

Table of Contents

Acknowledgements

Introduction

Overview of Commitments

Scope of iCAP 2020

Climate Leadership Commitment

Relationship to Other Commitments

Progress to Date

Emissions 101

Carbon Emissions Inventory

Historical Info

iCAP Portal

Recognition

Organization of Plan

SWATeam Process

Campus and Community Engagement

iCAP 2020 Structure

Chapter 2: Energy

Campus Energy 101

Introduction

Energy Objectives

Conclusion

Chapter 3: Transportation

Introduction

Transportation Objectives

Conclusion

Chapter 4: Land & Water

Introduction

Land & Water Objectives

Conclusion

Chapter 5: Zero Waste

Introduction

Zero Waste Objectives

Conclusion

Chapter 6: Education

Introduction

Education Objectives

Conclusion

Chapter 7: Engagement

Introduction

Engagement Objectives

Conclusion

Chapter 8: Resilience

Introduction

Resilience Objectives

Conclusion

Chapter 9: Implementation

Capacity Development

Procedures

Funding

Campus Utilities Budget

Facilities & Services (F&S)

Energy Performance Contracting

Deferred Maintenance Funding

Campus, College, and Department Budgets

Institute for Sustainability, Energy, and Environment (iSEE)

Student Sustainability Committee (SSC)

Bicycle Infrastructure and Programming Fee

Revolving Loan Funds

External Grants

Carbon Credits Sales Fund

Private Donations

Implementation Objectives

Comprehensive List of Objectives

Challenges

Conclusion: Reaffirming Our Commitment

Appendix A: Acronyms

Appendix B: Figure list

Appendix C: Contributors

Appendix D: Honorable Mention Objectives

Explanation

Funding

Energy

Transportation

Land & Water

Zero Waste

Education and Outreach

Resilience

Fossil Fuel Divestment

DRAFT

Acknowledgements

The Illinois Climate Action Plan (iCAP) 2020 was drafted as a result of hard work on the part of all involved. We would like to thank the hundreds of motivated individuals who generously dedicated their time, effort, and ideas along the way.

We would especially like to express appreciation for our passionate students, who have displayed nothing but steadfast conviction over the course of this drafting process. One challenge after another was met with energy, enthusiasm, and wisdom — we are not only immeasurably proud of our students, but proud to have witnessed such an astounding show of what it means to persevere.

The Alma Mater statue on our campus is inscribed with the familiar phrase, “To thy happy children of the future, those of the past send greetings.” This document is proof that today’s students have taken this kinship in hand, and are working toward a sustainable future for the classes of 2050 and beyond.

DRAFT

Introduction

For a century and a half, University of Illinois leadership has actively pursued the institution's mission "to enhance the lives of citizens in Illinois, across the nation and around the world."¹ In this challenging and innovative spirit, the Urbana-Champaign campus has spent the last dozen years vocally addressing one of modern society's most critical issues: sustainability.

In an era that recognizes the gravity of a growing climate emergency, the practice of meeting today's needs without compromising those of future generations is indispensable. Previous versions of the Illinois Climate Action Plan (iCAP) were published in 2010 and 2015. With this iteration, we aim to further our relentless pursuit of carbon neutrality while striving for holistic, campuswide sustainability and strengthening our community resilience.

Poised at the outset of a new decade, iCAP 2020 represents our continuous recommitment to environmental stewardship — to honor the work of the past and advance toward a safe and sustainable future.

Overview of Commitments

Scope of iCAP 2020

As the flagship institution of higher education in Illinois and one of the world's leading research institutes, we acknowledge the university's expansive scope of impact.

This document, published under the authority of Chancellor Robert J. Jones, pertains specifically to the contiguous Urbana campus and the facilities, resources, and personnel contained therein. See Chapter 7 for further discussion of on-campus Engagement objectives. Additionally, many of our Resilience objectives involve collaborations with local entities in Champaign, Urbana, and Savoy. For further discussion of these objectives, see Chapter 8.

Climate Leadership Commitment

iCAP 2020 is intended to outline a comprehensive approach to campus sustainability. However, the University's history of climate commitments began with an acute focus on the most destructive agent of climate change: greenhouse gas (GHG) emissions. In 2020, curtailing campuswide GHG emissions remains the cornerstone of our strategic plan.

On Feb. 22, 2008, Chancellor Richard Herman joined a cohort of higher education colleagues in signing the American College and University Presidents' Climate Commitment (ACUPCC). Later renamed the Second Nature Carbon Commitment for the sponsoring Boston nonprofit, this document — which accrued more than 600 signatories — formally solidified the U of I's dedication to achieving carbon neutrality as soon as possible and no later than 2050. The

¹ <https://illinois.edu/about/>

document, which called attention to the importance of cultivating an environmentally conscious student body, is excerpted below:

We believe colleges and universities must exercise leadership in their communities and throughout society by modeling ways to minimize global warming emissions, and by providing the knowledge and the educated graduates to achieve climate neutrality.

On Feb. 9, 2016, eight years after the signing of the ACUPCC, Interim Chancellor Barbara Wilson signed Second Nature's Climate Resilience Commitment, thereby pledging to work with community partners to evaluate local vulnerabilities to a changing climate as they pertain to natural resources, land management, and energy production.

The Resilience Commitment and Carbon Commitment combine to form Second Nature's full Climate Leadership Commitment, for which Illinois is a Charter Signatory Campus. In Fall 2019, University of Illinois President Timothy Killeen reinforced this commitment for all three University of Illinois campuses by signing onto the Climate Emergency Letter as one of more than 200 Global Universities and Colleges for the Climate.

Relationship to Other Commitments

In addition to those sponsored by Second Nature, the U of I's climate commitments are made public through several methods.

In 2011, the University joined the Billion Dollar Green Challenge, which was launched in October of the same year. Participating organizations are challenged to invest a total of \$1 billion in energy efficiency projects via self-managed revolving funds. The University's revolving fund is managed by Facilities & Services (F&S), and originally consisted of contributions from the Office of the Chancellor, the President's Office, and the Student Sustainability Committee (SSC). Projects funded in this manner are cost-effective as well as energy efficient, and utility cost savings are ultimately reabsorbed into the fund to ensure its longevity.²

In 2012, Chancellor Phyllis Wise committed the University of Illinois at Urbana-Champaign to become an LED Campus. Wise made this decision to honor Grainger College of Engineering alumnus and Emeritus Professor Nick Holonyak Jr., who is credited with demonstrating the first visible LED. The commitment called for a campuswide preference for LED lighting systems, in addition to the following two measurable objectives: 1) replacing interior and exterior wayfinding fixtures with LED fixtures by 2025; and 2) converting a majority of all lighting to LED by 2050.³ These targets remain a priority for the University, and are discussed with regard to the Energy SWATeam objectives in Chapter 2.

The University of Illinois at Urbana-Champaign became an Environmental Protection Agency (EPA) Green Power Partner in January 2015. The Green Power Partnership (GPP) initiative is a

² <http://greenbillion.org/participant/uiuc/>

³ <https://icap.sustainability.illinois.edu/project/led-campus>

19-year-old cohort with the goal to elevate the voluntary adoption of green power in the United States.⁴ For more information about the University's partnership, see Chapter 2.

In November 2015, Interim Chancellor Barbara Wilson signed the White House Act on Climate Pledge, reiterating Illinois' commitment to reaching carbon neutrality. An environmental sustainability component is also included in the University of Illinois System President's Guiding Principles, which calls for sustainable environmental and economic improvements to the human condition.⁵

Several other campus commitments are related to specific sustainability topics; they are described in the related chapters.

Progress to Date

Emissions 101

GHG = Greenhouse gas

CO₂ = Carbon dioxide

CO₂e = Carbon dioxide equivalent; we use this as a standard to express the impact of all GHG emissions in terms of CO₂

MTCO₂e = Metric tons of carbon dioxide equivalent

Carbon Emissions Inventory

As part of the Climate Leadership Commitments, Illinois publicly submits greenhouse gas emissions inventories to Second Nature on an annual basis. The first step in this process was conducting a campuswide carbon emissions inventory in FY08. The results of this inventory serve as "baseline" values that anchor the University's progress from FY08 to the present day, and to the target year of FY50.

As an institution that values knowledge and public information, we are committed to making our GHG reporting accessible and understandable to the public. It should therefore be noted that greenhouse gas emissions are reported in "metric tons of carbon dioxide (CO₂) equivalent"

⁴ <https://www.epa.gov/greenpower/green-power-partnership-program-overview>

⁵ https://www.uillinois.edu/about/guiding_principles

(MTCO₂e), a quantity that includes major GHGs (including methane, nitrous oxide, and others) appropriately adjusted for their climate impacts relative to CO₂.

GHG emissions are generally categorized into three “scopes”:

- Scope 1 consists of emissions resulting from on-campus activities over which we have direct control and the emissions that are physically produced on campus. This includes emissions from energy generation using fossil fuels at Abbott Power Plant, vehicle fuels for the campus fleet, and animal emissions from ACES.
- Scope 2 consists of emissions resulting from purchased electricity.
- Scope 3 consists of emissions that occur off campus as a direct result of campus activities (e.g., commuting, air travel, and electricity transmission and distribution loss).

The total campus emissions inventory for the base year of FY08 was 575,088.1 MTCO₂e.⁶ Approximately 85% of these directly result from the need to heat, cool, and operate campus buildings. Most of the energy produced for building operations comes from coal and natural gas combustion at Abbott Power Plant, and the remainder through purchases of electricity from outside sources. Other emissions sources on campus are found in transportation systems and patterns, agricultural emissions, water use, and solid waste.

As of June 30, 2019, the gross GHG emissions total on campus was calculated to be 433,797 MTCO₂e — roughly a 25% decrease as compared to the base year — broken down by scope as follows: 195,459 MTCO₂e for Scope 1; 183,595 MTCO₂e for Scope 2; and 54,743 MTCO₂e for Scope 3 (Figure 1).

⁶ <https://reporting.secdnature.org/institution/detail/1375##1375>

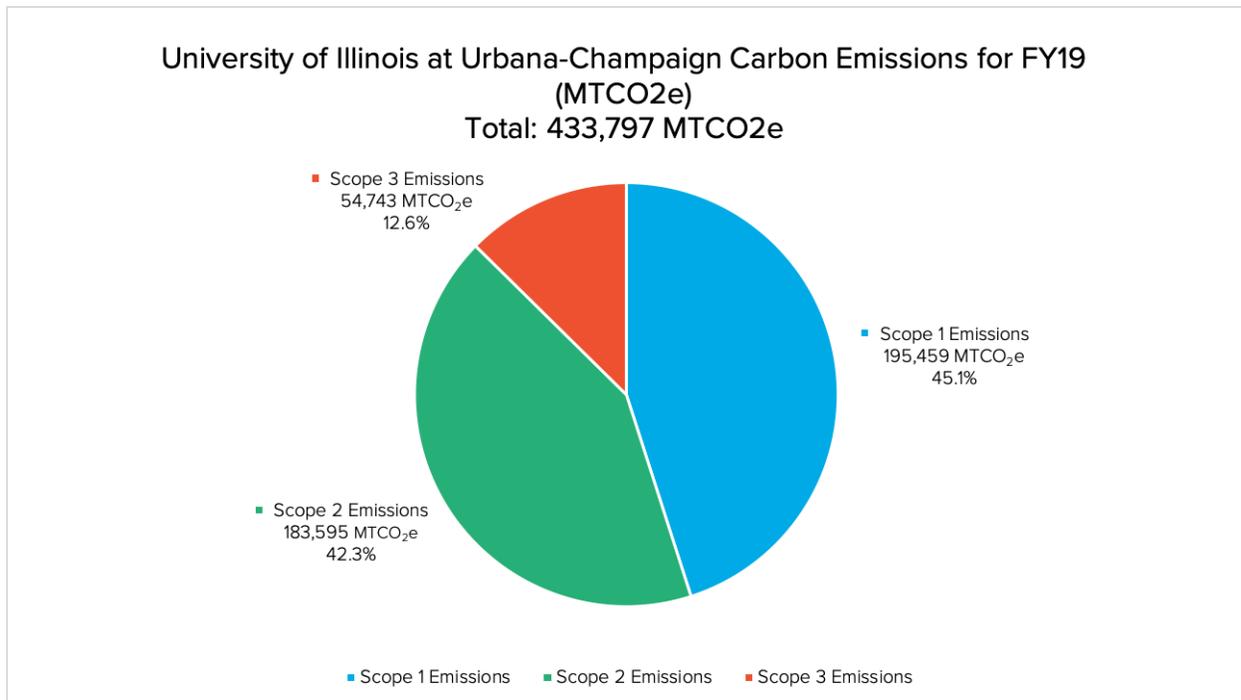


Figure 1: Gross Campus GHG Emissions for FY19

Historical Info

In addition to spurring the first campuswide GHG emissions inventory on campus, the signing of the 2008 commitment provided the impetus for the University’s first climate action plan with its charge to “initiate the development of a comprehensive plan to achieve carbon neutrality as soon as possible.” The 2010 iCAP served as the inaugural iteration of such a scaffolding from the University of Illinois, and it was also the first climate action plan submitted to Second Nature by a Big Ten university.

The 2010 plan set aggressive short- and long-term goals for achieving carbon neutrality on campus, with several core commitments ranging from energy conservation and renewable energy to planning and follow-through. Soon after, a website called the iCAP Portal was established to comprehensively track and share updates on campus sustainability progress. Proposed, in progress, ongoing, canceled, and completed projects are organized into primary themes: Energy, Transportation, Land and Water, Zero Waste, Resilience, Reporting Progress, Engagement, Education, Research, and Funding.

In late 2011, the Chancellor commenced the Visioning Future Excellence initiative, a collaborative process that gathered input from more than 3,000 individuals to identify the areas in which Illinois can best contribute to society’s most pressing needs. One of the themes that emerged from this process was “Energy and Environment.” In response to this, Illinois launched the Institute for Sustainability, Energy, and Environment (iSEE) in December 2013. Since its

conception, iSEE has strengthened its mission to “foster actionable, interdisciplinary research to address fundamental challenges in sustainability, energy and environment; to provide national and international leadership in these areas through interdisciplinary education and outreach activities; and to develop and implement strategies for a sustainable environment on the University of Illinois’ Urbana-Champaign campus and beyond.” This three-pronged approach in the themes of campus sustainability, education and outreach, and research sets Illinois apart from other universities with sustainability institutes, where the operational aspects are often greatly separated from the teaching and research aspects.

