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Sustainability Success Story at UIC

The University of Illinois Chicago (UIC) was formed in 1982 by the consolidation of two U. of I. campuses: the Medical Center campus, which dates back to the 19th century, and the comprehensive Chicago Circle campus which replaced, in 1965, the two-year undergraduate Navy Pier campus that had opened in 1946 to educate returning veterans. The public research university operates 115 buildings in an urban setting and has a total budget of over 2 billion dollars per year.



↗ Shown above is the Student Residence Commons at UIC.



Pictured above is the University of Illinois Outpatient Care Clinic and Divvy Bike Station.

Faculty members and 7,938 Administrative, Professional & Support staff and you have a group of approximately 37,500 people. UIC is one of Chicago's 20 largest employers and has 15 colleges, including the nation's largest college of medicine. UIC also operates the state's major public medical center and regional health sciences campuses in Peoria, Rockford and Urbana-Champaign. An organization of that size definitely has a significant carbon footprint with many opportunities to impact our environment. UIC is one of the leading institutions of higher education in Chicago and aims to be a leader in sustainability in Chicago as well. They just achieved a Silver level ranking in the Association for Advancement of Sustainability in Higher Education (AASHE) Sustainability Tracking,

16,660 undergraduates, 8,186 grad-

uate students, and 2,743 professional stu-

population of 27,589 at UIC. Add 1,960

dents comprise the total student

Assessment and Rating System (STARS) which is a transparent, self-reporting framework for colleges and universities to measure their sustainability performance. Chancellor Paula Allen-Meares is a strong supporter of sustainability and UIC has many success stories of their sustainability efforts and accomplishments. The Chancellor's Committee on Sustainability and Energy issued a report in 2010 and featured as its primary recommendation the creation of a Student Green Fee which was approved by the Board of Trustees in 2011. The Student Green Fee is a \$3 semester based fee charged to all students that serves to improve the quality of campus operations, reduce UIC's environmental impact, and most importantly generates awareness about environmental issues by creating opportunities for students' involvement. It has allowed the completion of various sustainability projects on campus including the Heritage Garden, permeable pavers by the Student Services Building, and Off-Grid Bus Shelter. Below is a (partial) list of sustainability related accomplishments:



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- » A discount program for Divvy bikeshare, subsidized for students by the Green Fee
- » Full implementation of the UIC Recycling Program in all buildings on campus
- » Campus Electronic Recycling Program (for both university property and personal electronics)
- » Pharmaceutical Disposal Program
- » Collection of Food Scraps for composting from the Student Centers
- » Great Stuff Exchange (GSX)



- » Building Energy Metering Initiative – continue to install electronically-monitored meters throughout campus.
- » Campus Use of Renewable Energy from solar power generated at Lincoln and Douglas Halls
- » Continuation of the UIC Energy Master Plan/Utilities Master Plan
- » Increasing numbers of Sustainabilityrelated Events

"By design, sustainability factors into all of UIC's daily operations as well as our major projects," said UIC Chancellor Paula Allen-Meares. "That commitment is evident in our new Mile Square Health Center main location at Wood and Roosevelt. It's our third LEED-certified building and attained gold status."

Office of Sustainability

UIC was the first University in Chicago to create an Office of Sustainabil-

ity and has a Climate Action Plan in place that mirrors that of the City of Chicago's in many ways. The Office of Sustainability was founded in January 2008 and has been headed since its beginning by the Associate Chancellor for Sustainability, Cynthia Klein-Banai and supported by a team of staff, graduate assistants, interns, undergraduate recycling assistants, and volunteers.

"Our office forms the focal point for coordinating sustainability initiatives on campus by receiving information, tracking data, and assessing progress," says Klein-Banai. "This is accomplished through involvement in institutional and programmatic planning, information dissemination, program implementation, grant writing, reporting, and acting as a resource on sustainability in higher education."

The Office of Sustainability coordinates initiatives on campus that bring UIC towards greater social, economic, and environmental sustainability. Klein-Banai adds, "Our current initiatives are focused on improvements to campus-wide recy-





cling, active transportation options, grounds, energy efficiency- all are strategies in UIC's first Climate Action Plan. In addition, we are undergoing a sustainability strategic thinking and planning process. Through outreach, education, and partnerships, we are able to collect information, act as a resource to the UIC community, and help facilitate improvements to the campus that reduce our university's impacts on the environment (while also improving the educational atmosphere and our fiscal bottom line)."

