UIC Climate Commitments
Aspirational Goals and Short-Term Action Items

Prepared by the UIC Office of Sustainability in conjunction with the Chancellor’s Committee on Sustainability and Energy (CCSE)
April 2016
1 Carbon Neutral Campus
UIC will strive to achieve carbon neutrality with net zero greenhouse gas (GHG) emissions through reducing and offsetting emissions related to operations and travel.

2 Zero Waste Campus
UIC defines zero waste as a 90% diversion rate of landfill-bound material through techniques such as source reduction, materials reuse, recycling, and composting.

3 Net Zero Water Campus
UIC will use the same amount of water in its operations (irrigation, plumbing, etc.) as the amount of natural rainfall on UIC’s campus.

4 Biodiverse Campus
UIC will create a resilient campus landscape supportive of a variety of life, such as plants, animals, and people.
A Letter from Chancellor Amiridis

Dear Students, Faculty, and Staff,

UIC has been at the forefront of the movement among the nation’s universities to actively reduce our energy footprint by being among the first signees of the American College & University Presidents’ Climate Commitment in 2007.

Once again taking the lead, UIC is among the first of a group of universities to sign Second Nature’s newly integrated Climate Commitment. This new level of commitment extends beyond our existing efforts to support carbon reduction, including a commitment to take steps toward making the Chicago region more resilient.

Through these climate commitments, UIC will actively engage in building a stronger sustainable work and living ethic while reducing campus emissions of greenhouse gases. We will strive to become a Climate Neutral, Zero Waste, Net Zero Water, and Biodiverse university. We are committed to sustainable practices that make our operations more efficient and conserve resources, serving as a model to our students and the community. UIC will work with the city of Chicago, other universities, and community partners to develop Chicago-specific scenarios and plans to mitigate and adapt to a changing world.

Every one of us has a part in meeting these goals through unit operations, research, and teaching. The Office of Sustainability is tasked with providing tools and expertise to help you in these efforts. The Chancellor’s Committee on Sustainability and Energy is tasked with updating our Climate Action Plan and creating a roadmap for implementation.

Thank you for your contribution to keep UIC at the forefront of the national university movement towards a sustainable future.

Sincerely,

Michael D. Amiridis
Chancellor
Introduction

The University of Illinois at Chicago (UIC) Climate Commitments further the 2009 UIC Climate Action Plan (CAP). This document supports the UIC Climate Commitments by connecting them to:

1. Aspirational goals that offer visionary solutions for the future.
2. Short-term action items that ensure progress over the next five years.
3. UIC’s existing accomplishments towards the UIC Climate Commitments.
4. A discussion on how teaching and learning on campus can support the institutional response to global climate change, and offer educational experiences that train students to address 21st century problems.

The UIC Climate Commitments offer a shared vision for the campus in meeting the challenges of climate change. While strategic planning must work within the current constraints (financial or otherwise), it must also set a compelling vision of the ultimate goal. Aggressive target dates and outcomes can spur creativity, innovation, and intellectual curiosity. It provides a common aspiration, which helps foster alignment so that the many disparate parts of a large organization can work together toward the same goal. As an institution, UIC recognizes the need to be flexible – given the complexity of the challenge of achieving carbon neutrality, strategies should be designed to be iterative and adaptable.

UIC Climate Commitments Development Process and Methodology

The UIC Climate Commitments were developed by the Office of Sustainability in conjunction with the Chancellor's Committee on Sustainability and the Environment (CCSE). Formed in 2008, the CCSE is composed of UIC employees including faculty, administrators, and operational managers, as well as student representatives. The CCSE is divided into five subcommittees that developed the content for this document working from other guiding plans, current data on campus indicators, and their technical expertise. Those subcommittees include Energy and Utilities, Grounds, Sustainable Materials, Transportation, and Teaching and Learning.

UIC developed our comprehensive Climate Action Plan (CAP) in 2009 that details strategies, goals, and actions that will reduce GHG emissions from 2004 levels by 40% in 2030 and by at least 80% in 2050.
without accounting for offsets, to meet its commitment as a 2007 signatory to the American College and University Presidents' Climate Commitment (now known as Second Nature). In October 2015, Chancellor Amiridis signed the updated Second Nature Climate Commitment that challenge us to even higher goals. The aspirational goals and short-term action items build upon UIC’s existing progress towards our sustainability goals, our Climate Action Plan, and other governing and guiding documents such as:

- **To Green and Beyond**: Excellence Through Sustainability at UIC (Strategic Sustainability Thinking Report) (2012)
- **UIC Master Plan** (2010)
- **Urban Transformations: A Phased Approach to Green Infrastructure Implementation at the University of Illinois at Chicago** (2014)
- **UIC Multimodal Transportation Plan** (2015)

The CCSE is updating the goals of the Climate Action Plan to include the new resilience commitment and the recommendations of To Green and Beyond. These new goals are now the UIC Climate Commitments and include four major categories in order to reduce carbon emissions, reduce waste, increase water efficiency, and increase biodiversity at UIC.

*Note: Data in this document has been collected from internal campus reporting and facilities and utilities data*
Carbon Neutral Campus
1. Carbon Neutral Campus

UIC pledges to achieve carbon neutrality by 2050. UIC will be a carbon neutral campus once the amount of carbon the university emits through its operations, purchased electricity, and travel is reduced or offset entirely. In Fiscal Year (FY) 2014, UIC’s total emissions were 344,000 metric tons of GHG, measured in carbon dioxide equivalents (mtCO₂e). Our GHG emissions profile for FY2004 to FY2014 is shown in Figure 1. See our Climate Action Plan (CAP) for more details on how GHG emissions are tracked and calculated. Our GHG emissions are also publicly reported on the Climate Commitment website.