One of iSEE’s first major steps for integration of academics and operations in the sustainability arena was to develop a formal process for conceiving and recommending campus sustainability policies and initiatives. In June 2014, the Procedure for Formulating and Evaluating Campus Sustainability Policies and Initiatives⁷ was prepared in collaboration with Facilities & Services (F&S), the Office of the Vice Chancellor for Research, and the Office of the Provost, and was approved by the Chancellor. At the heart of this process was the creation of topical Sustainability Working Advisory Teams (SWATeams), each composed of student, faculty, and staff representatives. These multidisciplinary teams are charged with proposing new sustainability initiatives and studies, collaborating with community experts and stakeholders, and advocating for the university’s ongoing efforts toward holistic campus sustainability. The SWATeams bring faculty, students, and staff together in a unique collaborative environment, and this structure has been shared with other schools seeking to enhance their academic and operational interactions for improved sustainability. The SWATeams make recommendations to the iCAP Working Group, which evaluates the recommendations and routes them to the appropriate campus unit or to the Sustainability Council for further evaluation and implementation. The SWATeams and iCAP Working Group are charged annually by iSEE Baum Family Director Evan H. DeLucia. He is also the Vice Chair of the Sustainability Council, which is charged and chaired by the Chancellor.

Operational campus sustainability efforts are primarily implemented by Facilities & Services (F&S), currently under the leadership of F&S Executive Director Mohamed Attalla, who is also on the Sustainability Council. As the largest administrative unit, F&S has responsibility for sustainable transportation, resilient grounds and landscapes, waste management and recycling, large-scale renewable energy and energy conservation, rainwater management and green infrastructure, Leadership in Energy and Environmental Design (ILEED) certifications for capital construction, building maintenance and services, and more. F&S has been involved with the iCAP since the 2008 signing of the Climate Commitments and has integrated sustainability requirements into building standards, energy production, campus planning, and waste management. F&S employees are key members of five SWATeams, providing continuity and innovative solutions for the teams to consider along with the iSEE Associate Director for Campus Sustainability.

⁷ https://sustainability.illinois.edu/wp-content/uploads/2016/12/Campus_Sustainability_Procedures_Final.pdf

Other administrative units with staff in SWATeams or the iCAP Working Group (iWG) — and working on implementation of the iCAP — include University Housing, the Illini Union, the University Parking Department, Purchasing, and University of Illinois Extension. Student and faculty SWATeam members represent several colleges and academic units across campus. For a full list of SWATeam, iWG and Sustainability Council members and their affiliations, please visit Appendix C.

The SWATeams were heavily involved in the formation of the 2015 iCAP, which was drafted over the course of the 2014-15 academic year. After months of dedicated work and collaboration, the final version was signed by Interim Chancellor Barbara Wilson in October 2015.

For the development of iCAP 2020, new SWATeams were formed in FY20, including the Resilience SWATeam, which includes community representatives in addition to students, faculty, and staff.

iCAP Portal

Maintaining transparency regarding sustainability objectives, successes, and challenges is a high priority for our University. In 2012, we launched the [iCAP Portal](#),⁸ a real-time online platform that provides iCAP updates, historical context, metrics, and contact information for project leads. To date, the portal hosts data for more than 750 stored projects and tracks [95 data sets](#)⁹ corresponding to iCAP objectives and related projects. Encompassing a decade of valuable information, the public site serves as a repository, including proposed projects that have not yet been implemented, canceled projects that did not come to fruition, and active projects that are in development, complete, or ongoing. Each project includes a brief history, with some historical information going back as far as 2005. The iCAP Portal has about 17,000 visitors per year, and it serves as an excellent resource for several classes and independent student projects.

Recognition

In recent years, sustainability efforts at Illinois have been met with substantial recognition on a national scale. In January 2019, the Urbana-Champaign campus was named the ninth annual winner of the Climate Leadership Award, presented by Second Nature in conjunction with the U.S. Green Building Council. Illinois was specifically cited for its depth and breadth of sustainability, energy, and environmental research, as well as its comprehensive energy-saving efforts and educational programming in sustainability across curricula. Both of these topics are reflective of the significant numbers of students, faculty, and staff working together to achieve our climate commitments.

⁸ <https://icap.sustainability.illinois.edu/>

⁹ <https://icap.sustainability.illinois.edu/all-metrics>

Also in 2019, Illinois was awarded Gold Level honors in the Sustainability Tracking, Assessment & Rating System (STARS) for the fourth straight time. This rating was made possible by outstanding energy and resource savings work provided by Facilities & Services (F&S), as well as inclusion of sustainability across academic units. Significant innovations lauded in the report include the student-written environmental journal *Q Magazine*, the Field to Flame biomass boiler project at the Illinois Energy Farm, and the Student Sustainability Committee (SSC)-funded Inner Voices Social Issues Theater Project. As of recertification in March 2019, Illinois received the top STARS score among Big Ten Conference schools.

Illinois also ranked No. 20 out of 282 four-year higher education institutions in Sierra Club Magazine's "Cool Schools" contest in 2019. Campuses participate by completing an extensive questionnaire about their sustainability practices, which is then evaluated by a team of experts at the Sierra Club.

Additional accomplishments pertaining to the seven major themes of the iCAP are listed in the following chapters.

Organization of Plan

SWATeam Process

In addition to the above achievements, the last five years allowed us the opportunity to reassess our approach to campus sustainability and identify opportunities for innovation moving forward.

In Fall 2019, the Sustainability Working Advisory Teams (SWATeams) underwent a thorough reorganization according to a newly identified distribution of need. During the development of iCAP 2020, the six SWATeams were organized as follows: Energy; Land & Water; Zero Waste; Transportation; Education and Outreach; and Resilience. In addition to the typical combination of student, faculty, and staff members, the Resilience team uniquely includes representatives from local government and other pertinent entities. An iSEE intern serves each team as a "clerk." More detailed descriptions of the SWATeams' history and overarching goals are located in their respective chapters.

As in years prior, iCAP 2020 was developed as a result of collaborative efforts from an array of contributing entities and individuals. First, the SWATeams transmitted draft iCAP objectives to the iCAP Working Group (iWG). The iWG — which consists of midlevel administrators as well as faculty, staff, and student representatives — is charged with evaluating objectives proposed by the SWATeams, coordinating public input, and guiding iSEE in the drafting of each five-year document. Once the iWG approved the draft objectives from the SWATeams, iSEE sought public feedback prior to draft review by the Sustainability Council. Chancellor Jones gave the

document final approval. Appendix C lists the members of the SWATeams, iCAP Working Group, and Sustainability Council during the period in which this document was formulated.

Campus and Community Engagement

In drafting iCAP 2020, maximum participation was of paramount importance. We strove to not only make the iCAP known to and understood by its stakeholders, but to actively include these voices in the document's framework. As such, the iWG worked with iSEE staff and dedicated student iWG members to redouble outreach efforts and employ new methods to engage as wide a variety of voices as possible. These efforts included:

- Campus Sustainability Celebration Open Forum: This free, publicly accessible event took place during Campus Sustainability Week, on Oct. 23, 2019. Posters representing the six SWATeams were displayed throughout the room, and attendees were encouraged to add their constructive ideas to the corresponding category. The suggestions were subsequently passed to the SWATeams to assist with early stages of deliberation and strategic planning.
- Monthly Student Input Sessions: These sessions — on Nov. 6 and Dec. 6, 2019, and Feb. 3 and March 3, 2020 — targeted undergraduate and graduate students to facilitate idea generation and strategy development for each of the iCAP objectives. They were widely attended, with approximately 40 student participants at each event.
- Submission Form: To supplement the above in-person input sessions, iSEE's website hosted an online [iCAP Input Questionnaire](#)¹⁰ during the 2019-20 academic year. The questionnaire offered campus and community members the continuous opportunity to submit suggestions in a standardized format.
- Curricular Student Engagement: For the first portion of the Spring 2020 semester, iSEE offered NRES 285 as a Student iCAP course co-instructed by Campus Sustainability Programs Coordinator Meredith Moore and Academic Program Instructor/Advisor Eric Green. The course aimed to engage students in the development and presentation of the iCAP. At the end of this eight-week course, three student teams presented proposed iCAP objectives to stakeholder groups, including the iWG, which were well-received and incorporated in this document. Additionally, representatives from F&S, iSEE, and the iWG made presentations to undergraduate courses with the intent to raise awareness and cultivate interest in the iCAP among the student body, particularly underclassmen.
- Stakeholder Engagement - Sustainability staff presented the draft iCAP 2020 objectives to the Senate Committee on Campus Operations. iWG members also circulated the iCAP drafts to their affiliated groups.

¹⁰ <https://sustainability.illinois.edu/campus-sustainability/icap/>

- Virtual Outreach and Engagement Efforts: As of March 2020, outreach and engagement efforts pertaining to the iCAP drafting process were shifted to a digital format due to health concerns raised by the COVID-19 pandemic. All SWATeam, iWG, and stakeholder meetings were conducted virtually, as was the Sustainability Council meeting.

This iCAP was formed on the basis of cogent suggestions and spirited conversation. That said, we identified several channels through which to maintain connections with the Illinois community and provide opportunities for feedback.

Most notably, the April iCAP Celebration and Forum was transitioned to an entirely virtual format. This event, the sixth of its kind during the 2019-20 academic year, took place during Earth Week on April 23 through a combination of Zoom and Facebook Live. While the initial intent was to showcase and celebrate the iCAP draft and solicit feedback from students, faculty, staff, and stakeholders, the digital format prevented networking and celebratory aspects from being realized in full. Nevertheless, we received active engagement from campus and community members who tuned in to watch student SWATeam representatives present the iCAP draft objectives for their chapters.

Following the online presentation, the aforementioned iCAP submission form was adapted to welcome generalized thoughts and feedback on the objectives. The online form remained publicly available throughout the spring and summer of 2020, and submissions were reviewed by members of the iCAP drafting committee.

Despite the challenges and inevitable learning curve that often accompanies remote work — particularly in circumstances involving a large number of people, as was the case with iCAP 2020 — we are pleased that this process was able to continue, albeit unconventionally. The situation was not ideal, and we continue to remain humbled by the adaptability and determination demonstrated on the part of all involved.

iCAP 2020 Structure

As the third climate action plan published by the University of Illinois at Urbana-Champaign, iCAP 2020 is both an update and revision to previous iterations published in 2010 and 2015.

The following chapters are each organized into three segments: an introduction with overarching concepts for each topic; specific objectives with explanations, key performance metrics, and a unit or units responsible for progress toward the objectives; and a conclusion.

Objectives represent the core strategy of the iCAP. They are defined to be specific, measurable, achievable, relevant, and time-bound. The Sustainability Council and the iCAP Working Group (iWG), in collaboration with the responsible units listed for each objective, will measure and report progress and work with campus and budgetary authorities to identify funding to

implement them in a timely manner. The explanations of each objective outline methods that the campus can consider to aid in achieving the objectives, as well as potential issues that may need to be addressed.

Annually, the SWATeams and the iWG review progress on the iCAP objectives and make recommendations for additional actions campus units should take toward meeting these. The SWATeam recommendations might pull from the strategies described in this document, or they might include new strategies as circumstances evolve.

Chapters 2-9 present objectives for eight topical areas: Energy, Transportation, Land & Water, Zero Waste, Education, Engagement, Resilience, and Implementation. While Engagement was not an officially charged SWATeam in FY20, the importance of targeted outreach and engagement efforts on campus warrant a chapter and an Engagement SWATeam was launched in FY21. Chapter 9 discusses implementation considerations including a table listing funding levels, responsible parties, and level of difficulty for each objective. Chapter 10 offers concluding remarks.

With the approval of this 2020 version of the Illinois Climate Action Plan, we make an enhanced commitment to environmental sustainability and proudly recognize the leadership role the University plays in modeling strategies to ensure a sustainable future.

DRAFT

Chapter 2: Energy

Campus Energy 101

Energy stewardship is one of the most nuanced and technical aspects of campus sustainability. The following definitions of commonly used terms, phrases, and metric units can provide clarification throughout the chapter.

Energy – The overall energy system for our campus includes a district heating system, which delivers steam to campus buildings, and a district cooling system, which delivers chilled water to campus buildings. Abbott Power Plant is a combined heat and power plant that generates steam and electricity for the Urbana campus. The Campus Chilled Water System (CCWS)¹¹ comprises a group of chiller plants used to generate chilled water for campus air conditioning; the system also includes a 6.5 million-gallon Thermal Energy Storage (TES) tank, which can produce chilled water during low-cost periods and use it later during peak cooling times. The campus also has a connection to the regional Ameren grid, and the University is a direct market participant in Midcontinent Independent System Operator (MISO) for electric power distribution.

Energy Use Intensity (EUI) – This reflects the amount of energy needed for different spaces, expressed as the total energy consumed by a space divided by the total square footage of that space. On campus, we measure EUI for individual buildings and for the campus as a whole as total energy (BTU) divided by gross square feet (GSF).

Clean Energy – This refers to energy from sources with no or low net carbon emissions. These include renewable sources such as solar panels and wind turbines, as well as low-carbon energy sources such as nuclear and biomass. As described in the 2015 iCAP, renewable energy does include power that is associated with equivalent renewable energy certificates.

Renewable Energy Certificate (REC) – This system records and tracks the generation and use of renewable energy. One Renewable Energy Certificate is generated for each megawatt-hour of renewable electricity generated and put on the electric grid.

Power Purchase Agreement (PPA) – This refers to a contractual agreement for power, often used for procurement of renewable or clean energy. A physical PPA includes delivery of the purchased power to the campus grid. A virtual PPA (VPPA) is a contract that uses a financial transaction and does not include the physical delivery of power to campus.

