the copy paper purchased by departments at the University of Kansas between July through December 2008 was either 30%, 50% or 100% recycled content. Between January and June 2009 those purchases increased to 17%. This is still below the goal established by KSA 75-3740b, which requires that 25% of paper purchased by state agencies have at least 50% post-consumer recycled content. During the summer of 2009 the Procurement Working Group worked with the Purchasing office to negotiate a lower price for 30% recycled content paper to make this option more attractive.

Additional measures are being taken by University affiliates to improve efficiency and implement green initiatives in campus operations. For example, the Dept. of Student Housing has installed efficient water fixtures, is purchasing green certified cleaning products and paper products certified by the Forest Stewardship Council, and has installed geothermal heat pumps that condition two of twelve scholarship halls. The Memorial Unions uses a specialized reservation system that is linked to the heating and cooling system to automatically control the indoor climate based on occupancy. They use recycled paper towels and have installed censored water faucets and soap dispensers to help reduce waste. They also use Envirox, a mixture of hydrogen peroxide and citrus oil, for most cleaning tasks in the two buildings they operate. KU Dining Services is purchasing some local foods, organic foods and Fair Trade Certified Coffee and have planted an herb garden on the rooftop of the Kansas Union. Dining Services encourages the use of reusable dishware and offers discounts for refilling reusable mugs. They have experimented with tray-less dining to reduce food waste. And, Recreation Services, among other efforts to embrace sustainability, has retrofitted 15 elliptical machines with ReRev devices that reroute the energy created by workouts back into the building's electric system.

Finally, students have adopted a "Renewable Energy and Sustainability Fee" that is dedicated to sustainability initiatives. In FY 2009, the fee was used to purchase the ReRev system at the Ambler Recreation Fitness Center, insulating blankets for steam lines in three buildings, and wind energy credits to offset the fossil fuel used to power the Anschutz Library. The fee is part of the Campus Environmental Improvement Fee. Since the fee was first introduced by referendum in 1996, it has experienced strong support from students and received nearly 90% approval in the 2007 student election when the sustainability component was added.

### **CAMPUS PLANNING:**

*State universities recognize that sustainable design is a means to reduce energy consumption; enhance the health, well-being and productivity of the building occupants; and improve the quality of the natural environment. All of these can contribute to high-performing university buildings with lower life cycle costs. Accordingly, the state universities shall evaluate the impact of their construction projects; incorporate green building and design methods to the extent economically feasible; and consider the impact of planning decisions on future generations of the campus community, with the goal of minimizing the environmental footprint.*

In 2007, the University of Kansas set an efficiency target of 30% above the minimum guidelines established by the *ASHRAE Standard 90.1 - 2004 Energy Efficient Design of New Buildings Except Low Rise*

*Residential Buildings* for energy efficiency in new construction. The new standard has been applied to the new School of Pharmacy building; current models indicate a 31% energy savings over standard practices. The standard will also be applied to a building being designed for the Edwards Campus. Additionally, construction will begin on a new office building on the Medical Center campus this fall that is expected to qualify for LEED silver certification.

The KU Energy Policy encourages the use of energy life-cycle analyses and suggests that alternative energy sources, day lighting, and other strategies for reducing energy use should be considered. The Lighting section of the policy encourages the use of efficient lighting and day lighting, and discourages incandescent and decorative lighting.

To reduce the environmental impacts associated with construction, efforts are being made to recycle materials from project sites. KU Recycling provides cardboard recycling services for major renovation projects in order to divert waste associated with new fixtures and furnishing and population of the building. Scrap metal, asphalt, and concrete are also recycled from construction projects completed by Facilities Operations.

Major classroom buildings have been located with consideration of the ten-minute class hour change so that students have time to walk between classes. Traffic control booths are located at the entrances to the central campus to control and restrict traffic in that area. During the restricted hours, generally from 7:45 a.m. to 5 p.m. Monday through Friday, only busses and other vehicles authorized by assigned permit or by a courtesy pass may enter the campus. This creates a pedestrian-friendly campus and promotes the use of sustainable modes of transportation on the central campus.