Energy Policy, Initiatives & Projects

The University of Illinois at Chicago spends tens of millions of dollars a year on its utility bills for electricity, heating and cooling systems, and water. It is a high priority for the campus to reduce its energy consumption to reduce expenses in its operating budget for these items. UIC is also committed to reducing greenhouse gas emissions. Many of the recommendations of the Chancellor's Committee on Sustainability & Energy address energy





Shown here is University Hall at UIC - in foreground is the location of the geothermal well-field.





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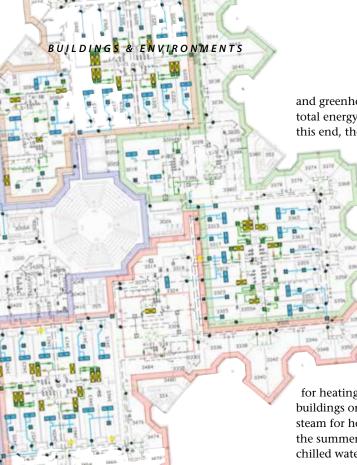
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and greenhouse gases including reducing total energy consumption by 20-40%. To this end, the campus has a number of on-

going energy conservation and energy efficiency projects including:

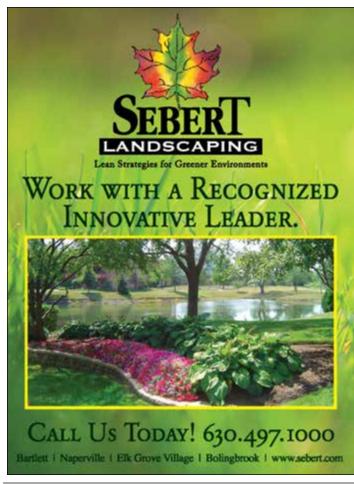
Metering Projects –
UIC's facilities management group and utilities operations has metered 29 campus buildings. The metering includes electricity, high-temperature hot water or steam, and chilled water. "Most buildings found on the east side of campus use

high-temperature hot water for heating in the cold months. Most buildings on the west side of campus use steam for heating in the cold months. In the summer, buildings are cooled by chilled water systems. The meters feed into a computer system that allows our building engineers and utilities to monitor

the energy consumption and detect unusual trends that could indicate problems with the systems in those buildings. This allows us to prioritize projects and locate "hot spots" for energy consumption. Also, by having this data, we have a baseline for evaluating energy projects," adds Klein-Banai.

The energy data provided by the meters is put into the Energy STAR Portfolio Manager by the Office of Sustainability for benchmarking. Benchmarking of building utilities is crucial in analyzing how energy projects have improved energy use and for developing new projects. Work is underway to meter and benchmark the rest of the buildings on campus, starting with those that are 250,000 square feet or more.

Energy Performance Contracting - Hiring an energy services company (ESCO) as a contractor to plan, finance, design and implement projects is an effective way to carry out large and expensive initiatives. "The ESCO project at UIC began retrofitting buildings in Fall 2013 and should finish all upgrades by early





2015, says Klein-Banai. The targeted buildings in the Science and Engineering Laboratories Complex (Science and Engineering Laboratory East, Science and Engineering Laboratory West, Science and Engineering South, Science and Engineering Offices, and Engineering Research Facility) have a combined square footage of 1,221,820 GSF, accounting for 17% of the square footage on the East Side of Campus and 8% of the total campus.

These buildings comprise UIC's four major laboratory facilities on the East Side of campus. All but one of the buildings were constructed in the mid-1960's and still retain their original mechanical systems, causing them to be the major consumers of energy on the East Side of campus. Their combined energy consumption in FY2013 was equivalent to 270 million kWh which makes up 1/3 of the energy use on the east side.

According to Klein-Banai, "this project will result in an overall savings of greater than 30% which is equivalent to the electricity to power 2,500 homes. It

will also reduce UIC's greenhouse gas emissions due to the operation of our buildings by 3.5% (the same as taking about 2,000 passenger vehicles off the road)." According to Ameresco, the energy management company contracting with UIC, the project will also create 592 direct jobs, 371 indirect jobs, and 314 induced jobs.