¹¹ https://fs.illinois.edu/docs/default-source/utilities-energy/campus-chilled-water-system.pdf?sfvrsn=c91bfbea_0

Megawatt (MW) = 1,000,000 Watts

Megawatt-hour (MWh) = one hour of production at megawatt scale = 1,000,000 Watt-hours

British Thermal Unit (BTU) = 1.055.06 Joules

MMBTU = 1,000,000 BTUs = 1,000 KBTUs

Introduction

The University of Illinois at Urbana-Champaign main campus includes all University-owned property located within the University District and on the South Farms. Each year, campus uses approximately 3 trillion BTUs (or 3.2 quadrillion joules) of energy,¹² enough to sustain 39,000 U.S. homes.¹³

Illinois leads the Big Ten in terms of overall energy efficiency, or Energy Use Intensity (EUI), measured in terms of BTU per gross square foot (GSF), and we are proud that our energy usage and expenditures are lower than average among Big Ten institutions according to Sightlines, LLC.¹⁴ Nevertheless, our energy consumption — the steam and electricity generated on campus added to the electricity purchased from off campus — remains the greatest contributor to our total greenhouse gas (GHG) emissions. Campus energy emissions are reflected in Scope 1 and Scope 2 of our total GHG inventory. In the FY19 inventory, energy emissions totaled 381,069 MTCO₂e, comprising roughly 86% of the total gross emissions by our campus in the same year.¹⁵

The campus aims to reduce energy emissions through a two-pronged approach: combining proactive energy efficiency strategies with continuous efforts to procure energy from clean sources. As highlighted in the [Energy Use Policy](#),¹⁶ the 2010 iCAP, and the 2015 iCAP, energy efficiency and cost-saving energy conservation projects have served as cornerstones of our campus sustainability strategy. A particular challenge for the University in this area involves improving space utilization. In Fall 2019, the Urbana-Champaign campus welcomed an unprecedented 50,000 new and returning students. We are proud of our status as an evolving and growing institution, and as we continue to grow and evolve over the next 150 years, we must balance the need for student and academic facilities with the competing obligation to enhance our energy efficiency.

¹² F&S Utilities and Energy Services data

¹³ In 2015, the average American home used 77 million BTUs per year. Source: <https://www.eia.gov/energyexplained/use-of-energy/homes.php>

¹⁴ Sightlines, LLC, is a consultant that provides facility and services data analysis to colleges and universities across the nation, including the Big Ten institutions.

¹⁵ <http://reporting.secdnature.org/institution/detail/1375##1375>

¹⁶ https://fs.illinois.edu/docs/default-source/utilities-energy/energyusepolicy.pdf?sfvrsn=b717c0ea_2

University expansion is not the only future scenario to which we must adapt: with social, economic, and lifestyle changes a consequence of the COVID-19 pandemic, the campus must prepare not just for possible growth, but perhaps to occupy a smaller footprint. The state budget for higher education is likely to take a big hit, and consequential campus energy savings may make a welcome contribution to a tightened budget.

Essential to our pursuit of clean energy is our departure from fossil fuels. To that effect, the campus has been a proud member of the [Environmental Protection Agency's Green Power Partnership](#) since January 2015. As a Green Power Partner, Illinois joins more than 1,500 other universities, governments, business, and communities in a push toward using "green power."¹⁷ As of FY19, 7.3% of the total electricity used on campus is from solar and wind energy sources (see Objective #2.3.1).¹⁸

Notable achievements in energy efficiency and clean energy from 2015 to 2019 include:

- Solar Farm 1.0 has been operational since Dec. 11, 2015. The 20.8-acre farm is one of the largest university solar arrays in the U.S. and generates 2% of the campus's annual electrical demand. The Solar Farm is operated by Phoenix Solar South Farms, LLC, with whom Facilities & Services holds a 10-year power purchase agreement (PPA). All of the power generated by Solar Farm 1.0 and all of the associated Renewable Energy Certificates (RECs) are used by campus.¹⁹
- In November 2016, the University entered into a 10-year PPA with the Illinois-based Rail Splitter Wind Farm, LLC, for approximately 25,000 MWh/year, through Prairieland Energy, Inc. The campus receives the physical power and the associated RECs for 8.6% of the wind farm production. We receive the power whenever the wind is blowing, which is not always aligned with the timing of our power demand. Hourly wind purchases through this PPA are reported monthly on the iCAP Portal.²⁰
- In Fall 2019, the Board of Trustees approved construction of [Solar Farm 2.0](#).²¹ This 54-acre site will nearly triple the university's on-location solar energy generation, producing 20,000 megawatt-hours (MWh) annually in addition to the 7,000 MWh/year from Solar Farm 1.0. The new solar farm will also feature pollinator-friendly plantings which will make it a demonstration site as a Pollinator Friendly Solar Array.²²

17 <https://www.epa.gov/greenpower/what-green-power>

18 The Green Power Partnership reflects only power consumption, not total energy. Power on campus is only 38% of the total energy usage. Also, it should be noted that the Green Power Partnership only includes the green power purchases that are specifically obtained for our campus and does not include clean energy from the conventional grid purchased power.

19 <https://icap.sustainability.illinois.edu/project/solar-farm-10>

20 <https://icap.sustainability.illinois.edu/project/wind-power-purchase-agreement-ppa>

21 <https://fs.illinois.edu/services/utilities-energy/production/solar-farms>

22 <http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=3900&ChapterID=44>

- Geothermal energy systems are being installed at various U of I sites to offset thermal energy use from other sources. Shallow, horizontal ground loop systems have been installed at the Woody Perennial Polyculture (WPP) Research Site,²³ Allerton Park,²⁴ and for Gable Home at the Energy Farm. Closed loop geothermal energy systems containing a series of 400–500 deep vertical wells are installed at the Grainger College of Engineering’s Campus Instructional Facility (CIF)²⁵ as well as a greenhouse in the Research Park supporting the Realizing Increased Photosynthetic Efficiency (RIPE)²⁶ project. Drilled shafts constructed for the foundation of the Department of Civil and Environmental Engineering’s Ven Te Chow Hydrosystems Laboratory²⁷ are outfitted with a closed loop geothermal energy system.²⁸
- Retrocommissioning (RCx) optimizes a building’s heating, ventilation, and cooling systems and controls to maximize energy savings while maintaining occupant comfort. Since August of 2007, RCx teams have updated and upgraded systems in over 80 campus buildings, reducing energy consumption by an average of 27% and avoiding \$60M in utility costs for more than 10 million GSF of facilities.
- Centralized energy conservation efforts led by F&S, including Energy Performance Contracting, RCx and Recommissioning teams, upgraded boilers at Abbott Power Plant, and strong energy efficiency standards for capital projects have reduced the campus Energy Use Intensity in FY19 by 38.2% compared to the FY08 baseline. Buildings with the best energy efficiency improvements each year (compared to their previous year’s energy usage) are recognized through the Energy Conservation Incentive Program (ECIP).²⁹

In addition to the above achievements, the university increased outreach efforts and “behavior-change” campaigns pertaining to energy conservation in recent years. These efforts include:

- Eco-Olympics is a three-week energy savings competition that educates and motivates students to reduce energy usage in University Housing residence halls. In 2019, 350 students across 17 residence halls saved 70,000 kWh of energy.³⁰
- [Illini Lights Out \(ILO\)](#)³¹ is a student-run effort to conserve energy by switching off lights in university buildings. The effort began in Spring 2016 as a one-off event organized by the

²³ <https://icap.sustainability.illinois.edu/project/woody-perennial-polyculture-wpp-research-site>

²⁴ <https://icap.sustainability.illinois.edu/project/geothermal-allerton-park>

²⁵ <https://icap.sustainability.illinois.edu/project/campus-instructional-facility-cif-geothermal>

²⁶ <https://ripe.illinois.edu/>

²⁷ <https://icap.sustainability.illinois.edu/project/cee-hydrosystems-energy-lab-geothermal>

²⁸ <https://sustainability.illinois.edu/research/campus-as-a-living-laboratory-research-campus-sustainability-working-together/>

²⁹ <https://fs.illinois.edu/services/utilities-energy/energy-conservation/ecip>

³⁰ <https://buildingos.com/s/illinoisurbanachampaign/storyboard217/?chapterId=864>

³¹ <https://sustainability.illinois.edu/actions/initiatives/illini-lights-out/>

Energy SWATeam; in Fall 2019 alone, volunteers turned off more than 32,000 lightbulbs, saved over \$8,000 in utility costs, and conserved 55,000 kWh of energy.

- Illinois competed in the International Laboratory Freezer Challenge for the past three years, winning first prize in 2018 and 2019. This challenge encourages research-focused universities to reduce the environmental impact of their labs by optimizing equipment, maximizing space, and eliminating unnecessary freezers. In 2019, 70 laboratories across 15 buildings were enrolled in the program: overall, total energy usage decreased by an estimated 438 kWh/day, or a combined annual equivalent of 13.5 homes' energy use for one year.³²

We are proud of our students, faculty, and staff for spearheading the programs outlined above; at the same time, we acknowledge the continued need for a cultural shift and increased consciousness of energy efficiency and conservation practices on our campus.

In Fall 2018, University of Illinois Assistant Professor of Agricultural and Consumer Economics (ACE) Erica Myers and ACE Ph.D. Candidate Mateus Souza [conducted a study to gauge whether detailed energy reports would influence student energy-saving behaviors](#).³³ The project received funding through the Levenick iSEE Fellows Program, and ultimately determined that although similar experiments had proven effective in residential settings, the impact was negligible in residence halls. Moving forward, we hope to continue our efforts to engage students through a combination of specialized and focused events and ongoing sustainable behavior change campaigns.

In recent years, campus has made initial strides, such as Solar Farms 1.0 and 2.0 and the Rail Splitter Wind Farm PPA, in the transition to using renewable energy sources. There is, however, a long path ahead for both our campus and the world, and we plan to do our part by expanding our own use of clean energy options.

Energy Objectives

The following Energy objectives were developed by the SWATeams, iCAP Working Group, campus community, and Sustainability Council to guide the University's actions in the coming years toward improved energy efficiency and clean energy procurement.

2.1 Energy Planning Document

2.2 Increase Energy Efficiency

2.2.1 Improve Space Utilization

2.2.2 Reduce Building-level Energy

³² <https://fs.illinois.edu/resources/announcements/2019/08/08/the-university-of-illinois-wins-the-international-freezer-challenge-for-the-second-straight-year>

³³ <https://sustainability.illinois.edu/levenick-funded-research-explores-how-visual-energy-bills-impact-student-energy-consumption/>

2.3 Clean Energy Sources

2.3.1 140,000 MWh/year Clean Power

2.3.2 Clean Thermal Energy

2.3.3 Convert to Hot-water Heating

#2.1 [F&S] By FY24, develop a comprehensive energy planning document that includes a detailed strategy for meeting the FY50 net-zero greenhouse gas (GHG) emissions goal.

Over the last decade, the University's energy accomplishments were implemented primarily through incrementalism; when opportunities arose, dedicated staff worked hard to push through an improvement. Because this implementation style lacks systematic approaches, it cannot achieve the urgent changes needed at the rate required to meet our commitments. Reaching carbon neutrality for our energy needs will require significant funding, holistic energy conservation strategies, and clear prioritization of competing needs; therefore, a comprehensive energy planning document is necessary to keep campus energy use consistently on track to meet our FY50 goal.

This planning document will provide a one-stop-shop for clear, well-organized, and transparent baseline statistics (i.e., meter-by-meter power consumption, short-term and long-term trends, etc.), and make them readily available to all stakeholders. It will also include comprehensive and realistic estimates for future energy supplies from solar, wind, geothermal, and other low-carbon sources, such as nuclear. By performing comprehensive feasibility assessments for several potential clean energy sources at the same time, the document can propose the most efficient plan to achieve our FY50 goals (i.e., land allocation, balance of energy storage/production, daily/seasonal peak attenuation, etc.) and avoid repeating efforts over the next several decades as leaders, employees, working groups, and SWATeam members change. Campus can refer to the baseline metrics to gauge our performance over the next 30 years, and make adjustments as needed.

Because the staged energy infrastructure improvements will include cost estimates allocated for design, permitting, construction, operations, and maintenance for each proposed project, this document will also serve as a financial plan. University administrators can earmark funds now for projects that will be completed one, five, 10, or 20 years in the future in order to stay on track to meet our iCAP net-zero emissions goal by FY50.

The University's new energy planning document will be created through a Capital Programs "Feasibility Study" led by an engineering firm hired through a competitive Request for Proposals (RFP) or Quality Based Select (QBS) process. The report will include: lifecycle cost analyses to evaluate sustainable energy strategies; interim milestones to anchor progress toward FY50; a set of realistic goals for conservation, fossil fuel reduction, and increased implementation of clean energy; and a detailed funding plan with specific implementation costs for each strategy and the anticipated funding source.

With each rendition of the iCAP, we strive to advance our progress toward carbon neutrality and continuously improve our strategies. After completion of the planning document in FY24, we will use the results to inform the development of more specific iCAP 2025 energy objectives.

#2.2 [F&S] Reduce Energy Use Intensity (EUI) of University facilities from the FY08 baseline by: 45% by FY30, 50% by FY40, and 60% by FY50.

The reductions in Energy Use Intensity (EUI) on campus in the past decade are substantial — improving 38.2% from 303,649 BTU/GSF in FY08 to just 187,656 BTU/GSF in FY19 (Figure 2). These figures are calculated by starting with the total energy inputs for campus (i.e., fuels purchased for Abbott Power Plant and electricity purchased from the regional grid) and subtracting energy for non-campus facilities such as Willard Airport. Another noteworthy exception is the National Petascale Computing Facility (Petascale), which is a unique grant-funded collaboration with the National Science Foundation (NSF). The resultant campus energy use is then normalized against the total campus square footage for the annual EUI.