Finally, funding from the Getty Foundation allowed for the completion of a Campus Heritage plan in 2008. The plan will aid in the preservation of culturally significant buildings, features, and landscapes of the Lawrence campus.

#### **ADMINISTRATION:**

*State universities shall develop sustainability goals that will inform institutional policies and procedures. These policies and procedures will rely on scientific and technical analysis, informed by economic realities of funding, to support efforts to develop objectives and targets for operations with indicators, or measures to assure accountability to the Board. Whenever economically feasible, sustainability will be included in areas of planning, decision-making, assessment, and reporting.*

In February 2007, the University of Kansas established the Center for Sustainability. This department, which reports to the Vice Provost for Scholarly Support, is the result of a Provost-Appointed Task force charged with examining “the feasibility and efficacy of organizing an expanded hub at KU for research, data collection and implementation of various actions that will make existing campus operations more friendly to the environment and to guide future campus growth in environmentally responsible directions.” The Center for Sustainability currently is staffed by one full-time director, one part-time analyst (60%), one part-time faculty (8.33%), and one part-time graduate research assistant.

The administration established five performance goals for the Center to work toward during the initial stages of development:

1. Secure externally funded research grants
2. Facilitate student-based sustainability research projects
3. Facilitate development of service-learning courses with a sustainability focus

4. Establish a campus-wide sustainability ambassador network to include faculty, staff, and student representation
5. Complete research that identifies cost-savings opportunities in campus operations

The Center is on target to meet the specific metrics established for each of these goals by February 2010, with the exception of directly securing externally funded research. However, that goal is being achieved by the University through sustainability research that is being pursued by a number of academic departments and designated research centers.

Outside of the Center for Sustainability, the University employs an Energy Programs Manager, Recycling Manager, and University Support Staff that oversee baling operations and surplus furniture collection and redistribution, and an Assistant Director overseeing transit. These positions contribute to the more sustainable operations of the campus and aid in establishing goals for sustainability in key areas.

In spring 2009, a graduate course consisting of IGERT C-CHANGE Fellows and Urban Planning students completed a greenhouse gas inventory using the Clean Air Cool Planets emissions calculator. The inventory illustrates a rising trend in emissions, the largest percentage (51%) of which is attributed to purchased electricity. Another 24% can be attributed to transportation, including emissions from university-owned vehicles, sponsored travel, and commuting by faculty, students and staff. The remaining emissions are connected to combustion of natural gas (13%) and a variety of other activities including paper use, refrigeration, and solid waste.

In response to their findings, the team drafted a proposal for a Climate Action Plan, which identifies broad opportunities for reducing GHG emissions while addressing educational, research, and financial concerns of the institution. A final draft of the proposal will be published in fall 2009 and could serve as a framework for establishing a reduction goal and specific strategies to meet that goal.

As noted above, KU has also adopted a campus Energy Policy, which suggests specific conservation measures for heating, cooling, water use, transportation, and recycling.

Student Success, a division that includes 20 departments and offices and employs more than 900 staff and 1700 student employees, has adopted a conservation policy that, among other measures, sets all printers to duplex (print on both sides of a page) by default and forces monitors to turn off and computers to go into "hibernate" mode after a short period of inactivity. The policy is projected to reduce energy use by nearly 403,000 kWh annually, resulting in a savings of more than \$29,000 and a reduction in carbon dioxide emissions of over 309 tons.

The next major step for the University of Kansas is to adopt an overarching set of sustainability goals to guide institutional planning, decision-making, assessment, and reporting. This opportunity to develop more centralized goals for sustainability would tie individual efforts together and set standards for the institution as a whole.

#### **OUTREACH:**

*State universities have various missions and roles with regard to their relationships with entities and individuals outside their respective boundaries. Engagement with sustainability in the various areas of university life will necessarily affect these relationships. State universities shall conscientiously share the knowledge, awareness,*

*and expertise generated by their engagement with sustainability in accordance with their respective missions and roles in serving society as a whole.*

Service learning courses are used for students to share knowledge and expertise with the broader community. Over the past 2 years, sustainability-focused service learning courses have been offered in Engineering, Environmental Studies, Journalism, Sociology, and Urban Planning. Additionally, the Center for Sustainability has worked with classes in Urban Planning, Engineering and Landscape Architecture that, while not registered with the program, provided services for community partners. KU students have contributed to community projects outside of the classroom including a design for a natural playground at a Lawrence park and an eco-friendly landscape design for a local business.