The overall goal of carbon neutrality is to dramatically reduce the concentration of global carbon dioxide in the atmosphere from the current level of approximately 400 parts per million (ppm). A sharp increase from pre-industrial levels of approximately 280 ppm, the current elevated levels of carbon dioxide are highly correlated to the burning of fossil fuels and changes in land use that have occurred since pre-industrial times, causing an increase in average global temperatures. There is a high probability of catastrophic impacts if the global mean temperature increases over 1.5 - 2 degrees Celsius. In order to limit that temperature rise, global carbon emissions need to be reduced approximately 40-70% below 2010 levels by 2050 (International Panel on Climate Change, 2014).

Note: This document uses the following terms interchangeably: carbon emissions, greenhouse gas (GHG) emissions, and carbon dioxide equivalents (CO₂e).

Aspirational Goals

1A. Reduce Building Greenhouse Gas (GHG) Emissions
Reduce carbon emissions related to building operation by 8,500 mtCO₂e per year over the next five years.
Carbon emissions from building operations, such as heating and cooling, represent about 80%, or 285,000 mtCO₂e (million metric tons of carbon dioxide equivalents), of our FY2014 total. If we achieve a reduction of 8,500 mtCO₂e per year from buildings over the next five years, we will achieve a 15% overall reduction from FY2014 levels for building related emissions and move decisively down the path to achieving carbon neutrality by 2050. This includes building operations and could also extend to plant energy generation and power purchasing.
1B. Invest in Renewable Energy

**Purchase renewable energy through a long-term power purchase agreement.**

Renewable energy capacity has grown in the US by almost a factor of seven in the past ten years and continues to grow. Building upon this growth, UIC has the potential to hedge or stabilize its energy costs through a 10-year, long-term power purchase lease to reach its renewable energy goals of 25% of purchased electricity by 2025.

A power purchase of 44,000 MWh/year (megawatt-hours per year) would result in an annual carbon emissions reduction of 30,224 mtCO₂e (million metric tons of carbon dioxide equivalent), or 8.8% of our current total carbon emissions. Based on the experience of Prairieland Energy in procuring renewable energy for the University of Illinois, the difference in cost between non-renewable and renewable energy might vary between $3-6/MWh. This strategy would likely cost under $200,000/yr. Over the course of such a long-term contract, renewable energy prices may end up being less than the cost of non-renewable. This single purchase alone would approximately meet the reduction goals for Aspirational Goal 1B for the next five years and is likely to be considerably less than the capital investment required for energy efficiency projects that would achieve that scale of impact.

The Office of Sustainability and UIC Campus Utilities will work with Prairieland Energy in partnership with the University of Illinois at Urbana-Champaign (UIUC) to develop a power purchase request for proposal for renewable energy sources.
Integrate solar power electricity generation into campus structures, such as roofs, parking lots and structures.

Our 2009 Climate Action Plan (CAP) suggests that UIC could provide 2.5% of its energy through on-site solar by 2020 and 5% by 2030. UIC currently has a 106 kW photovoltaic solar generating system on top of Lincoln and Douglas Halls that generate approximately 120 MWh each year. Notably, 2.5% of purchased electricity is equivalent to a reduction of 4,600 mtCO₂e per year, or a 3,286 kW system capacity on approximately 236,000 square feet, an area about two-thirds the size of UIC’s Parking Lot 1. This would require an investment of $13 million, which could be partially funded through grants, public-private partnerships, or an on-site power purchase agreement.

1C. Utilize Parking Lots and Structures

Use parking lots and structures as an environmental asset to generate and save energy.

The energy aspects of this goal can be accomplished through installation of LED lighting and solar panels (as described in 1B).

1D. Enhance Existing Power Generation

Optimize use of on-site cogeneration to maximize efficiency.

UIC recently saw an increase in carbon emissions from its buildings operations since we began tracking emissions in 2004. The carbon emissions from UIC’s on-site cogeneration are significantly lower than those from purchased electricity. Cogeneration, or combined heat and power, is the use of an engine or turbine to generate electricity and utilize the excess heat generated from the equipment for heating buildings and is up to twice as efficient in its energy use as a typical coal or gas-fired power plant. Yet in the late 2000’s, UIC purchased more electricity than it produced in our two power plants due to the relatively low price of purchased electricity compared to UIC generated electricity. UIC Campus Utilities is assessing the repairs needed to assure that its cogeneration assets are available and can be utilized to the greatest extent possible when economically feasible.

1E. Increase Alternative Transportation

A number of recent planning efforts have shaped the University’s transportation landscape with the intention of enhancing overall environmental sustainability and livability. This includes our Climate Action Plan (CAP) (2009), the UIC Master Plan (2010), and the UIC Multimodal Transportation Plan (2015), among others.

Every day, approximately 30,000 students, faculty, and staff flow into the campus using the wide range of transportation options connecting UIC to Chicago’s neighborhoods and the greater region that range from single-occupancy vehicle travel to walking to biking to carpooling and ride-sharing to public transportation. As of 2014, approximately 15% of UIC’s total carbon emissions are due to transportation: 7% from faculty and staff commuting, 6% from student commuting, 2% from air travel, and 1% from the campus fleet.

Faculty, staff, and students at UIC already utilize alternative transportation (anything other than single-occupancy vehicle travel) far more than the greater Chicago region. 60% of UIC commuters choose alternative transportation versus about 40% for Cook County overall (2014 Multimodal Transportation Plan, CMAP, 2014). Still, the associated carbon emissions of UIC’s commuters should be reduced. Finally, issues related to travel between UIC’s East Campus and West Campus, as well as to and from the UIUC and other University of Illinois campuses, should be addressed.
Eliminate barriers to alternative modes for intracampus travel and commuting. Single-occupancy vehicle travel should be reduced between the two sides of campus by encouraging alternative transportation. The University will explore ways to support alternative transportation options, including providing Divvy and public transit passes for employees to travel around campus. UIC will also explore possibilities for innovative pricing structures for parking on campus to allow for more equity among users of various modes of commuting.