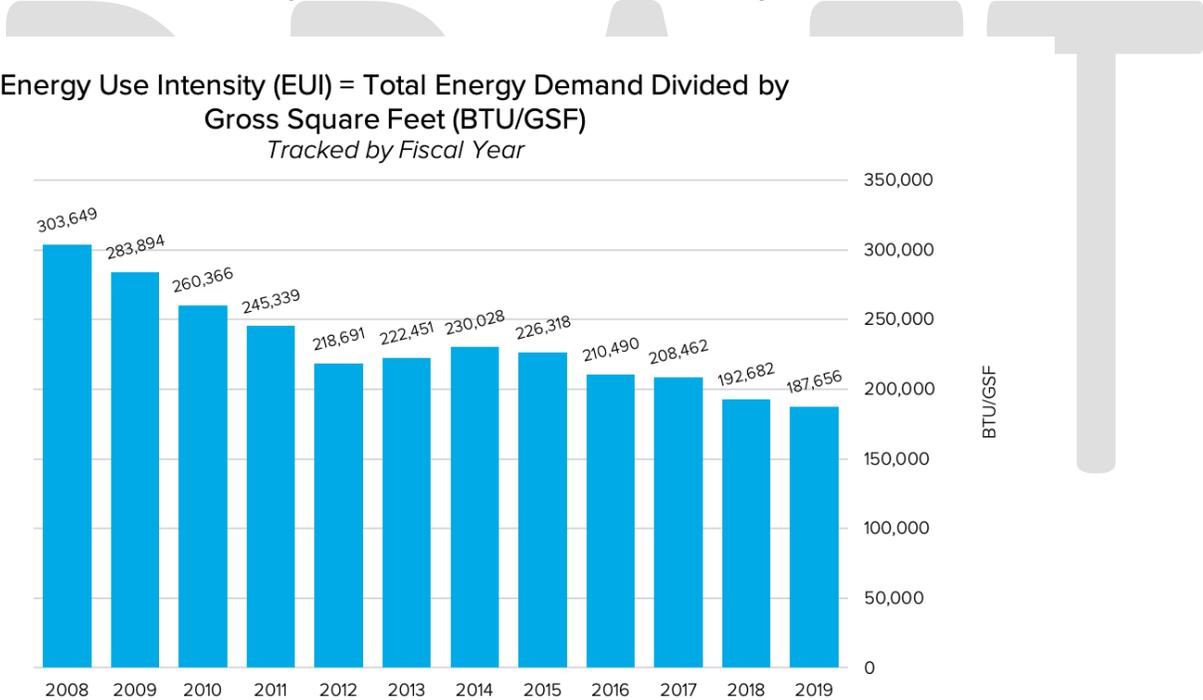


Figure 2: Annual Campus Energy Use Intensity (EUI)

Percent Reduction in Energy Use Intensity (EUI) = Total Energy Demand Divided by Gross Square Feet (BTU/GSF)
Tracked by Fiscal Year

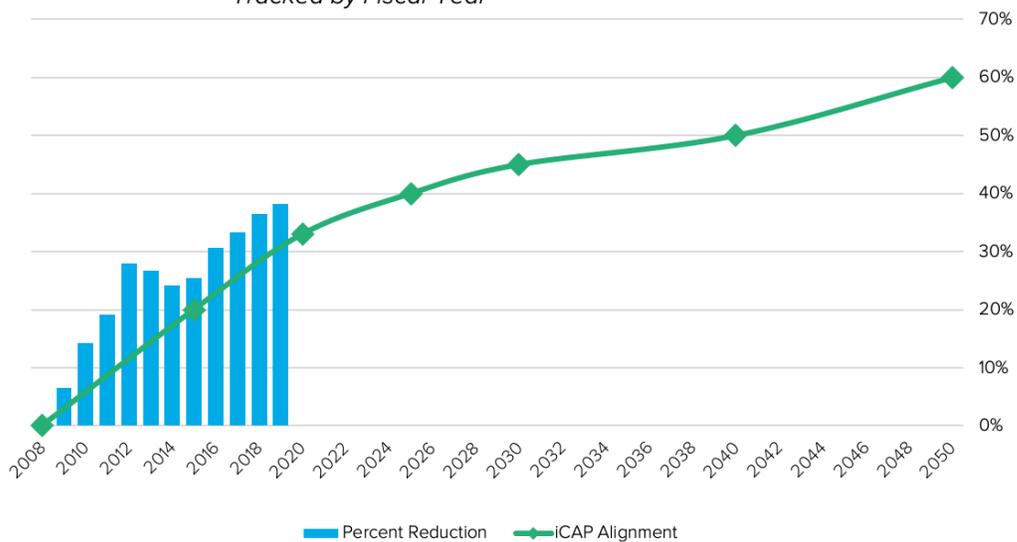


Figure 3: Target Reduction of Campus EUI

This objective seeks to continue our pattern of EUI reduction into FY50 (Figure 3). Several existing programs to reduce our campus EUI are underway — and these programs need to be continued, supported, and expanded. Specifically, we should continue to implement Energy Performance Contracting, Retrocommissioning (RCx), Recommissioning, and the LED Campus commitment (see “Relationship to Other Commitments” in Introduction).

To leverage the full extent of our resources toward EUI reduction, additional centralized energy efficiency programs should also be emphasized and strengthened. Several of these solutions are expounded upon in the following paragraphs.

Continuation of Major Energy Conservation Initiatives

As described in the notable achievements listed in the Introduction, there are several successful energy conservation initiatives managed through F&S. These include Retrocommissioning (RCx), Energy Performance Contracting, Recommissioning, and the LED Campus initiative. To date, these have proven to be the most effective means of reducing energy consumption in campus buildings. The following ideas can be considered as options for expanding the impact of these major energy conservation initiatives.

- Expand RCx efforts in auxiliary buildings, including University Housing, Campus Recreation, and the Division of Intercollegiate Athletics facilities. Currently, RCx efforts at F&S are limited to state-supported facilities by budget policies. The few auxiliary

facilities that have separately funded a RCx project prove that there is a great opportunity for improvement in the auxiliary buildings.

- Identify funding for more deferred maintenance projects, and prioritize projects with an energy efficiency component. Insufficient funding of deferred maintenance means more dollars must be directed to reactive maintenance — applying temporary fixes — rather than implementing the more cost-effective solutions of planned and preventive maintenance, including systematic renovation and renewal programs to upgrade facilities.
- Allocate campus funds to directly launch additional Energy Performance Contracts and grow the RCx program.

Energy Codes and Energy Cost Budgets

The Facilities Standards³⁴ require that new buildings constructed on campus meet strong energy performance standards and are LEED Silver certified at minimum. (Figure 4 provides a yearly overview of LEED-certified square footage on campus.) For new campus and auxiliary buildings, major retrofits requiring energy code compliance, and buildings in design, respective project teams will be required to provide electronic input files for Energy Cost Budget (ECB) energy modeling and energy performance modeling using conventional programs. Ensuring energy code compliance will necessitate proper staffing levels for the Capital Programs, Design Review, and Commissioning and Inspection departments at F&S.

Using the information collected from capital projects, faculty and researchers on campus could work with F&S to develop a reference database of calibrated energy models for campus buildings. This could potentially be the product of student classroom projects. The campus could then use the calibrated energy models to prioritize building retrofits and to determine the preferred level of improvements (envelope versus mechanicals) for each building.

³⁴ <https://fs.illinois.edu/resources/facilities-standards>

LEED-Certified Square Footage Each Year Tracked by Fiscal Year

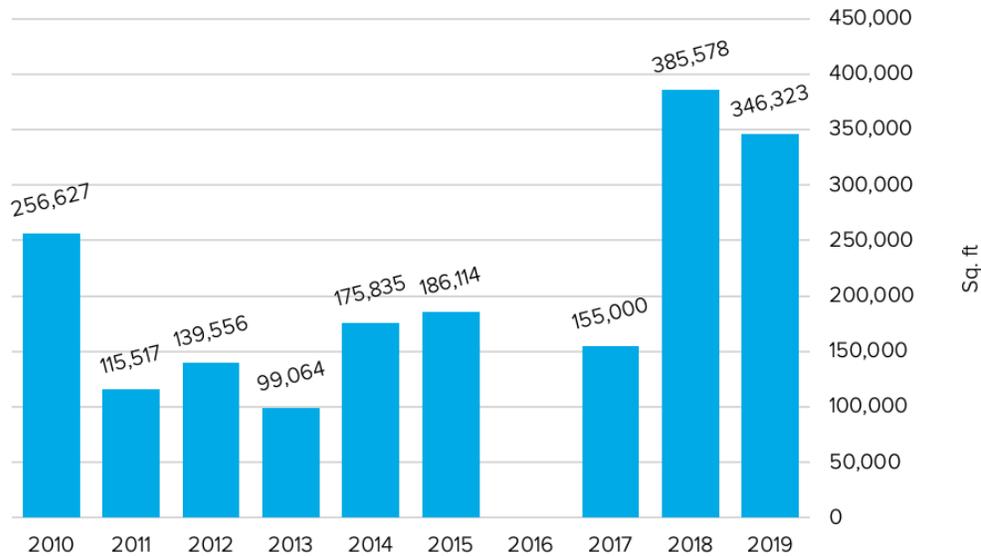


Figure 4: LEED-Certified Square Footage Added to Campus

Building Envelope Retrofits

As an additional effort, we should apply building envelope retrofits (which separate the renovated versus non-renovated areas in a building) to an increased number of campus buildings. While significant progress in enhancing heating, ventilation, and air-conditioning (HVAC) systems is underway, there has been little work focused on building envelopes. We should develop internal campus expertise in building envelope retrofits. F&S capital programs planners should consider Building Envelope Commissioning (BEC) and mechanical commissioning (and recommissioning if necessary) for major building projects.

Reduce Peak Consumption

Lastly, we need to work to reduce peak electricity consumption. A potential target is to reduce peak demand by 20% over the next five years. Electrical demand is highly related to the daily uses of a building, with a daily peak occurring at the time of highest occupancy. This is nicely illustrated by the energy dashboard weekly display from the Business Instructional Facility (BIF) at the start of spring break 2020 (Figure 5).³⁵

Peak electricity consumption occurs roughly in the middle of the day — the time when the highest volume of students, faculty, and staff are occupying the space. The graph reflects that

³⁵ <https://icap.sustainability.illinois.edu/project-update/compare-power-consumption-bif-during-spring-break>

on Thursday, March 12, and Friday, March 13, students were beginning to leave campus as a result of the upcoming break as well as preliminary course cancellations due to COVID-19. Saturday, Sunday, and Monday thus experienced drastically reduced electricity usage as compared with the week prior.

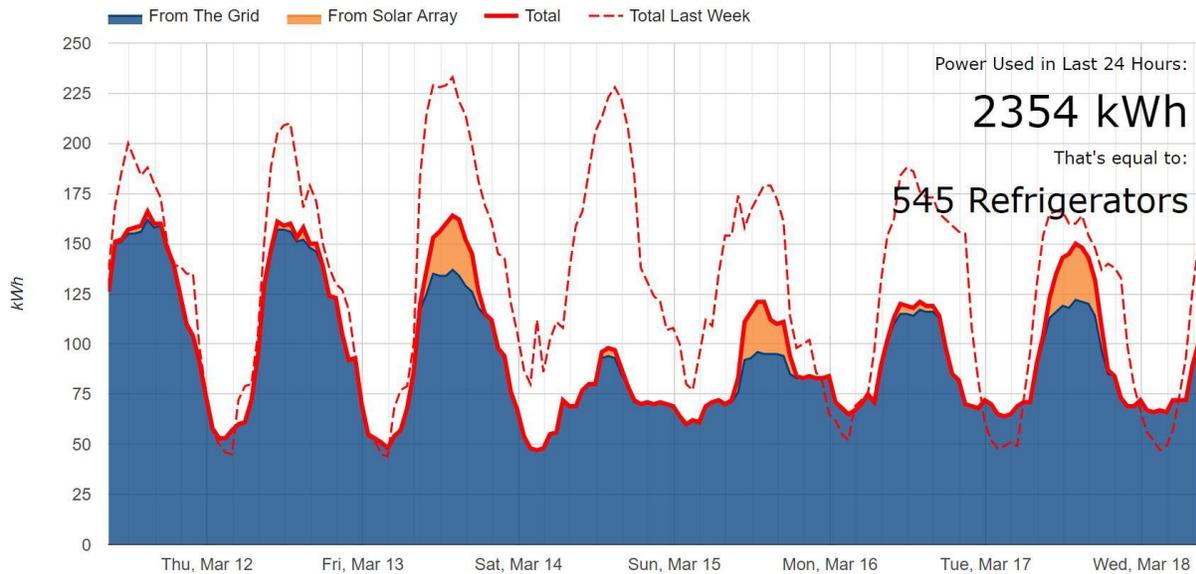


Figure 5: Energy Dashboard Weekly Display from the Business Instructional Facility (BIF)

In FY19, campus used a total of 457.31 million KWh of electricity (Figure 6). Reducing the peak demand for campus can happen through increased efficiency, changing campus schedules to flatten the peak throughout the day as opposed to concentrated at one time, or a combination of the two.

Total Campus Electricity Usage (kWh)
Tracked by Fiscal Year

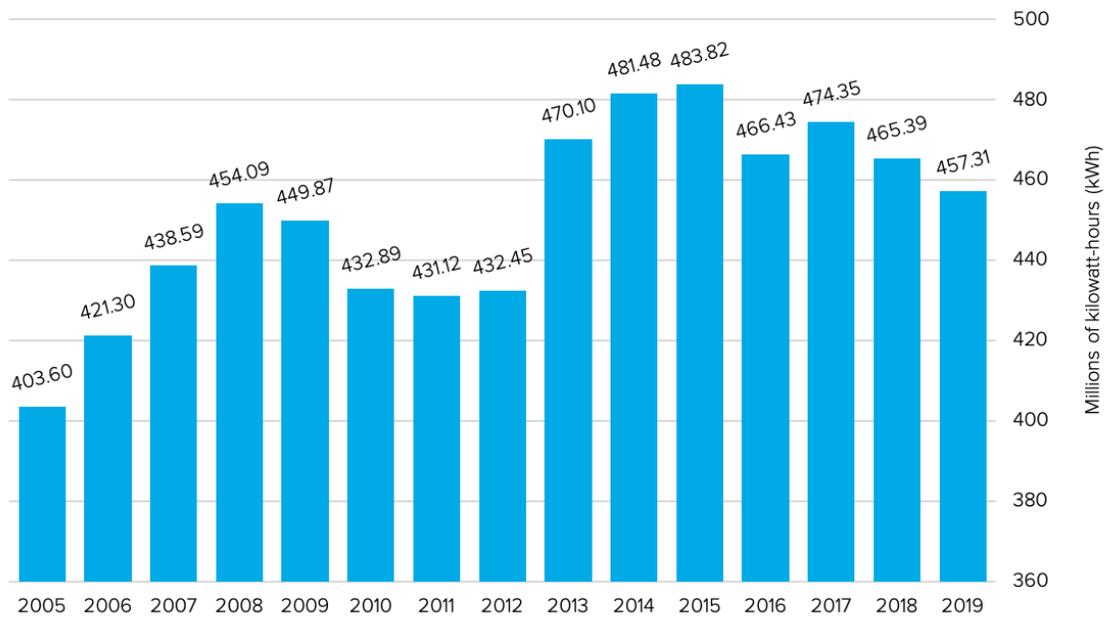


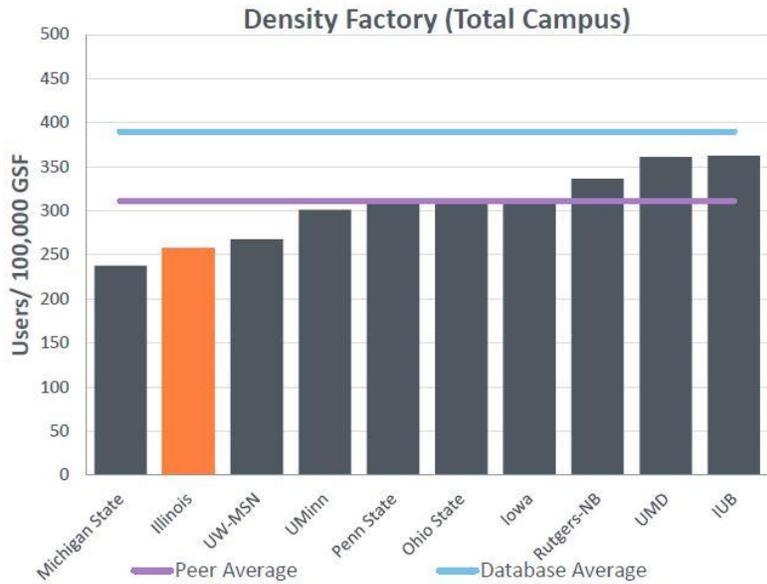
Figure 6: Total Campus Electricity Usage

#2.2.1 [Provost Office] Improve efficiency of space use by minimizing the square footage per person and updating the Space Policy in the Campus Administrative Manual (CAM) by FY23.