Shadow Billing - The metering project will allow the university to report energy consumption back to the colleges and administrative units that occupy space in UIC's buildings. This will heighten awareness of the real costs of energy utilization and reinforce efforts that we will be taking to promote conservation by students, faculty and staff. UIC plans to report this information on the Office of Sustainability website and signage in the buildings in the coming year.

Renewable Energy - There are three campus buildings that utilize renewable energy: Grant, Lincoln and Douglas Hall utilize a geothermal ground source heat pump system to reduce energy usage. It uses the relatively constant earth tempera-

ture to heat or cool water flowing through the building and into the well to draw or reject heat. Lincoln Hall has 224 solar panels and Douglas Hall has 244 solar panels that produce about 120 MWh/yr of electricity - which is equal to 2,120 tree seedlings grown for ten years.

Cogeneration - The ability of power plants to purchase fuel at a reduced cost created a unique arrangement for power generation at the University of Illinois. Utility Operations, an independent organization operating within the University, runs its own cogeneration plants on the UIC campus. Cogeneration is the simultaneous production of heat and power in a single thermodynamic process. Instead of discarding the heat produced by the power production process, it is captured and used to provide space heating and hot water heating, thus eliminating the added expense of burning fuels for the sole purpose of space heating. This plant runs primarily on natural gas which is cleaner than coal and fuel oil when considering hazardous air pollutants and carbon diox-





WHAT IS A SUSTAINABLE UNIVERSITY?

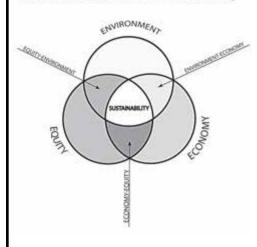
• ne definition of a sustainable university, is "a higher educational institution, that addresses, involves and promotes, on a regional or a global level, the minimization of negative environmental, economic, societal, and health

effects generated in the use of their resources in order to fulfill its functions of teaching, research, outreach and partnership, and stewardship in ways to help society make the transition to sustainable lifestyles."



The Three Domains of Sustainability





Sustainability is a holistic way of thinking about humans and the planet that can be manifested as a way of behaving at the individual, group, institutional, national, and global levels. The 1987 U.N. report "Our Common Future: The Report of the World Commission on Environment and Development" (often referred to as "The Brundtland Report") defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The report introduces a sustainability paradigm comprising three interdependent domains—environment, economy, and social equity—and makes clear that only a comprehensive approach encompassing all three domains assures that future generations not only survive, but flourish.

ide. When operated under certain conditions, cogeneration can be beneficial and helps lower the emission of carbon and sulfur dioxide pollutants into the air.

Lighting Upgrades – The UIC campus has many fluorescent light fixtures (the long bulbs). They began replacing these fixtures with more efficient ones with grants from the Illinois Clean Energy Community Foundation. Funding from Illinois Clean Energy totaled almost \$1M over the first four years while UIC

has contributed over \$1M of its own funds to these projects. In 2010 UIC began replacing even more fixtures with additional funding from the Illinois Department of Commerce and Economic Opportunity in cooperation with Com-Ed. UIC will be replacing T12 fluorescent lighting fixtures with high efficiency electronic ballasts and T8 lamps. To date, UIC has made replacements that save over 2,200,261 kWh per year (approximately \$110,000/yr).

HVAC Upgrades - Numerous projects are planned, in process and completed to improve HVAC systems across campus. These projects will improve the efficiency of the systems, provide better control of temperatures, and make those areas more comfortable for building occupants. One of the current projects is in the College of Dentistry which involved new updated building system controls, new air handlers, pumps with variable frequency drive, low flow fume hoods and lighting retrofits. Laboratories have higher air exchange rates to allow for adequate ventilation of potential chemical contaminants and thus a lot of energy is lost when that air is exhausted. Therefore, a heat recovery system is also being installed to capture the heat from the exhaust air. In addition, this is the first building at UIC to install the chilled beam technology which is a convection HVAC system that relies on the difference in air density of hot and cold air to create air movement.