Short-Term Action Items

I. Increase Building Energy Efficiency
i. Continually reduce energy demand and intensity
UIC has reduced its overall energy use intensity by 19% since 2004 (see Figure 2) without normalizing for weather. These achievements have been accomplished by integrating energy efficiency into all renovation projects that involve heating, ventilation, air conditioning, and lighting systems. In addition, Energy Performance Contracting has been used as a funding mechanism for a number of these projects.

![Energy Use Intensity Graph](image)

Figure 2: Energy Use Intensity (EUI) for total Chicago campus. Dashed line is trendline. (Source: UIC Campus Utilities, UIC Facilities Information Management, Office of Sustainability)

Eighty-one energy efficiency projects implemented from FY2013 to FY2015 are calculated to have reduced carbon emissions by 12,600 metric tons. (Figure 3). The resulting annual savings in utility costs are calculated to be $1.4 million. There are still many opportunities to implement energy efficiency measures on campus.
UIC will implement design requirements for energy use intensity for building retrofits and new construction. The Office of Sustainability is working on a matrix to provide guidance for these design requirements.

**ii. Update UIC’s Energy Policy and the UIC Building Standards to promote energy efficiency.** These requirements will be integrated into the updated UIC Sustainable Building Standards and coordinated between the UIC Office of Capital Programs, UIC Facilities Management Small Projects, UIC Campus Architect, and the Office of Sustainability

**iii. Utilize LED lighting for all new lights and retrofit others by 2025.** Because LED lighting can provide the same level of lighting intensity while using significantly less energy, LED lighting generally has the potential to reduce energy consumption by a factor of 8 and reduce maintenance costs due to the need for less frequent bulb replacement.

**iv. Install outdoor lighting that is sensitive to night sky protection.** Light pollution affects both UIC’s environment and safety: certain lights throw off glares that can actually make it harder to see at night, and many lights left on at night waste energy and can confuse wildlife. Lighting should be directed away from the sky and provide the necessary amount of lighting for safety, while not being excessive. This strategy can be addressed through integration of night sky protection policies with the UIC Sustainable Building Standards. By strategically adjusting outdoor lighting brightness and locations, UIC can both conserve energy and minimize light pollution.

**II. Build to Higher Level of LEED Certification**

**i. Seek LEED Gold Certification for all new construction and aspire to LEED Platinum Certification.** The U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) is the most commonly used green building rating system. Points are earned in a variety of areas including: site location, grounds operations, water and energy efficiency, materials (recycled content; local sourcing), recycling, and indoor air quality. There are four levels of rating: Certified, Silver, Gold, and Platinum. UIC has three LEED Gold certified buildings – Lincoln Hall, Douglas Hall, and the Mile Square Health Center. UIC will seek LEED Gold Certification and aspire to LEED Platinum for all new construction to the extent the project’s other parameters can also be met (e.g. regulatory and financial).

**ii. Continue to achieve LEED Silver Certification for applicable renovations over $5 million.** UIC’s Energy Policy currently states that, “in accordance with the UIC Building Standards and our Climate Action Plan (2009) future new construction, remodeling, and renovation projects of $5 million, or greater shall meet the current LEED new construction standard, or the most applicable standard of the LEED
Family and be certified at the Silver level or better. New construction, remodeling, and renovations totaling less than $5 million should comply with the LEED Silver requirements to the greatest extent practicable including those credits UIC requires as mandatory, as they appear in the UIC Building Standards. To date, no renovation projects have been certified, but the College of Medicine Learning Center is expected to earn Gold-level certification.

This action item will raise the level from Silver to Gold for new construction and stresses that major renovations be constructed at the Silver level.

**III. Enhance Campus Fleet Management and Campus Shuttle Buses**

**i. Increase proportion of hybrid, electric, and compressed natural gas (CNG) vehicles in campus fleet to 75% within five years.**

UIC can reduce the carbon emissions of its fleet by reducing the number of gasoline-powered vehicles. UIC has been part of the voluntary Illinois Green Fleet initiative since 1997. To date, UIC has purchased 8 CNG powered vehicles and 17 gasoline-electric hybrid vehicles (including 3 buses) in its fleet of 243 licensed vehicles. UIC will increase the number of hybrid, electric, and/or CNG vehicles to comprise 75% of the campus fleet, based on historical turnover rates, while leveraging local and federal grant funds as available.

**ii. Reduce campus fleet fuel consumption by 15% within five years.**

By 2021, the University will reduce campus fleet fuel consumption by replacing older vehicles and equipment conversion. UIC Facilities Management and the CCSE will develop a policy that requires electric, hybrid electric, and CNG vehicles be purchased.

- Electric vehicles will be purchased for local use
- Hybrid electric vehicles will be purchased for out of electric range use
- CNG vehicles or vehicles converted to CNG will be purchased where electric is not viable
- E85 vehicles will not be purchased since UIC does not have a E85 fueling station

**iii. Reconfigure campus shuttle bus routes to reduce carbon emissions.**

Improving campus shuttle bus services can increase the fuel efficiency of its travel, yield cost savings, and attract new riders. A reconfiguring study on this topic began in 2015 and the findings are under review. Research included extensive focus group interviews across the campus community and UIC Facilities Management drivers. Options for improving efficiency include fewer stops and returning to a “one route” system for the intracampus shuttle.

**iv. Promote a culture of no-idling for vehicles on campus.**

Tailpipe emissions include massive amounts of carbon emissions including carbon dioxide (CO2) and nitrogen oxides (NOx). The former is responsible for over approximately 60% of the enhanced greenhouse effect, causing global climate change. NOx is estimated to be 200-300 times more potent greenhouse gas than CO2 and is a major component of smog.