Because building space is intrinsically linked to energy demand, careful stewardship of campus square footage is a vital component of our ongoing GHG reduction strategy. Likewise, a clear understanding of the anticipated growth or reduction of building square footage is needed for developing an effective energy plan.

In comparison to other Big Ten universities, Illinois has low space use efficiency as reported by Sightlines, LLC.³⁶ Figure 7 shows the density factor for our campus in relation to our peers. Density represents how efficiently we use our space; clearly, there is room for improvement.

³⁶ Sightlines ROPA+ University of Illinois at Urbana-Champaign, FY18



Density Factor: Total Users (Students, Faculty, and Staff) per 100,000 GSF, including all State Aided, Auxiliary and Housing space that users occupy.

Figure 7: Campus Density Factor in Relation to Peers

To improve our space use efficiency, we need to increase space utilization rates, remove outdated and unneeded spaces, and actively restrict growth in the campus total gross square footage (GSF). Increasing space utilization rates can include clarifying and communicating policies regarding appropriate space allocations for various room categories, and implementing innovative space use solutions such as hot-desking. Removing unneeded spaces can include renovations or demolitions. The 2017 update to the Campus Master Plan identified specific buildings that should be demolished.

Efforts to actively restrict growth in the campus total GSF started with the 2010 iCAP commitment to enact a “no net increase in space” policy. The Net Zero Space Growth policy in the CAM (FO-44)³⁷ was established in June 2015, and since its inception, both the 2017 Campus Master Plan Update and the Integrated and Value-Centered Budget (IVCB) reform were implemented. The Campus Master Plan defined campus plans for the next 10 years, with only a 1.5% growth in GSF. Concurrently, the IVCB updates to the budgeting system transitioned energy and space costs from the somewhat hidden responsibility of the Provost and F&S, to a clear and direct cost for the academic colleges and administrative units. Additionally, the Office of the Provost has worked with the Council of Deans and other campus leaders to seek solutions for the outstanding deferred maintenance needs throughout the Illinois facilities.

A complete halt to growth cannot be sustained indefinitely. Solving global issues and teaching our future alumni will, at times, require growth beyond the current GSF. It is important for any

³⁷ <https://cam-illinois.edu/policies/fo-44/>

necessary future increases in GSF to have careful and considerate thought put toward the stewardship of both our space and our campus resources, always keeping an eye on our climate commitment.

Therefore, the Provost Office will work over the next few years to update the CAM space policy, with additional clarity about how to address the tension between an inherent need to grow as an institution and the need to limit our GSF. This will result in an environmentally sustainable space stewardship program that holds University administration accountable to maintain the highest standards of space use efficiency while including a review and approval process to control growth and continually reduce emissions.

#2.2.2 [Facility Managers w/F&S] Reduce the total annual energy consumption of each college-level unit by at least 20% from the FY08 baseline by FY30.

Over the last few years, the Energy SWATeam completed an extensive analysis of the total actual energy consumption of every University-owned building within the University District, using data from the Energy Billing System between 2009 and 2018 (Figure 8).³⁸

³⁸ <https://fs.illinois.edu/services/utilities-energy/business-operations/energy-billing-system>

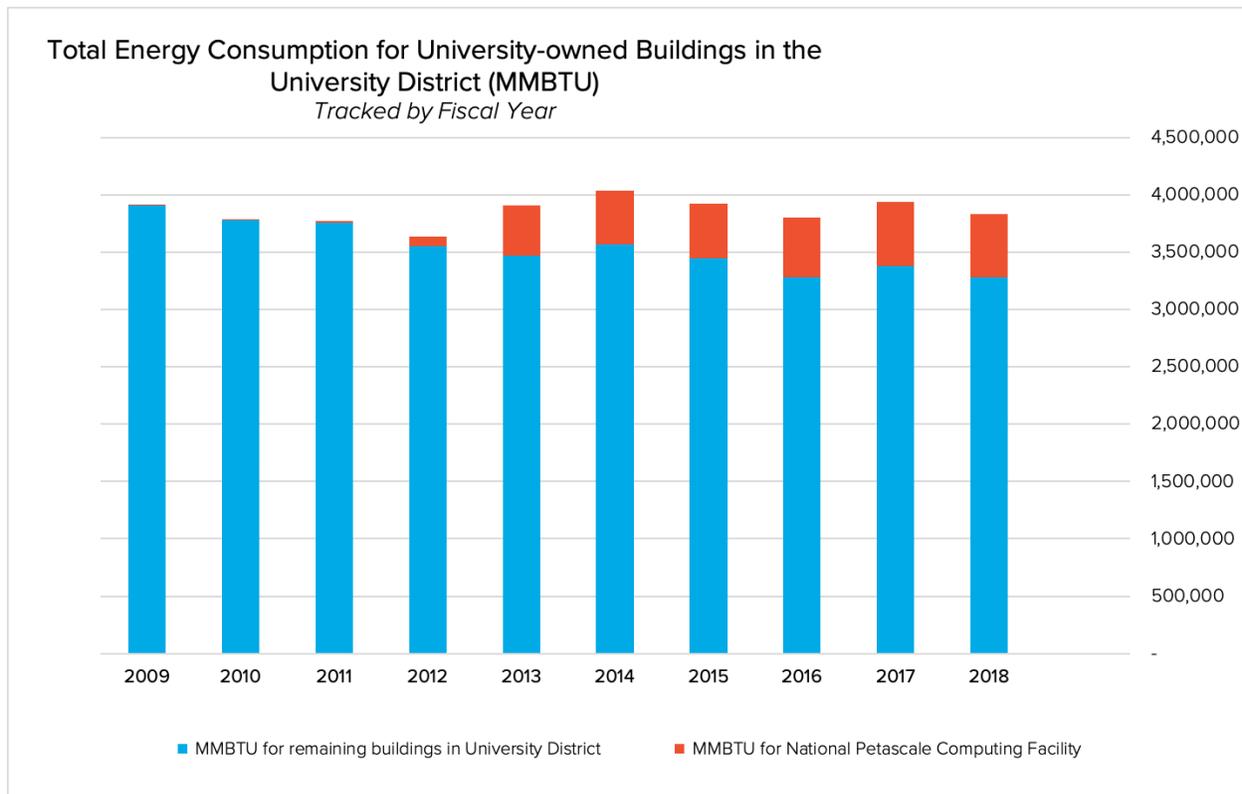


Figure 8: Total Energy Consumption for University-owned Buildings in the University-owned District

Unfortunately, total energy consumption (when not normalized by square footage) increased by 2% from FY08 to FY18. This is influenced by both an increase in University District square footage — which grew by 11% over this 10-year period (Figure 9) — and by the addition of Petascale, which used 724,017 MMBTUs in FY19 and did not exist in FY08. (See Figure 10 for Petascale’s total electrical consumption.) According to Energy SWATeam co-chair Bill Rose:

“Energy conservation [efforts] in the last 10 years have been wondrously successful — if left on their own, then the conservation goals could be easily met. Without the square footage burden and Petascale burden, it’s been really successful. But when we add the new square footage and Petascale, the total campus load is up, not down.”

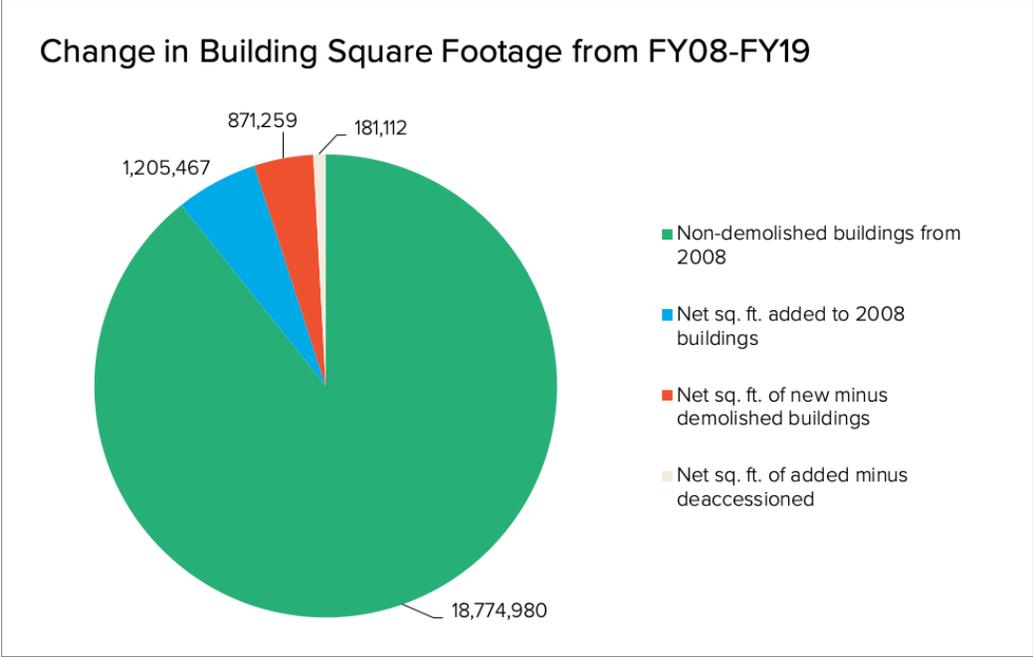


Figure 9: Square Footage of University-owned Buildings

Annual Electrical Consumption for Petascale Facility (kWh/year)
Tracked by Fiscal Year

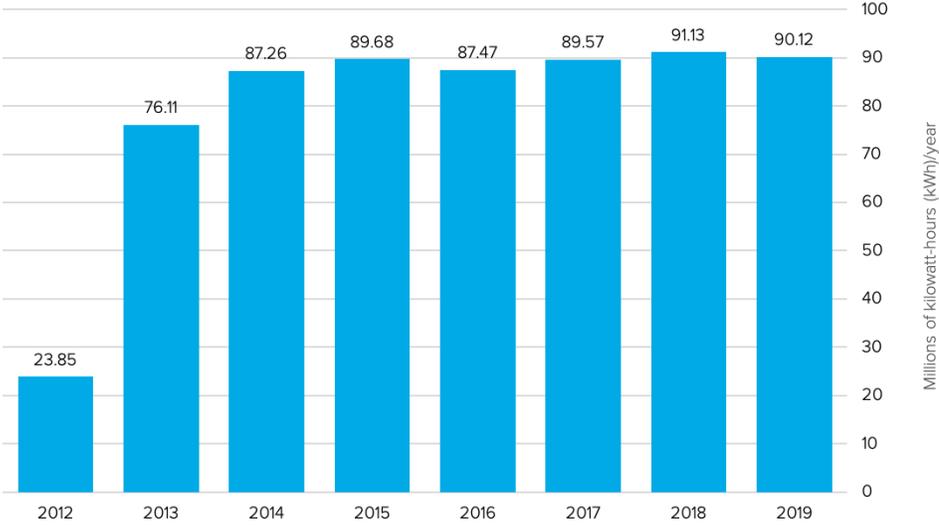


Figure 10: Electrical Consumption for Petascale

F&S employees work hand in hand with Facility Managers throughout campus to maintain and improve University-owned buildings. With the implementation of the Integrated and Value-

Centered Budget (IVCB) in FY20, colleges are now responsible for both space usage costs and building-level energy costs. This increases college-level incentives to improve energy efficiency in the buildings and spaces they occupy.

To achieve this objective, every occupant of a University-owned building needs to participate in the iCAP commitment and seek ways to reduce energy consumption. To support this, F&S is collaborating with Illinois Solar Decathlon (ISD) to create building-level energy and water report cards. This process pulls available data from the Energy Billing System and evaluates total energy reduction since FY08.

As a starting point, the ISD Concept Team has compiled building-level report cards for all facilities that won the Energy Conservation Incentive Program (ECIP).³⁹ The next steps include working with contacts from individual buildings to strategize energy efficiency solutions. F&S will connect with the Facility Manager, a building-level communications contact, and a related student organization to develop strategies for reducing the total energy consumption of individual buildings.

#2.3 [F&S] Use clean energy sources for 15% of total campus energy demand by FY30.

Clean energy sources for campus can include, but are not limited to: solar, wind, geothermal, biofuels, biomass, renewable natural gas, and nuclear. The University should continue to support and encourage the pursuance of grant and research opportunities in these emerging renewable energy markets as well as other clean energy technologies.