Research Centers at the University are involved in outreach efforts to share information about sustainability-related research with the general public and increase awareness:

*The Center for Environmentally Beneficial Catalysis (CEBC)* is disseminating the center's results to the general public through non-technical publications and mentoring science teachers and university faculty. The center provides hands-on experiences for students from grade school to high school as well as resources and opportunities for high school teachers, undergraduate students, graduate students and postdoctoral fellows.

*The Center for Remote Sensing of Ice Sheets (CRISIS)* is working to integrate polar science into the K-12 curriculum through presentations and workshops. Their educational outreach program allows students and teachers to follow the work of the scientists and access lesson plans and other resources. CRISIS supports enrichment programs for middle schools, particularly those with primarily minority enrollment, involving weekly activities, faculty visits, and electronic collaboration.

*KU Energy Council* conducts a variety of outreach at the state and national level as part of its mission. This outreach includes participation and exhibition at multiple state and national energy conferences. In addition the KU Energy Council host a number of short courses related to specific energy topics as well as an annual conference aimed at providing an overall research and development landscape for Kansans.

The University of Kansas has also worked directly with the City of Lawrence on sustainability initiatives. In 2008-2009, the Director of the KU Center for Sustainability and a faculty member from the School of Journalism served on the Mayor's Climate Protection Task Force, an appointed committee that submitted recommendations for reducing community greenhouse gas emissions. KU faculty, staff and students also serve on the city's Sustainability Advisory Board. Over the past few years, the Center for Sustainability has helped promote community-wide events and initiatives addressing issues of sustainability. The University of Kansas also participated in the Lawrence Energy Conservation Fair, sharing information about the KU Energy Council, a student design program focused on designing lower emission vehicles, and efforts to reduce energy use on campus.

#### **RESEARCH:**

Although research is not included as an implementation principle, the University of Kansas is contributing to the advancement of sustainability through sustainability-related research. In some cases, research is overlapping with campus operations. The Potter Lake project described above is one example of that intersection. Researchers and student volunteers are also currently transforming waste grease into transportation fuel. Used cooking oil from campus dining facilities is collected and

delivered to the KU Biodiesel Initiative's refining lab where it is refined, washed and tested, and transformed into pure biodiesel capable of powering conventional diesel engines. The lab's reactors can refine as much as 40 gallons of biodiesel every four days. Currently the fuel is being tested in FO Landscaping equipment, and tests using B5 fuel have been completed in campus buses, with additional plans for testing B20 fuel.

Other recent initiatives include:

- The KU Energy Council, comprised of researchers focusing on specific aspects of energy, has secured more than \$40 million in federal, state, and university funds over the past five years.
- The Center for Environmentally Beneficial Catalysis (CEBC) has leveraged more than \$24 million in federal, industrial, state, and university funds over the past five years to develop technologies for the chemicals and energy industries. These technologies, guided by sustainability assessments, aim to reduce waste generation, lower energy consumption, and enhance safety while remaining economically competitive.
- The Biodiesel Initiative, with its "Feedstock to Tailpipe" concept, brings together researcher in chemical, mechanical, and environmental engineering, ecology, biology and geography to make KU a pioneer in biofuels research.
- Researchers at CEBC and the KU Transportation Research Institute, along with K-State and industry leaders, have recently established the Kansas Biorefining/ Bioenergy Center of Innovation (KBBCI), which has been awarded \$4.1 million for FY10 from the Kansas Bioscience Authority. KBBCI seeks to spur commercialization of new technologies to sustainably convert Kansas biomass feedstocks into advanced biofuels and value-added chemicals.
- Kansas NSF EPSCoR (Experimental Program to Stimulate Competitive Research), a statewide program that includes the University of Kansas, was awarded \$20 million to research climate change and renewable energy. Researchers from the University of Kansas will explore new technologies for capturing solar energy, examine factors that influence what crops farmers decide to grow, and work with tribal college students to explore climate change and energy issues on Native American lands.