Building upon UIC’s existing policy for diesel service vehicles ([Public Act 094-0845](https://www.gap.illinois.gov/Pages/ActPage.aspx?Act=094-0845)), the University will develop procedures to ensure that this policy will be adhered to not only for diesel service vehicles, but for all UIC service vehicles.
IV. Reduce Emissions from Interuniversity Travel

i. Reduce private vehicle travel to and from other University of Illinois campuses.
Decreased business travel via single-occupancy vehicles can help reduce UIC’s carbon emissions and costs. If funded and implemented, a unified communications system for web-conferencing could reduce travel needs for meetings, especially within the University of Illinois system. The Chicago, Springfield, and Urbana-Champaign universities are served by Amtrak, which offers an alternative to driving and is usually less expensive than the personal car reimbursement costs to the University. Travel and Expense Management (TEM) data revealed that there are approximately 300-500 Amtrak trips per year made by UIC personnel, with savings over driving between $60 and $100 per trip. Amtrak schedules lend themselves to trips that are multi-day and allow for flexibility in travel times, as there are limited trains on a daily basis. UIC will encourage train travel as an option to be explored and used when appropriate.

V. Support Implementation of the 2015 Multimodal Transportation Plan

i. Improve pedestrian and bicycle circulation and safety throughout the UIC campus and surrounding area.

ii. Expand bike-parking capacity by 10% within five years.
Bicycle ridership is increasing in Chicago as the network expands. UIC currently has approximately 1,050 bicycle parking spaces, an increase of 220 spaces since 2011. Adding 10% (105 spaces) over five years could help to meet the ever-growing demand.

VI. Educate for Energy

i. Utilize energy dashboards as educational tools.
UIC Utilities unit will continue to add digital “smart” metering of electricity and heating and cooling systems. Currently, this data is collected from about one-third of UIC’s buildings and is being used to create energy dashboards, which will make the data available online to the campus community. The dashboards could also include carbon emission profiles for the buildings. The dashboards and the underlying data will enable applied learning and research opportunities for students.

ii. Create energy conservation campaigns by using energy dashboards.
Once the energy dashboards are in place, energy savings competitions can be hosted between buildings. Major initiatives to reduce duplicate appliances have the potential to save UIC millions of dollars in operations and system maintenance costs.

iii. Develop both curricular and co-curricular programs that promote energy literacy.
There are several examples of existing energy-literacy programs. The Energy Initiative (based in the Department of Physics, College of Liberal Arts and Sciences, and the College of Engineering) introduced two courses: PHYS-EAES 116, “Energy for the Future Decision Makers” and LAS 493, “Topics in Energy and Sustainability.” The Energy Initiative has has also convened the Summer Institute on Sustainability and Energy (SISE) for four years. This summer, an additional Summer Institute on Electrochemistry will be initiated. The Office of Sustainability has increased energy literacy by created programming around energy use on campus (Smart Grid Internship, energy conservation signage, etc.) These units and others should be supported to encourage further program development.
2
Zero Waste Campus
2. Zero Waste Campus

UIC is committed to operating an efficient campus that is continually working towards eliminating waste. The UIC Climate Commitment of Zero Waste Campus refers to sustainable waste management system that emphasizes waste prevention as opposed to end-of-pipe waste management. It is a whole systems approach that aims for a massive change in the way materials flow through society, resulting in no waste. UIC defines zero waste as a 90% diversion rate of landfill-bound material through techniques such as source reduction, materials reuse, recycling, and composting. Zero waste systems prevents pollution and avoid costs associated with landfill disposal. It also reduces carbon emissions by diverting discarded materials from methane-generating landfills and avoiding carbon emissions associated with extracting, processing, and transporting raw materials and waste. By implementing a Zero Waste Campus approach, UIC will significantly decrease the university’s impact on environment.

Figure 4: Depicts UIC’s recycling rate trends for the last 10 years UIC’s recycling rate and key milestones. Red line represents building level recycling rates. Blue line represents recycling rate include materials recovered at Materials Recovery Facility (MRF), or a specialized plant that receives, separates and prepares recyclable materials for marketing to end-user manufacturers.

There are two basic methods of recycling on campus: the efforts of individuals, and the efforts of the University and specialized workers to divert waste into recycling and compost. In 2009, the campus began to send our municipal solid waste (also known as trash) to a materials recovery facility (MRF). The MRF pulls out construction and demolition waste as well as glass, metal, plastic, cardboard, and yard waste. However, it is more economical for these materials to be recycled before it reaches the MRF, as UIC receives revenue for those materials sent to directly to the recycling facility.
Aspirational Goals

2A. Increase Waste Diversion Rates: Divert 90% of waste from landfills
UIC has operated an in-house recycling program for over 20 years, and saw the recycling rate double after the establishment of UIC’s Office of Sustainability. The University envisions steady progress towards this goal, reevaluating goals every five years (next in 2020) to assess progress in alignment with the Illinois Solid Waste Management Act. It will be impossible to achieve this goal if UIC relies solely on landfill diversion. It will require a concerted effort around procurement of services and materials to ensure that we can close the loop by purchasing materials that reduce waste going to landfill and promote materials that use recycled materials. In addition, as a number of our student experience food insecurity, we should include vendor requirements to support food-to-mouth rather than food-to-waste programs to feed these students while reducing excess food preparation.

2B. Shape a new culture of closed-loop waste management operations

Develop a Recycling and Composting Policy
A closed-loop waste management operation means controlling material inputs to maximise recycling of materials and minimizing waste that goes to landfills, while greatly reducing the environmental footprint. Given the Illinois Solid Waste Management Act, the goal of the recycling program at UIC is to minimize waste by encouraging resource conservation, avoiding disposable materials, emphasizing reuse, recycling, and landfill diversion. A significant corollary of our recycling program is composting, another example of a closed-loop of material. Campus composting includes yard waste as well as the food scrap collected at our campus dining halls. The CCSE Sustainable Materials subcommittee will draft a policy that reinforces these statements.