A key concept in the transition to clean energy is the difference between electricity and total energy. In FY19, electricity accounted for just 38% of our total campus energy consumption; the district heating and cooling systems, as well as certain buildings with direct natural gas connections, accounted for the other 62%. Because the most prevalent clean energy technologies in the news are electricity-generating wind and solar systems, many discussions about clean energy focus on clean power.

Since the first iCAP in 2010, we have made progress on incorporating clean energy for both power and thermal energy on campus, but we have maintained a primary focus on electrical power. Figure 11 outlines the clean energy used on campus in FY19.

Clean Energy Source	MWh in FY19
Wind Power Purchase Agreement	24,726
Solar Farm 1.0 Power Purchase Agreement	7,026
Business Instructional Facility rooftop solar	40

³⁹ <https://fs.illinois.edu/services/utilities-energy/energy-conservation/ecip>

Wassaja Residence Hall rooftop solar	41
Building Research Council ground-mount solar	21
Activities Recreation Center solar thermal heater	3
Energy Farm biomass heater	235
Total clean energy in FY19	39,092

Figure 11: Clean Energy Used on Campus in FY19

This 32,092 MWh of clean energy represents just 2.8% of the campus' total energy use in FY19. As a result of both planned and recently completed projects, we anticipate an additional 110,450 MWh/year by FY25. This additional energy would result in 12.2% of our total energy originating from clean sources (using our FY19 total energy use as a point of comparison). Ultimately, this objective seeks to increase that percentage to at least 15% by FY30. The clean energy could come from any qualifying source, including: an anaerobic digester, thermal storage, fuel cells, batteries, reuse of waste heat, and nuclear.

With more than 250 campus buildings using steam heat, we cannot focus our efforts exclusively on clean power; we must incorporate clean thermal energy as well. Past thermal energy efforts include consideration of a bio-gasification plant in Rantoul, tests for mixing coal at Abbott Power Plant with a percentage of biomass (i.e., organic matter such as agricultural crops used for energy production or wood chips), and designs for a biomass combined heat and power plant at the Vet Med facility.

Although those initiatives were ultimately cancelled, a 198 kW Heizomat biomass boiler was installed at the Energy Farm in June 2017 under iSEE leadership.⁴⁰ This project was made possible by generous support from the Illinois Clean Energy Community Foundation (ICECF) and the Student Sustainability Committee (SSC). Additional funding was provided by the University of Illinois Dudley Smith Initiative, the Carbon Credit Sales Fund, and the Revolving Loan Fund. It is a successful demonstration of using biomass (i.e., the Miscanthus grown for research at the Energy Farm) to heat a greenhouse, and the facility could be expanded to provide more clean energy.

The Activities and Recreation Center (ARC) features a solar thermal system, which reduces the need to use thermal energy from other sources. This system produces sufficient clean thermal energy to heat the three Olympic-sized swimming pools — and all domestic hot water used — in that facility. While the existing solar thermal array is small-scale, producing only 3 MWh/year of clean energy, this technology is highly viable in the central Midwest and should be considered for additional campus locations.

⁴⁰ <https://sustainability.illinois.edu/coming-soon-to-campus-energy-farm-biomass-boiler/>

In addition to those mentioned previously, there are several researchers on campus actively developing clean energy solutions. In collaboration with the Urbana-Champaign Sanitary District (UCSD), studies are underway for converting food scraps to energy using the UCSD anaerobic digester. Another program is fine-tuning the process of converting used plastic waste to diesel fuel. Energy storage research is also expanding now, including potential for using geothermal technology for storage. Additional examples of clean energy research and testing are described throughout the remainder of this chapter.

The objective's extended timeline will allow us sufficient time to identify clean energy sources and modify Abbott Power Plant operations accordingly.

#2.3.1 [F&S] Use at least 140,000 MWh/year of clean power (about 30% of annual power demand) by FY25.

As one component of Objective #2.3, campus will continue to transition to using clean energy sources for power. When calculating our total clean electricity use, we include only power that has associated Renewable Energy Certifications (RECs) in our possession. Thus, the changes in the regional electrical grid,⁴¹ sometimes referred to as “greening of the grid,” do not impact our reporting of clean power consumed. This is consistent with the requirements of the EPA’s Green Power Partnership reporting system and the Federal Trade Commission’s Green Guides.⁴²

Figure 12 illustrates the sources for all electricity used on campus in FY19. As shown, approximately 7.3% of our power was generated directly from clean energy sources. The total of 31,854 MWh/year of clean electricity was acquired from both on-campus solar energy (7,128 MWh) and off-campus wind energy (24,726 MWh). When the Solar Farm 2.0 project is complete, it is expected to increase campus-generated clean energy to more than 50,000 MWh/year, which will surpass 10% of our existing power demand. This is excellent progress!

⁴¹ Campus is in egrid subregion SRMW = SERC Midwest, see <https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid>

⁴² <https://www.ftc.gov/news-events/media-resources/truth-advertising/green-guides>

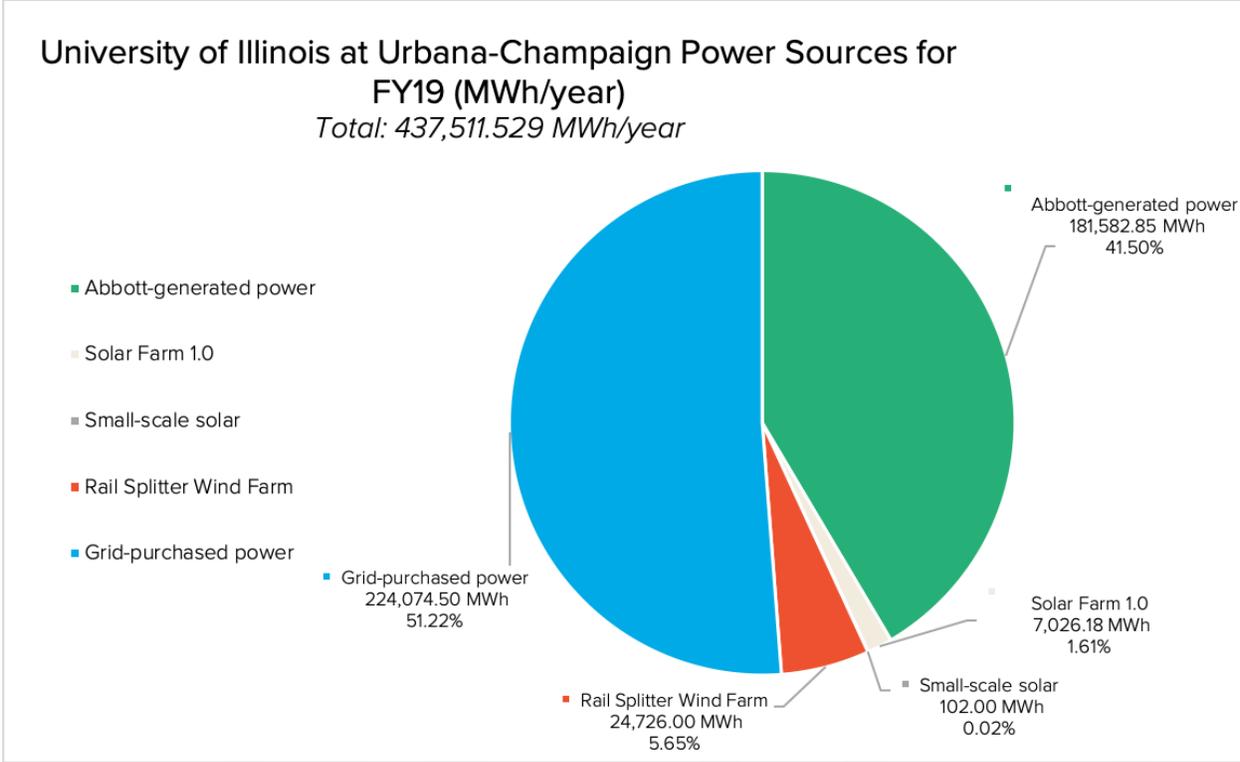


Figure 12: FY19 Campus Electricity Sources

To continue building on these successes, we have set a goal of using 140,000 MWh/year of electricity from clean power sources, approximately 30% of our annual power demand, by FY25. This will require purchasing clean energy from off campus, and we have been investigating options to do so. The Energy SWATeam submitted a recommendation in May 2018 to “Explore the option of a [power purchase agreement (PPA)] with a local solar developer.” We are hopeful that a large-scale power purchase agreement for 90,000 MWh/year of solar power will be a cost-effective method for achieving this objective.

#2.3.2 [F&S] Use at least 150,000 MMBTU/year of clean thermal energy by FY30.

As stated in the Introduction, the University of Illinois owns a best-in-class combined heat and power plant called Abbott Power Plant, a district steam heating system, a district chilled water cooling system with energy storage (the Campus Chilled Water System [CCWS]), and the campus electrical grid. This comprehensive network of energy processes (Figure 13) has served us well; in fact, many cities and campuses around the world are planning to implement district heating and cooling systems to increase energy efficiency.

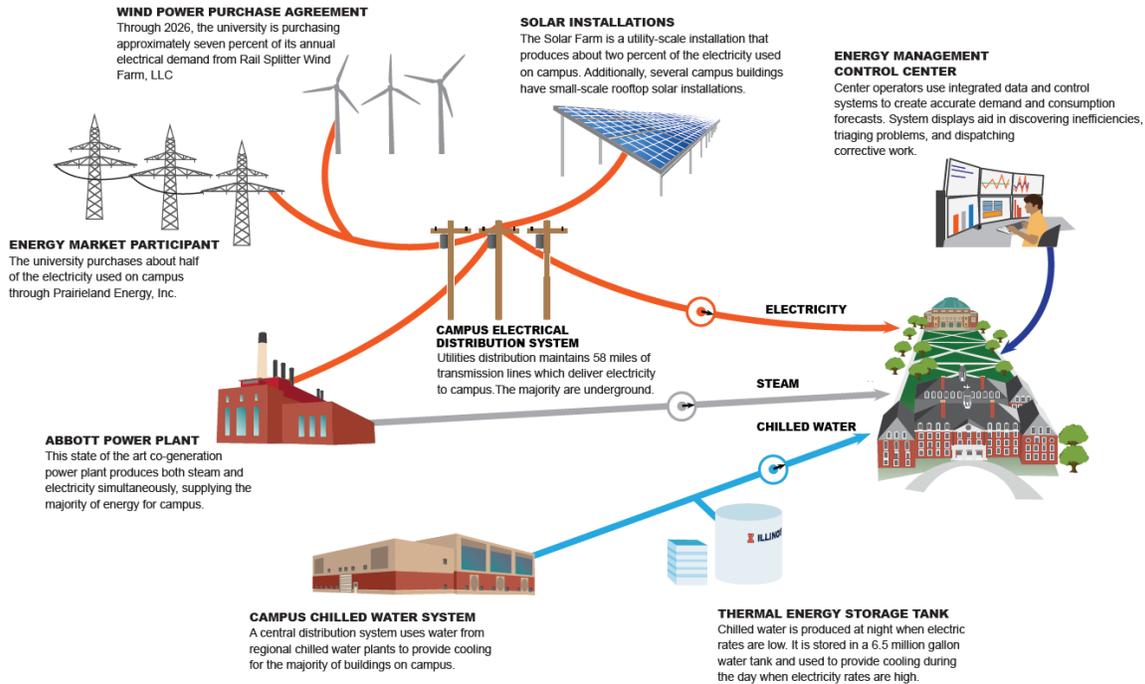


Figure 13: University of Illinois at Urbana-Champaign Energy Systems

As shown in Figure 14, Abbott generated 80% of the total campus energy consumption in FY19, including 41% of the electricity used on campus. Using the best available air pollution control technology, Abbott meets or exceeds all EPA emission standards. Electrostatic precipitators and a flue gas desulfurization unit (scrubber), supported by a Continuous Emission Monitoring System in the stack, remove 90% of air pollutants, providing significant environmental benefits. Efficient cogeneration coupled with emission reduction equipment have reduced carbon dioxide emissions by 101,000 tons per year,⁴³ compared to conventional electric generation and heat-only systems.

43 <https://fs.illinois.edu/services/utilities-energy/production/abbott-power-plant>

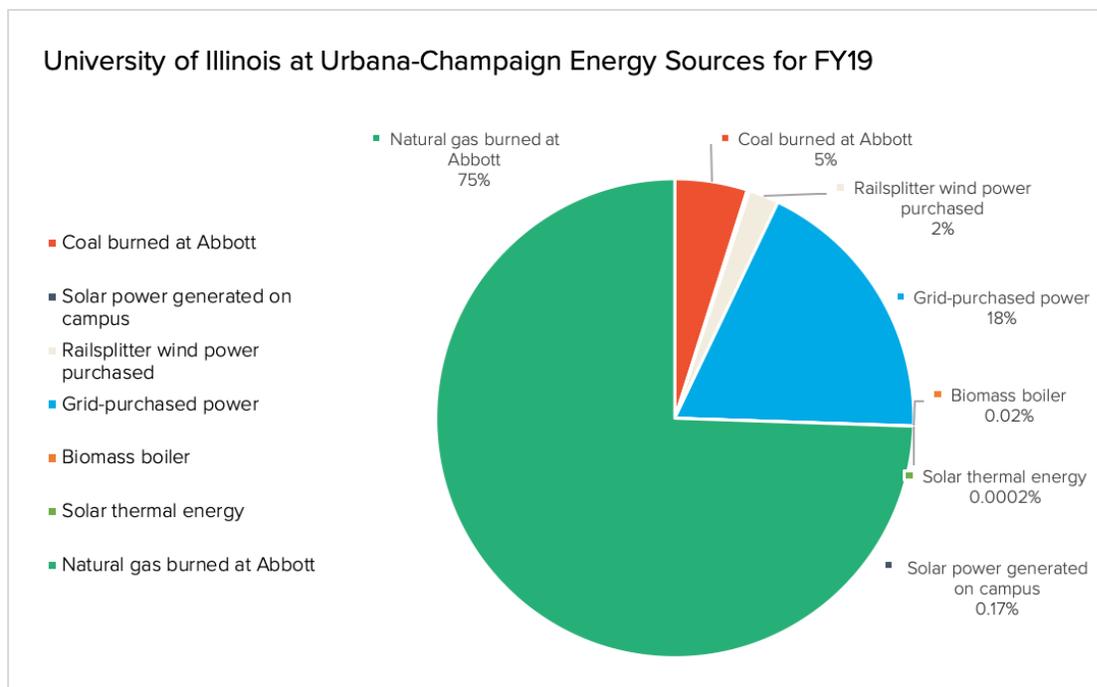


Figure 14: FY19 Campus Energy Sources

Currently, burning fossil fuels is the only available method for producing the steam needed to heat campus through the district heating system. In keeping with our carbon-neutrality goal, F&S has investigated several methods for reducing fossil fuel use at Abbott and subsequently reducing our total emissions. The 2010 iCAP included a plan to “evaluate the potential for: 1) eliminating summer coal use in the near term; 2) eliminating all coal use by 2017; and 3) alternative means of generating and distributing thermal energy (hot water distribution, regeneration, geothermal looping) in the long term.”⁴⁴ The resulting study, called the Utility Production and Distribution Master Plan,⁴⁵ was completed in 2015.