Retrocommissioning - UIC has participated in the SEDAC Retrocommissioning program for several years. This program offers retro-commissioning guidance by identifying measures to improve the control, scheduling, and operation of energy consuming systems to match the current functional requirements of the building. The end result: significant energy and demand savings.

Building Envelope – UIC has completed numerous projects maintaining & restoring the building envelopes (i.e. walls, windows, foundations, doors, and roofs) of many of its buildings as it greatly affects how efficient a building will be in maintaining comfortable interior temperatures. Insulation in walls and seals around windows and doors are prime factors in this area and given special attention.

UIC also has used low-emittance coatings (microscopically thin, virtually invisible, metal or metallic oxide layers deposited on a window or skylight glazing surface primarily to reduce the U-factor by suppressing radiative heat flow), gas-fills, and insulating spacers and frames which can significantly reduce winter heat loss and summer heat gain through windows.

Details of the efforts and results in each of these energy efficiency areas can be found on the Office of Sustainability's website at www.sustainability.uic.edu.

In addition to various energy projects in these areas, UIC has established an energy policy and a series of goals to further reduce both wasteful energy consumption and harmful carbon emissions. The following policy was approved by Provost R. Michael Tanner and Mark Donovan, Vice Chancellor for Administrative Services, in November 2010.

UIC Energy Policy

The University of Illinois at Chicago is committed to sustainability in all aspects of its mission. It is important that faculty, staff and students make informed decisions to conserve energy, save money, and carry out its teaching, research, and service missions.

UIC seeks to vigorously improve efficiency in our operations which utilize non-renewable resources and contribute to the emission of greenhouse gases. UIC is a complex institution in the makeup of its buildings, operations and organization. Through implementation of this energy policy, the campus will reduce its environmental im-

pact, increase financial and social viability, and create a campus environment where energy efficiency and sustainability are evident. Energy compliance will be achieved by adhering to established guidelines, applicable codes, and standards.

Sustainability in Classrooms

There are many courses offered at UIC that include sustainability principles in the teachings. A number of courses focus on sustainability and require students to solve one or more major sustainability challenges. Other courses may focus on a topic other than sustainability, but incorporate a unit or module on sustainability or a sustainability challenge including an intensive workshop (one week or longer) with more sustainability-focused activities. Yet other classes integrate sustainability issues throughout the course. A full listing of classes featuring a sustainability component can be found on the Office of Sustainability website.

In addition, every summer the Energy Initiative offers a two-week intensive

workshop called the Summer Institute on Sustainability and Energy (SISE) that focuses on current topics in energy, sustainable energy, and sustainability. Participants converge at the University of Illinois at Chicago where they live and work together in a tight-knit, diverse community of energy-minded students and professionals. The SISE experience affords participants time and resources to explore pressing energy topics in an immersive environment. These future energy leaders are educated to make decisions about energy at the personal, civic, and global levels, in energy related fields including science, technology, entrepreneurship, economics, policy, planning, and behavior.

More Student Participation

Beyond making suggestions on how to spend the money collected from the student green fee, students are engaged insustainability in many ways at UIC. New this year is a "To Green and Beyond Toolkit' which features a Sustainability continued on page 28 »

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Sustainability Success Story at UIC

Map (indicating UIC Green Assets), "Proud to be Sustainable" poster campaign, "What Color is Your Sustainability"quiz, Sustainability Scavenger Hunt, and a "Show us Your Colors" public relations campaign in each building.

Another new initiative in 2014 is The Sustainability Internship Program (SIP) offered through the Office of Sustainability that offers hands-on learning experiences for undergraduates that advance the overall mission of greater social, economic and environmental sustainability in the campus community. This unique program provides an intellectual framework for students to apply classroom learning to project based engagement. The first 10 week program just com-

pleted this past summer and

consisted of SIP of internship placement at a UIC department. Weekly seminars with field outings that cover a range of educational and skill building topics, leadership development and project management experience. Seminar topics included: environmental and energy sustainability issues, cultural sustainability issues, institutional challenges and change management, campus structure and administration, campus sustainability programs and job readiness. This program is the result of various collaborations with: UIC Dining Services, UIC Campus Housing, Utilities, Facilities Man-