Divert 90% of construction and demolition waste from landfill
UIC has a policy to reduce reliance on landfilling of construction and demolition (C&D) waste, which includes the aim to recycle and/or salvage at least 75% of non-hazardous C&D debris by weight, while at a minimum, 50% must be recycled or salvaged. Complete tracking and documenting C&D waste will be achieved by requiring UIC Project Managers to provide records of waste and recycling hauled off-site.

2C. Serve as a resource for the City of Chicago by planning an on-site or local area facility for food waste recovery, such as food scrap composting, anaerobic digestion, and waste-to-energy generation
UIC will expand food scrap collection on campus and plan an on-site facility for food waste recovery, such as food scrap composting, anaerobic digestion, and waste to energy. UIC will continue to explore on-site as well as district opportunities for composting through collaborations with Cook County, the Illinois Medical District, City Colleges, Chicago Public Schools, and local restaurants. We seek expansion of food scrap collection as much as possible in individual units of UIC Dining Services, UIC Catering, and UIC’s concessions. UIC will evaluate opportunities for on-site composting (e.g., biogas production as a renewable energy source), new technologies that support Aspirational Goal 2B (above) and possibilities of pilot projects.

In addition, as a number of our students experience food insecurity, we should include vendor requirements to support food-to-mouth rather than food-to-waste programs to feed these students while reducing excess food preparation.
2D. Enhance Zero Waste Education

Design new and integrated curriculum around the concept of zero waste.
The section on Teaching and Learning discusses ways to integrate sustainability into the curriculum, including the concept of zero waste.

Promote co-curricular activities and educational programs for waste reduction.
UIC will develop activities, programs, and learning experiences that complement zero waste curriculum.

Short-Term Action Items

I. Promote Activities and Educational Programs for Waste Reduction
In addition to paper, cardboard, and glass, metal, and plastic recyclables, the Office of Sustainability will continue to promote the variety of collection programs that are currently offered:

• Great Stuff Exchange: a Free Store and event to redistribute unwanted office supplies to students, faculty, and staff
• Electronic Recycling: all electronic waste from campus is broken down into components to be reused in industry
• Writing instruments: collected and recycled through TerraCycle
• Pipette tip boxes: colorful lab plastics, made of #5 polypropylene plastic are collected and recycled by UIC
• Some food scraps are collected in the back of the house by UIC Dining Services in the Student Center East
• Lab Share: a Free Store and event to redistribute usable supplies from laboratories to students, faculty, and staff
• Alkaline batteries: collected at numerous sites on campus and recycled by UIC Facilities Management
• Surplus food: Food Recovery Network works with UIC Dining Services to pick up surplus prepared food and deliver it to hunger-fighting agencies
• Nitrile gloves: recycled through a partnership with Kimberly Clark - collections of gloves occurs in two lab buildings
• Plastic bags: UIC Student Centers will start collecting plastic bags sometime in the Spring 2016 semester

Through its Eco-Educator program, the Office of Sustainability recruits volunteers to stand by recycling containers at major events and instruct on proper waste sorting. These activities should continue to be supported.

II. Integrate Requirements for Sustainable Practices and Materials into Purchasing and Service Contracts
A key component of a sustainable materials program is to promote purchases of commodities that are made with recycled content, such as paper with minimum 30% recycled content. We must integrate sustainability into all relevant purchasing and service contracts, such as construction, food service, and cleaning supplies.
III. Reduce Bottled Water Use
About 50 billion plastic water bottles end up in U.S. landfills each year, and another 10 million are recycled. Limiting departmental purchases will reduce waste, save money, and shipping/transaction time. UIC Facilities Management continues to retrofit existing water fountains, install water bottle filling stations, and replace large water coolers with departmentally-funded new water fountains.

IV. Increase the Number of Green Guide-Certified Events
In an effort to promote green practices across units, the Office of Sustainability developed five different Green Event Guides, available online at https://sustainability.uic.edu/campus-resources/green-event-guides. The guides are categorized by group type (departments and student organizations); location type (events in the UIC Student Centers or Forum/ Pavilion); or a guide for Catering Services. The guides help on and off-campus event organizers to reduce waste and energy use, source local and healthy food, and encourage alternative transportation. The Office of Sustainability will work with the appropriate campus units to advance the use of these guides. Eco-Reps and campus business managers will promote the use of the guides in their unit operations.
3 Net Zero Water Campus
3. Net Zero Water Campus

Net Zero Water Campus is defined as using no more water than that which falls within UIC’s geographical footprint. Based on the average annual rainfall, UIC’s watershed is about 228 million gallons of water. Currently, UIC consumes about 500 million gallons. To achieve Net Zero Water Campus, UIC needs to reduce water consumption by 55%. Overall strategies to accomplish that level of water reduction include efficiency initiatives in buildings and UIC power plants, as well as the minimization of irrigation with potable water, and stormwater capture for irrigation and greywater use.

Aspirational Goals

3A. Manage and Reduce Stormwater through Design and Retrofitting

UIC can mitigate flooding and runoff water pollution caused by rain events by slowing the flow of the stormwater and emphasizing on-site water retention. In urban environments, impervious surfaces in the form of buildings, roads, parking areas, and walkways interrupt the natural hydrologic cycle by preventing the infiltration of rainwater into the soil. The resulting stormwater runoff can collect surface pollutants and can contribute to combined sewer overflow (CSO) events, as well as causing damaging and costly flooding events. In FY2015 a team of students competed and won the U.S. Environmental Protection Agency’s Rainworks Design Competition with their plan: Urban Transformations A Phased Approach to Green Infrastructure Implementation at the University of Illinois at Chicago. Their model plan for the east side proposed that through a phased approach to green infrastructure, UIC could reduce stormwater runoff by 10% by 2020 and 25% by 2030. UIC will explore ways to utilize green infrastructure to manage stormwater, protect water quality and improve watershed health. Figure 5 (below) shows the existing conditions on the east side. UIC will:

- **Design and retrofit hardscapes** (impermeable surfaces such as plazas, walkways, parking lots and structures, driveways, etc.) to minimize flooding and runoff. Investigate ways to incorporate and retrofit for permeable pavement and underground cisterns, as well as the installation of green roofs on applicable rooftops. Permeable pavement including porous concrete that captures rain where it falls, and should be considered for use in parking lots and structures, as well as other paved areas whenever feasible. Green roofs capture rain in their soil, therefore reducing the amount of runoff. In addition, green roofs reduce the heat island effect and insulate the buildings, reducing the energy needed to heat and cool them.