One major change since the FY08 baseline is our shift away from burning coal. The total energy generated as a result of burning coal at Abbott decreased by an impressive 89% from FY08 (1,792,464 MMBTU) to FY19 (203,954 MMBTU). The continued use of coal at Abbott helps meet the heating demand for campus during the coldest months of the year. Illinois is a national leader in the study of carbon capture and carbon storage technology, and F&S is collaborating with researchers at the Illinois Sustainable Technology Center (ISTC) to test carbon capture technology, using Abbott as a living lab.⁴⁶ ISTC is also using Abbott flue gas in studies related to algal biomass and biofuels.

Other options that can be explored for reducing emissions at Abbott include the potential to use geothermal or solar thermal to preheat water before it goes to the existing coal or natural gas

⁴⁴ https://icap.sustainability.illinois.edu/files/project/36/iCAP_FINAL.pdf

⁴⁵ <https://www.uocpres.uillinois.edu/resources/uiucplan>

⁴⁶ https://www.istc.illinois.edu/research/energy/carbon_capture

boilers. F&S collaborated with Illinois Business Consulting (IBC) to investigate the potential for mixing in woody biomass with the coal, but it was determined infeasible.⁴⁷

Another potential clean energy solution that can be implemented at Abbott or elsewhere on campus is Advanced Small Modular Reactors. Faculty from the department of Nuclear, Plasma and Radiological Engineering (NPRE) believe the installation of a micro-reactor to produce steam at Abbott is an emissions-free alternative to fossil fuels. The high energy demand of the University offers opportunities for interdisciplinary research to address our challenges to reduce our campus energy consumption, especially pertaining to steam production. The role of nuclear power in our greater energy system is still uncertain. Illinois faculty are researching and collaborating with key stakeholders to address potential barriers and strategies to overcome uncertainties. As we work to expand renewable resources and ultimately achieve carbon neutrality, the feasibility of nuclear reactor technology will continue to be studied.

We are also implementing alternative heating and cooling solutions in individual buildings, such as chilled-beams, heat-recovery chillers, energy recovery wheels, and geothermal. The chilled-beam heating and cooling system is incredibly energy-efficient in the Electrical and Computer Engineering Building, and research innovation projects for geothermal energy systems at the Energy Farm, Campus Instructional Facility, and the Ven Te Chow Hydrosystems Laboratory are currently in progress.

In addition to the chilled water thermal energy storage tank described earlier, researchers are investigating the use of geothermal energy storage systems and advanced battery technology.

#2.3.3 [F&S] Support the transition to electric heating by converting 25 campus buildings to hot-water, low-temp heating systems between FY20 and FY24.

As clean energy technologies expand and become more viable, we must proactively equip campus buildings to accommodate them. One way to do this is by converting older buildings from steam heating to hot-water, low-temperature heating systems.

Since 2010, all new campus buildings have been designed and constructed for hot-water heating systems, which require lower temperatures than steam. Similarly, as existing buildings have undergone refurbishment, steam heating systems have been replaced with hot-water systems. Hot-water systems not only require lower cost to maintain, but are also easier to control, resulting in increased comfort for building occupants. Moving forward, we will continue to require the use of hot-water heating systems for all new construction; additionally, campus should proactively work to replace steam heating systems in existing buildings, with 25 buildings successfully transitioned between FY20 and FY24. This long-term plan to shift from devices that heat directly with steam to systems that use low-temperature hot water is necessary for campus to better utilize clean energy in significantly larger quantities.

Over 170 campus buildings utilize steam for heating purposes. While objective #2.3.3 specifically concerns the timeframe from FY20 to FY24, it is recommended that all of these

⁴⁷ <https://icap.sustainability.illinois.edu/project/biomass-co-firing-pilot-abbott-power-plant>

buildings be converted from steam to hot-water systems by FY45. Other key initiatives include converting inefficient HVAC systems to types that are compliant with current energy codes and updating the controls to reflect modern technology. These HVAC and control upgrades should be implemented in tandem with conversion to hot-water systems wherever possible, as that will amplify efficiency and result in a better return on those investments. Together, these conversions can help campus buildings move toward 100% hot-water heat, position us to utilize all potential clean energy technologies currently in existence, and contribute significantly to the University's goal of carbon neutrality by FY50.

Conclusion

Due to sheer volume and versatility, energy-based emissions occupy a major portion of our efforts toward carbon neutrality at the University of Illinois at Urbana-Champaign. In fact, the process of energy generation and distribution is the leading contributor of campus GHG emissions.⁴⁸ Therefore, curtailing our energy consumption is essential to achieving carbon neutrality by FY50.

With 650⁴⁹ university-owned buildings, improving energy efficiency requires a cooperative effort. Beyond the ongoing centralized energy efficiency work at F&S, we need to facilitate a culture of sustainability consciousness throughout the campus with particular regard to departmental units and Facility Coordinators. While encouraging individual energy users to make consistent lifestyle changes is certainly valuable, interacting directly with parties responsible for building-level energy management and further financial investment will significantly elevate our impact.

In the coming years, we intend to leverage a combination of strategic conservation measures, innovative investments in renewable energy, and thorough campus outreach efforts to reduce our carbon footprint as it pertains to energy use. With a concerted, "all-hands-on-deck" effort, we can make significant progress in this area.

⁴⁸ <https://icap.sustainability.illinois.edu/themes/energy>

⁴⁹ <https://fs.illinois.edu/docs/default-source/fir/uiuc-infrastructurefastfacts.pdf>

Chapter 3: Transportation

Introduction

From overseas academic conferences to the daily office commute, members of the Illinois community are always on the move. But constant travel has its consequences. In FY19, approximately 13% of campus greenhouse gas (GHG) emissions were traced to the following three categories of transportation: campus vehicle usage, commuting, and air travel.

The first category, campus vehicle usage, refers to our University-owned fleet. Fleet vehicles are used by Illinois personnel for purposes including police transportation, research, maintenance, construction, waste management, and short- and long-term rentals. The Urbana-Champaign campus owns more than 1,200 vehicles, of which approximately 500 belong to the Facilities & Services (F&S) fleet.

We are dedicated to ensuring that our campus fleet runs as sustainably as possible. In September 2015, F&S received Tier 2 Sustainable Fleet Accreditation from the National Association of Fleet Administrators (NAFA). Illinois is the first Big Ten university — and the first university in the state — to receive this accreditation, which comes as a result of decreased fuel usage, idling time, and GHG emissions.⁵⁰ Illinois has made significant strides toward mitigating fleet-related GHG emissions since 2015; as of FY19, campus fleet emissions decreased by approximately 25% from the FY08 baseline of 5,688 MTCO_{2e} as a result of reduced idling time, reduced trip frequency, and increased miles per gallon (mpg) per vehicle.^{51,52} As outlined in objective #3.1, we will further increase the sustainability of University-owned and -operated vehicles moving forward.

The second category of transportation GHG emissions is commuting. As opposed to our University-owned fleet, over which we have a great degree of control, carbon neutrality regarding our student, faculty, and staff commuters requires behavioral change at the individual level, where factors like ease of travel, convenience, housing options, family considerations, and even personal preference engender significant environmental repercussions.

Statistics support the impact of individual behavior change: FY19 metrics reveal that 60% of campus employees commute in single-occupancy vehicles (SOV): personal vehicles operated by a single driver with no passengers.⁵³ Similarly, 1,834 Student Permits and 328 Student Shuttle Permits (used for lots E-14 and B-22) were distributed in FY19, indicating widespread use of personal vehicles by our student population.

⁵⁰ <https://www.fs.illinois.edu/services/transportation-automotive>

⁵¹ <https://icap.sustainability.illinois.edu/metric/42-percent-reduction-emissions-ui-fleet>

⁵² <https://icap.sustainability.illinois.edu/metric/actual-fleet-emissions-fiscal-year>

⁵³ <https://icap.sustainability.illinois.edu/metric/44-percent-staff-driving-alone>

The Transportation SWATeam continues to work on implementing shared driving programs for employee commuting. This work will continue in the next five years and beyond to reduce the amount of vehicles on campus. By encouraging active and alternative transportation solutions, we can *generate positive environmental, social, and health improvements for our Illinois community*.

Notable achievements in sustainable transportation from 2015 to 2019 include:

- In October 2019, the University of Illinois at Urbana-Champaign was promoted from Bronze to Silver designation as a Bicycle Friendly University (BFU) by the League of American Bicyclists. Contributing factors include: the 2014 Campus Bicycle Plan; bike path, lane, and route improvements; bike rack parking expansion (campus now maintains more than 11,600 bike parking spaces); the [Bike at Illinois](#)⁵⁴ website launch; and the presence of 500 VeoRide bikes for sharing on campus since 2018. Illinois also uses Zipcar as a means for ride-sharing on campus.^{55,56}
- UI Ride, a shuttle service between the University of Illinois at Urbana-Champaign and the University of Illinois at Chicago, was unveiled in Fall 2019. The shuttle's three daily trips allow employees to commute between campuses and opt out of flights or SOV usage. Passengers can reserve trips online or through a smartphone app.^{57,58} Looking ahead, we expect that UI Ride will become more recognized as a viable option for University personnel, and individuals will take advantage of this convenient and timely service.
- In FY19, the University was able to staff the full-time equivalent (FTE) of three employees for sustainable transportation efforts, surpassing the target goal of two FTE employees (Figure 15). These positions include: Transportation Demand Management Coordinator at F&S; Sustainable Transportation Assistant at F&S; and Campus Bike Center Manager at Campus Recreation.⁵⁹

54 <https://bike.illinois.edu/>

55 https://webtest2.fs.illinois.edu/docs/default-source/news-docs/newsrelease_bicyclefriendly_silver_10172019.pdf

56 <https://www.fs.illinois.edu/resources/announcements/2019/10/17/university-of-illinois-promoted-to-a-silver-bicycle-friendly-university-by-the-league-of-american-bicyclists>

57 <https://www.uillinois.edu/uiride>

58 <https://apps.apple.com/us/app/ui-ride/id1479096812?ls=1>

59 <https://icap.sustainability.illinois.edu/project/appropriately-staff-sustainable-transportation-efforts>

Full-Time Employees for Sustainable Transportation Tracked by Fiscal Year

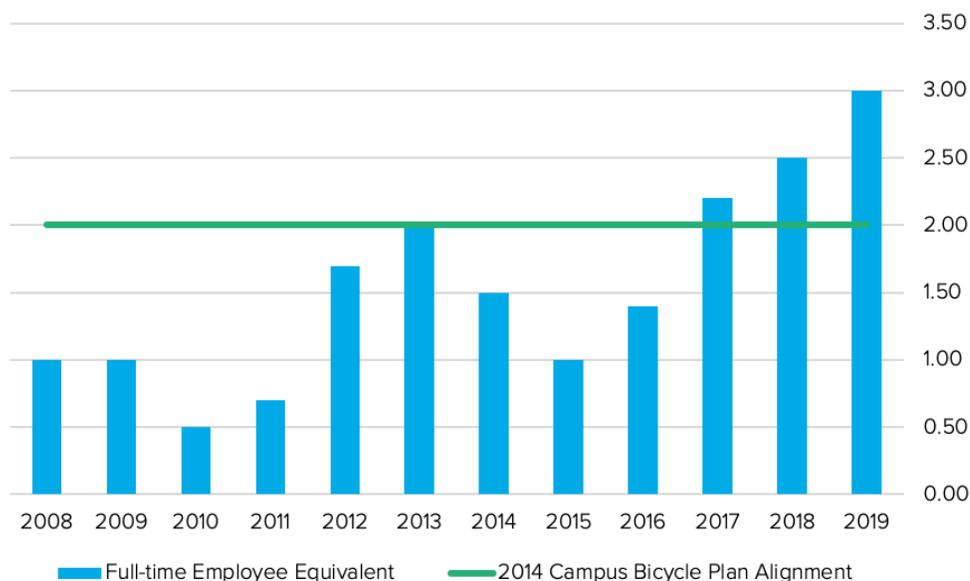


Figure 15: Full-Time Employees for Sustainable Transportation

As has historically been the case, the third category of transportation emissions, air travel, remains an outstanding challenge for the University. While there are many reasons for air travel by campus and community members, one key factor is the transformative research conducted by University personnel that requires frequent international and intercontinental collaboration.⁶⁰ As of July 2019, air travel emissions equaling 31,684.97 MTCO₂e comprised more than half of campus' Scope 3 emissions and 7.3% of its gross emissions.⁶¹ From FY14 to FY18, we reduced our total air travel emissions by 25%; while we are proud of this significant decrease, complete mitigation is unreasonable due to the centrality of certain air travel to the campus mission.

The University continues to explore viable alternatives to air travel. These include advanced teleconferencing technology and increased opportunities to telecommute or travel by train. Additionally, iSEE's online interactive [Guide to Purchasing Carbon Offsets](#)⁶² was established in Fall 2019 to educate users and encourage purchasing individual carbon offsets to combat unavoidable travel-related emissions. The sections below also include a discussion of carbon offset possibilities in the Champaign-Urbana community.

⁶⁰ The 2010 iCAP recommended a 30% decrease in overall transportation emissions from FY08-FY14. However, emissions increased by 30% over this time period. The rise was attributed solely to air travel: emissions in this category increased by 52% from FY08-FY14, and implementation of a sophisticated tracking system likely revealed more accurate—and thus greater—metrics than did previous assessments.