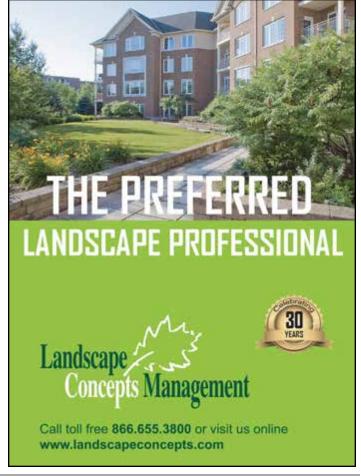
agement, Bike UIC, the College of Engineering, University of Illinois Hospital and the Energy Initiative.

UIC's "Sustainability Days" is a month-long celebration of sustainable living. In September, the Office of Sustainability hosts a variety of events throughout the month, as well as partners with and promotes other campus sustainability related events such as Calories to Kilowatt Competition, the Great Stuff Exchange, Campus Electronic Recycling, Open House Green Building Tours, Transportation Fair & Cycling Extravaganza, Memorial Grove Re-dedication, Weigh Your Waste, seminars on climate change and energy choices, and an environmentally educational film screening.

EcoReps

The Office of Sustainability coordinates many campus greening initiatives some related to recycling, active transportation, energy conservation, and the Tree Campus Program – that affect each department and unit on campus. To help







facilitate communication and implementation at the unit level, the Office of Sustainability has asked each department to designate a staff member to serve as a liaison – an EcoRep – to the Office of Sustainability. Klein-Banai concludes, "Sustainability is all around UIC–you just have to get out there and find it."

Green Town

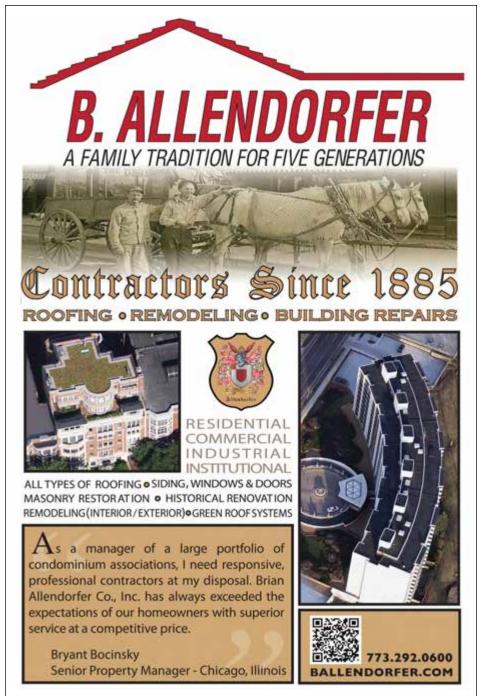
The University of Illinois Chicago has shown leadership in bringing together many people (other than students) from the community as well as businesses and other institutions in the name of sustainability. A good example of this is that UIC served as the site host for a GreenTown event on May 21 and 22 at the Student Center East, with key decision makers and community stakeholders meeting to help make sustainable communities a reality. GreenTown events are held at various locations and are co-produced by a5, and Seven Generations Ahead, a nonprofit organization with a mission to build healthy, sustainable communities.

This event at UIC was attended by residents, business leaders, elected officials and city managers, public works directors, park district directors, planners, developers, builders, architects, engineers, school leaders, teachers, healthcare professionals and environmental advocates. Attendees shared their interest in sustainable development, developed partnerships, heard inspiring speakers and learned from case studies. The intent of GreenTown is that these disparate groups go on to form partnerships and set goals and identified ac-

tionable steps they can take together to create sustainable communities.

The GreenTown event at UIC featured a special pre-conference session that highlighted the important role that colleges and universities play. In addition to training the next generation of sustainability leaders through academic programs, Institutions of Higher Education can advance sustainability throughout the Chicagoland region through community development efforts and infrastructure.

Representatives from Loyola University, Dominican University, the University of Illinois, Roosevelt University and Triton College joined attendees from other schools from around the region to discuss ways to engage college and university staff in the drive to sustainable change on campus and in the community, learn how to create learning opportunities related to engaging the broader community and to network with other community stakeholders.



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