- **Design and retrofit landscapes** to minimize flooding and runoff by utilizing green infrastructure. UIC will investigate ways to incorporate and retrofit landscapes using bioswales and native, drought, and salt-resistant plant species.
3B. Capture Stormwater for Irrigation
UIC will explore opportunities to design and retrofit for cisterns, rain barrels, or other water retention systems on campus.

3C. Explore Design for Greywater Infrastructure
Greywater refers to wastewater originating from non-toilet sources including wash water from kitchens, bathrooms, and laundry appliances. This water can be reused for flush fixtures or for landscaping irrigation, among other uses. The application of greywater reuse in urban water systems provides substantial benefits for both the water supply subsystem by reducing the demand for fresh clean water as well as the wastewater subsystems by reducing the amount of wastewater required to be conveyed and treated. UIC can explore the potential for greywater system design for new buildings with a feasibility study and by developing an opportunity for a pilot project on campus.
Short-Term Action Items

I. Manage and Reduce Stormwater within Parking Lots and Structures

i. Construct UIC Parking Lots 1A and 1B with permeable pavement and a mix of concrete types: porous, permeable concrete in the parking stalls and traditional concrete in the drive lanes. Permeable pavement naturally filters stormwater and reduces pollutants. Currently, faculty and students from UIC’s Department of Civil and Materials Engineering are interested in evaluating the effectiveness of these systems.

II. Reduce Campus Water Use

i. Complete water consumption assessments of campus facilities. The Office of Sustainability will continue to audit restrooms, kitchens, and other water-consuming equipment to determine how water is used. These audits include measuring water flows from bathroom fixtures and daily usage counts. Using this data, water consumption for specific restrooms can be calculated. One recent case study for Student Center East has been completed that indicates the potential for water savings is quite significant. The estimated water savings are 3.8 million to 9.5 million gallons per year ($28,000-$72,000/annually) with a 14-34 month payback. Already, UIC’s power plant has improved water chemistry to realize $100,000 in annual water and sewer savings due to reduced water consumption.

ii. Establish goals for water consumption reduction. The CCSE Energy and Utilities Subcommittee will recommend water consumption goals based on audits and benchmarking. Since 2012, UIC has reduced its water consumption by around 14% (24 million gallon/year) on the east side and 17% (77 million gallon/year) on the west side, equivalent to a savings of $768,000 per year. Figure 6 (above) shows water consumption on the east and west sides over a four-year period. The major cause of the spike in water consumption from FY2012 to FY2014 is district energy system leaks. Once repaired, there was a significant decline in consumption, demonstrating the importance of investing in utility systems maintenance and monitoring.
III. Update UIC Building Standards to Promote Water Conservation through Efficiency Improvements

These requirements will be integrated into the updated UIC Sustainable Building Standards and coordinated between the UIC Office of Capital Programs, UIC Facilities Management, and the Office of Sustainability.
Biodiverse Campus
4. Biodiverse Campus

The term biodiversity refers to the variety of all forms of life such as plants, animals, and microorganisms in an ecosystem. In its commitment to being a biodiverse campus, UIC will take steps to protect and support health and diversity of ecosystems on campus.

For many city dwellers, exposure to urban parks and other green spaces will provide most of their encounters with the outside world. Such experiences can have a lifelong impact on awareness and concerns about environmental issues. An institution as large as UIC has the potential to educate and inspire students, faculty, staff, and neighbors through its thoughtful and sustainable approach to increasing biodiversity in its open spaces. In addition to their educational benefits, biodiverse spaces increase the attractiveness of the campus, thus playing an important role in recruiting students and employees. By supporting outdoor landscapes

Aspirational Goals

4A. Promote Consumption of Local Food on campus

Explore contracting options with local and regional food vendors and opportunities for on-site food production.

UIC can support more resilient and sustainable food systems by making locally grown and sourced food more widely available to the campus community. According to the United Nations, 75% of the world’s food is generated from only 12 plants and five animal species. Increasing the consumption of local foods on campus promotes agricultural biodiversity, as well as having other ecological benefits such as reducing food miles, meaning the miles which a food item is transported from producer to consumer
Short-Term Action Items

I. Promote Local Produce on Campus

i. Host a farmers market and bring local and regional food to the campus community.
A farmer’s market has been hosted on campus for two years. Opportunities to buy fresh, local food should be made more widely accessible to people on campus.

ii. Investigate the utilization of the land near the Plant Research Laboratory for food production.
The Department of Biological Sciences hosted a vegetable garden in the past next to its greenhouse, which is located at Halsted and Taylor. A partnership between the appropriate parties could be explored as an opportunity for a food production on campus.

iii. Include provisions to increase local food sourcing in future food service contracts.
When the next food service contract is up for renewal the vendors should be required to source a larger portion of its food locally. Currently, Illinois State Code (30 ILCS 595/10) requires that that 20% of all food and food products purchased by public universities be local farm or food products by 2020. UIC will strive to exceed that goal.

II. Enhance Tree Canopy and Diversity
Greater plant and animal diversity on campus can have positive economic impacts on surrounding areas. In many cases, residential properties adjacent to greenways or urban parks have a higher market value than similar non-adjacent properties. Furthermore, an institution’s public display of informed and sustainable landscaping practices can influence the landscaping decisions of nearby residents and business owners.
i. Increase tree biodiversity by planting no more than 5% of the campus tree inventory with trees of the same species and 10% of the same genus.
Doing so is beneficial for several reasons, one being that a balanced makeup of trees helps lessen susceptibility to insects and diseases that predominantly affect one species or genus. This can help prevent the associated catastrophic loss.

ii. Increase tree canopy coverage to 25% by 2030.
Tree canopy coverage refers to proportion of land area covered by tree crowns, as viewed from the air. Seventeen percent of the UIC campus is currently covered by tree canopy. This includes all areas of the campus, including buildings, open space, parking lots and structures, sidewalks, etc. UIC needs to increase tree canopy coverage by increasing the number of trees, and increasing the leaf circumference. Species with high leaf circumference to area and surface volume are also more efficient at sequestering carbon and removing pollutants (UIC Campus Forest Management Plan, 2011). Trees remove pollutants like carbon monoxide, ozone, nitrogen dioxide, particulate matter, sulfur dioxide, and carbon dioxide from the atmosphere via the leaf.

iii. Use sustainable landscaping methods on campus
By including native, drought- and salt-resistant plants in campus landscaping efforts, UIC can support pollinators as well as reduce maintenance costs via avoided pesticide, herbicide, and water usage. If managed well, these areas can be quite beautiful and self-sustaining with very little maintenance required. Urban landscape designs that maximize vegetative volume, along with spatial and vertical heterogeneity, are associated with increased species richness of vertebrates and invertebrates. Garden areas with high abundance and broad variety of flowering plants help maintain a high diversity of butterflies, bees, and other pollinators.
Teaching and Learning

As an institution of higher education, we are missing a key opportunity if we are not educating students about the challenges of climate change and how to develop solutions. The UIC Climate Commitments primarily address our operations, but UIC also aspires to infusing the curriculum and co-curricular learning with sustainability. This achievement will require the full engagement of the university’s academic community in creating meaningful interdisciplinary and sustainability-focused learning and research opportunities for its students on both the undergraduate and graduate level.

Currently, UIC integrates sustainability into curriculum offerings through faculty-initiated course development. UIC’s course catalogue lists over 300 courses that are directly or indirectly linked to the ecological, environmental, social, and cultural facets of sustainability. Many faculty are also engaged in sustainability-related research, through the Institute for Environmental Science and Policy (IESP) and other academic and research programs. However, there has been no coordinated approach for developing and guiding sequences of courses that deliver the philosophy, knowledge, skills, and tools that prepare students for entry to the employment market.

During the Sustainability Strategic Thinking process that occurred from 2012-2015, the committee identified existing assets on campus and developed recommendations for advancing sustainability through the campus’s teaching and learning activities. The aim is to integrate sustainability concepts, themes, and foundational knowledge into the undergraduate and graduate experience so that students graduate with identified competencies essential to adopt the goals of sustainability. There are two existing sets of actions pertaining to teaching and learning: the goals and action items from the Chancellor’s Climate Commitments mentioned above, and the recommendations from the Sustainability Strategic Thinking report “To Green and Beyond: Excellence through Sustainability at UIC” listed below, along progress with existing research, education and awareness initiatives (in bullet points). As the newest subcommittee of the CCSE, the members will work to develop strategies to advance sustainability education on campus.

Recommendations

1. Enhance and expand opportunities for undergraduate and graduate academic programs related to sustainability and energy

- UIC’s course catalog includes a long list of sustainability and energy related classes that can be found at [http://sustainability.uic.edu/education/courses/](http://sustainability.uic.edu/education/courses/). Not all courses are currently or regularly scheduled.
- The College of Urban Planning and Public Affairs (CUPPA) has approved a minor in Urban Sustainability and with it introduced US130 – Principles of Urban Sustainability. The minor is open to undergraduates in all colleges and requires completion of three courses.
- Work has commenced under the auspices of the Graduate College to develop a sustainability-focused master’s program
- The UIC Experience sustainability focused track that aligns with the internship (see 3b below).
- Discussions are ongoing regarding an integrated Masters of Public Health and Urban Planning and Policy Program between the School of Public Health and CUPPA.
2. **Provide support for colleges and programs to collaborate in establishing interdisciplinary sustainability minors and majors, as well as non-degree for-credit and not-for-credit certificates**

   - The UIC Extended Campus. Offers a platform for the development of revenue-generating programs that are generally offered on-line or in a blended format. This opportunity to offer a sustainability focused program is currently being explored.

3. **Establish co-curricular programs that educate students, faculty, and staff about sustainability**

   a. Support sustainability-related student learning projects and community engagement opportunities, including initiatives that provide experiential learning and build student leadership, and additional study and employment in sustainability-related field

   b. Create learning opportunities for external students and the broader community

   - The Office of Sustainability instituted the Sustainability Internship Program (SIP) that is an applied learning course (seminar) along with student internship placements. Work is underway to create a dedicated course that would be cross-listed in multiple departments.

   - The Energy Initiative has convened the Summer Institute on Sustainability and Energy (SISE) for four consecutive years. This summer an additional Summer Institute on Electrochemistry will be initiated.

   - UIC Heritage Garden is a hands-on learning project with an internship program. Student interns work with faculty, staff, and community members to connect horticulture with environmental sustainability, cultural diversity, and social justice. There are currently eight satellite gardens on the east side of campus.

4. **Expand CCSE to engage more stakeholders with appropriate diverse expertise to develop recommended competencies and facilitate the integration of sustainability and energy topics across college research and educational programs**

   - The CCSE Teaching and Learning Subcommittee was established in December 2015 for this purpose.

5. **Increase the number of sustainability-related courses that qualify for General Education Credit.**

   - Two courses currently are offered at UIC: PHYS-EAES 116 “Energy for the Future Decision-Maker” and US130 “Principles of Urban Sustainability”.
Conclusion

The UIC Climate Commitments provide the goals to update our CAP, and the action items for immediate implementation. The CCSE is comprised of many of the students, faculty, and staff that are needed to develop the plan and execute these action items. In combination with the recommendations from the Teaching and Learning Subcommittee, UIC is positioned to continue to be a leader in both sustainability and higher education.

With a special thanks to the Chancellor’s Committee on Sustainability and Energy (CCSE) Subcommittees:

Committee Chairs
Rob Dixon and George Crabtree

Energy and Utilities Subcommittee

Grounds Subcommittee
Robert Mason-Gamer, Carly Rizor, Julie Finlay, Kristy Kambanis, Emily Minor, Tania Sosa, Robin Buell Sylvester, John Wagner, Benjamin O’Connor

Sustainable Materials Subcommittee
Ning Ai, Gabriel Bernal, Rob Anderson, Karen Baker, William Bavirsha, John Burch, Anna Calix, Bill Colwell, Joshua Dorka, Kevin Fair, Tamnekia Grant, Denise Rosen, Eric Simon, Travis Hawks

Transportation Subcommittee
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Office of the Chancellor
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GLOSSARY OF TERMS and ACRONYMS

Alternative Transportation: any type of commuting other than driving alone

Biodiversity: contraction of “biological diversity,” generally refers to the variety and variability of life on Earth in terms of variability within species, between species, and between ecosystems. It is a measure of the variety of organisms present in different ecosystems. This can refer to genetic variation, ecosystem variation, or species variation (number of species) within an area, biome, or planet.

Bioswale: landscape elements designed to remove silt and pollution from surface runoff water. They consist of a swaled drainage course with gently sloped sides and filled with vegetation, compost and/or riprap.

Carbon dioxide equivalents: is a measure used to compare the emissions from various greenhouse gases based upon their global warming potential. Carbon dioxide is not the only greenhouse gas, but it is the most abundant. Carbon dioxide equivalents are often measured as million metric tons of carbon dioxide equivalent, or mtCO₂e.

Carbon emissions: a shorthand for carbon dioxide equivalents or greenhouse gas emissions.

Carbon neutral: or having a net zero carbon footprint, refers to achieving net zero carbon emissions by reducing carbon emissions to the greatest extent possible and offsetting the remainder through sequestration or offsets.

Co-curricular: activities, programs, and learning experiences that complement, in some way, what students are learning in school—i.e., experiences that are connected to or mirror the academic curriculum.

Compressed Natural Gas (CNG): is methane stored at high pressure and can be used in place of gasoline. CNG combustion produces fewer undesirable emissions than traditional gasoline fuels.

Chancellor’s Committee on Sustainability and Energy (CCSE): A committee and subcommittees of faculty, operational and administrative staff, and students tasked with creating a more sustainable UIC. https://sustainability.uic.edu/getinvolved/ccse/.

Climate Action Plan: a plan made up of strategies to achieve a carbon reduction goal or carbon neutrality. It is typically comprised of multiple strategies that address operational activities that generate carbon emissions such as powering buildings, transportation, and waste. Strategies may involve fuel substitution, efficiency, renewable energy, waste reduction, projects that offset emissions, and purchase of offsets.

Energy Use Intensity: the amount of energy per area that a building consumes. Typically expressed in British Thermal Units (btu) per square feet.

Food miles: a mile over which a food item is transported from producer to consumer, as a unit of measurement of the fuel used to do this.

Greenhouse gas (GHG): a gas in an atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect (global climate change). Human activities since the beginning of the Industrial Revolution have produced a 40% increase in the atmospheric concentration of carbon dioxide, from 280 ppm in 1750 to 400 ppm in 2015. It has been estimated that if greenhouse gas emissions continue at the present rate, Earth’s surface temperature could exceed historical values as early as 2047, with harmful effects on ecosystems, biodiversity and the livelihoods of people worldwide.
LEED Certification: or Leadership in Energy & Environmental Design, is a popular green building certification program that recognizes best-in-class building strategies and practices. To receive LEED certification, building projects satisfy prerequisites and earn points to achieve different levels of certification and is administered through the US Green Building Council.

Materials recovery facility (MRF): is a specialized plant that receives, separates and prepares recyclable materials for marketing to end-user manufacturers.

Net Zero Water: means a system that is designed, constructed, or renovated and operated to greatly reduce total water consumption, use non-potable sources as much as possible, and recycle and reuse water in order to return the equivalent amount of water as was withdrawn from all sources, including municipal supply, without compromising groundwater and surface water quantity or quality.

Night sky protection: measures taken to protect against light pollution.

Permeable Pavement: is a range of sustainable materials and techniques for permeable pavements with a base and subbase that allow the movement of stormwater through the surface. In addition to reducing runoff, this effectively traps suspended solids and filters pollutants from the water.

Power Purchase Agreement (PPA): is a contract between two parties, one which generates electricity (the seller) and one which is looking to purchase electricity (the buyer).

Resilience: the ability of a system or community to survive disruption and to anticipate, adapt, and flourish in the face of change.

UIC Building Standards: https://ocp.uic.edu/building-standards.html

UIC Climate Action Plan (2009): A strategic document that outlines specific mitigation strategies to reduce UIC’s greenhouse gas emissions from 2004 levels by 40% in 2030 and by at least 80% in 2050, without accounting for offsets. http://sustainability.uic.edu/climateactionplan

Zero Waste: a system that encourages the redesign of resource life cycles so that all products are reused. Ninety percent of trash is diverted from landfills and incinerators. The process recommended is one similar to the way that resources are reused in nature.