⁶¹ <http://reporting.secdnature.org/ape/ape-public/888>

⁶² <https://sustainability.illinois.edu/campus-sustainability/positive-steps-to-offsetting-your-carbon-footprint/>

With the following objectives, we strive to inform our campus and community about best practices for sustainable commuting, and equip them with the necessary infrastructure to make those lifestyle choices safe and enjoyable.

Transportation Objectives

The following Transportation objectives were developed by the SWATeams, iCAP Working Group, campus community, and Sustainability Council to guide the University's actions toward achieving carbon neutrality for transportation.

- 3.1 Fleet Replacement Plans**
- 3.2 Increase Pavement Condition Index**
- 3.3 Electric Vehicle Task Force**
- 3.4 Reduce Driving on Campus**
 - 3.4.1 Car Free Commuter Program**
 - 3.4.2 Implement Campus Bike Plan**
 - 3.4.3 Telecommuting Policies**
- 3.5 Offset Air Travel Emissions**

#3.1 [Fleet Managers] Improve University-owned vehicle fuel efficiency through the establishment of written replacement plans for at least 80% of campus fleets by FY24.

In recent years, the U of I has made great strides in improving the sustainability of our campus-owned fleet. Facilities & Services (F&S) previously implemented a sustainable fleet plan⁶³ and achieved green certification with the National Association of Fleet Administrators (NAFA); moving forward, we plan to not only continually pursue the most effective certification programs, but also to expand efforts to “green” campus fleets beyond F&S.

Establish written replacement plans

While the responsibility to implement this objective rests with all fleet managers across campus, the majority of campus units do not possess a comprehensive strategy for fleet optimization. Development of such plans would effectively provide the structure for a campuswide approach to sustainable vehicle management.

One of the best ways to improve fleet efficiency is implementing vehicle upgrades: transitioning from older to newer models that are better optimized for fuel consumption. However, even after upgrading to fuel-efficient or electric vehicles (EV), fleets containing more machines than necessary can still actively burn excess energy, fuel, and funding. That said, a strategy called “right-sizing” incorporates an inventory check to determine the extent to which University vehicles are being used 1) to complete necessary tasks 2) by designated personnel 3) in a fuel- and cost-efficient manner. Once the inventory is completed, changes can be implemented so that each fleet is optimized to match individual departmental needs.

⁶³ <https://icap.sustainability.illinois.edu/project/fs-sustainable-fleet-plan>

Idling engine restrictions

In addition to upgrading and resizing, campus fleets should adopt and enforce restrictions on engine idling by FY24. Idling occurs when a vehicle's engine is running (and therefore expelling emissions) despite not being in motion, thus unnecessarily contributing to our total GHG emissions.

Sustainable fuels

In the past, F&S has explored options for acquiring service vehicles that use alternative fuel sources. These include two E-ride electric service vehicles, eight zero-emission Global Electric Motorcars (GEM) purchased in 2004, and eight gas-powered low-speed vehicles (LSV) from four different manufacturers. LSVs, which do not typically exceed 3,000 pounds, are uniquely governed to 25 mph. None of these vehicles are currently in service at the University due to a combination of reliability concerns, insufficient part supply, vendor availability, and personnel fluctuation. As the alternative fuel industry continues to progress, however, new technologies may emerge and existing technologies may become more viable for campus use.

A current example of an alternative fuel technology that has previously been integrated with the F&S fleet is a product of the Illini Biodiesel Initiative. Using a new facility at the Integrated Bioprocessing Research Laboratory (IBRL), this student-led program converts used vegetable oil from dining halls into 100% biodiesel. Students are working to certify the resulting biodiesel so it can be mixed with the 5% biodiesel mixture that F&S purchases for the fleet; when ready, this product can be implemented to increase the fleet's sustainability.

Looking ahead, a promising future technology for the campus is an anaerobic digester planned to accompany the construction of a new Dairy Facility. The proposed digester would use organic waste to produce biofertilizer and biogas, which could be upgraded to renewable natural gas (RNG) and further processed into renewable compressed natural gas (CNG). The renewable CNG could then be used as fuel for the campus fleet. Another potential source of renewable CNG is a collaboration with the Urbana-Champaign Sanitary District (UCSD), which has an operational anaerobic digester already in use. UCSD has investigated the possibility of biogas upgradation, and the University could contribute toward the Upgradation Unit and pipeline injection and install a CNG conversion station on campus for the University fleet.

#3.2 [F&S] Increase the Pavement Condition Index (PCI) for University-owned roads so the average PCI score is at least 65 by FY25 and at least 70 by FY30.

As with the University-owned fleet regulations described in #3.1, we want to implement the best possible practices for all transportation assets falling under campus jurisdiction. Therefore, our second objective addresses the extensive system of University-owned streets.⁶⁴ Where sustainability is concerned, optimizing road surfaces should be taken just as seriously as optimizing the vehicles that drive on them.

The key metric for this objective is Pavement Condition Index (PCI), "a numerical rating resulting from a pavement condition survey that represents the severity of surface distresses."⁶⁵ Essentially, this metric provides a standardized process to quantify road quality. For example:

⁶⁴ <https://fs.illinois.edu/docs/default-source/Resources/campus-street-ownership.pdf?sfvrsn=0>

⁶⁵ https://www.fhwa.dot.gov/pavement/management/gm/data_qm_guide.pdf

Are there numerous potholes, cracks, or bumps? Do vehicles slip easily? As defined by ASTM International, PCI ratings occupy a scale of 0-100, with 0-10 resulting in a “Failed” status and 85-100 meriting a “Good” pavement condition. As of evaluations completed in 2016, the network of roads owned by campus and maintained by Facilities & Services (F&S) had a PCI of 64; however, this figure has changed in the last several years as some roadway projects were completed while other roads experienced deterioration. With regular analyses planned every three to five years, we aim to increase our PCI rating in the coming years.

Sustainable pavement materials

Sustainability and pavement condition go hand-in-hand; a suggested strategy for improving both aspects of our University-owned road system is increasing the use of sustainable pavements. Implementing materials such as permeable pavements and biobinders will not only benefit the roads themselves but will also improve our flood and rainwater management infrastructure.

On a campus where more than 50% of the surface area is occupied by buildings or paved in roadways, walking paths, and parking lots, efficient rainwater management poses a problem. While traditional pavement necessitates extensive gutter and drainage systems to manage water, permeable pavements (e.g., porous asphalt, which was used to pave parking lots C-8/C-9 in FY12⁶⁶) allow a portion of rainwater to flow through the pavement and into a permeable gravel layer below, essentially facilitating built-in water quality treatment and flood control. This process also keeps the pavement itself well-drained and in good condition, subsequently resulting in a higher PCI rating. Although installing permeable pavement can be costly, the reduced need for expensive stormwater infrastructure (i.e. curbs, gutters, storm drains, etc.) roughly equates the long-term expenses to those of traditional pavement.

Biobinders are a second option for increasing the sustainability of our University-owned roads. In terms of concrete pavement composition, asphalt and cement are considered “binders,” or the agents that bind rocks, gravel, and sand together to form the surfaces used on roads. While useful as bonding agents, asphalt and cement are two of the many synthetic materials derived from petroleum (which is itself derived from fossil fuels). As evidenced by the name, biobinders and bio-asphalt varieties are instead created from biomass materials. For example, research conducted through the Illinois Sustainable Technology Center (ISTC)⁶⁷ explored potential for biobinders or bio-oil made from the pyrolysis of solid feedstock such as Miscanthus (an energy grass) or hydrothermal liquefaction (HTL) of manure, food waste, algae, and other organic waste.

Moving forward, we will investigate opportunities to integrate additional sustainable materials such as fly ash and recycled glass into the composition of our campus pavements.

⁶⁶ <https://icap.sustainability.illinois.edu/project/porous-asphalt-parking-lot-c-8-c-9>

⁶⁷ https://www.istc.illinois.edu/research/waste_utilization/bio-oils_bioulubricants/biobinders/

#3.3 [Parking] Establish an Electric Vehicle Task Force to identify key goals for supporting the use of electric vehicles on and off campus by FY22.

Objectives #3.1 and #3.2 focus on vehicles and roadways within the University's jurisdiction. However, many of our transportation objectives rely on individual decision-making as well as policy; we therefore strive to make campus conducive to environmentally conscious lifestyle choices. One avenue for individual action concerns Electric Vehicle (EV) usage.

In 2018, Provost Cangelaris formed an EV Charging Task Force "to make recommendations on what steps should be taken by the University, both now and in the future, to make EV charging available to commuters."

In this region of the electric grid, an EV typically emits [less GHG than a conventional gas-fueled vehicle of similar size](#).⁶⁸ The Parking Department supports sustainability through implementation of public-use EV charging spaces, with 13 Level 1 charging spaces currently on campus at five locations, and six Level 2 plug-ins at three on-campus locations.

Other charging stations have been added by individual departments outside of the Parking Department's efforts. These include Research Park, the Illini Union, iSEE, and F&S. To develop a holistic strategy for EV charging infrastructure and to identify key goals for supporting the use of EVs both on and off campus, the Parking Department should form a new EV Task Force. This task force will include consideration of how to encourage a transition to EVs for students, faculty, staff, and the community at large.

#3.4 [F&S] Reduce driving on campus and report the percentage of staff trips made using single-occupancy vehicles from 60% to 50% by FY25 and 45% by FY30.

⁶⁸ https://afdc.energy.gov/vehicles/electric_emissions.html

Percent Staff Driving Alone Tracked by Fiscal Year

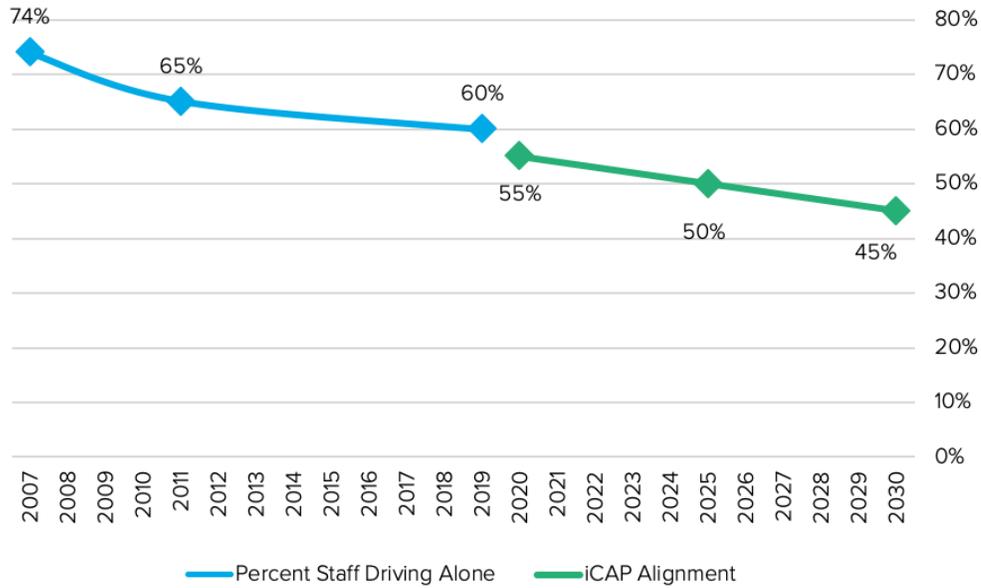


Figure 16: Percent of Staff Trips Made Using SOVs

Reducing automobile traffic in the University District is a long-term endeavor for this campus as well as our community transportation partners. Efforts in this direction are greatly influenced by the initial work enacted through the Campus Area Transportation Study (CATS) technical and policy advisory committees' cohesive planning.

The core campus area has experienced a reduction in vehicle traffic since the turn of the century; however, there remains a long road ahead. While only 10% of the student population drives alone, this tends not to be the case for faculty and staff, many of whom commute to campus in single-occupancy vehicles.

Outside of the emissions generated from driving to work, high single-occupancy vehicle (SOV) usage on campus has many negative environmental repercussions. For example: while many campus commuters possess a designated parking space, some do not; for these individuals, finding an available space on campus can pose problems. "Parking hunting," or the act of driving for excessive periods of time in search of a parking space, uses a significant amount of gas and generates increased emissions. To remedy this issue, a smartphone application could assist in locating available parking spots. The app would likely work in tandem with the parking pay application, and it could reduce total time spent parking hunting. To obtain more information about parking availability, iSEE funded the Campus as a Living Laboratory (CALL) project, "City Traffic as a Reservoir System."

This objective, which aims to decrease negative fallout from driving both to and around campus, is directly related to choices made by individuals. In the last five years, we have decreased the

percentage of staff driving alone from 65% to 60% (Figure 16); we are proud of this achievement and commend our campus and community members for their environmentally conscious choices.

While our key performance indicator reflects the percentage of staff who regularly travel in SOVs, this objective is truly centered on behavioral choices and sustainability consciousness. Though the nature of this objective is to produce quantifiable results by reducing the percentage of SOV usage, we acknowledge that the factors influencing personal vehicle choice are complex and widely varied among individuals (e.g., cost-effectiveness drives many students to live off-campus and commute to class or work). Moving forward, we will continue to strengthen our progress toward lowering SOV usage by fostering circumstances enabling individuals to get where they need to be in a sustainable fashion. We will support the transportation strategies outlined in the 2017 Campus Master Plan such as closing streets to cars and implementing a shuttle system along Matthews Avenue. Through our continued commitment to an emphasis on walking, bicycling, and transit, we expect that more students, faculty, and staff will shift to sustainable, healthy, and active travel modes.

To keep our metrics updated and our progress on track as we strive for a 45% SOV use rate by FY30, iSEE will disseminate a travel survey every three years.

#3.4.1 [Parking] Develop a Commuter Program (Bus, Bike, and Hike) for faculty and staff. Register 100 people by FY24 and 500 people by FY30.

This objective offers a convenient Commuter Program to incentivize faculty and staff to leave their personal vehicles off campus. Incentives through this program would only be offered to employees who relinquish their annual campus parking permits; as such, all participants will be required to obtain verification through the Parking Department.

Currently, six of the 14 Big Ten schools implement some version of a commuter program for employees and/or students. As inspired by the efforts of other institutions, potential incentives to be implemented on the Urbana-Champaign campus might include:

- Limited availability of daily parking passes for occasional needs;
- Access to an emergency ride home program;
- Direct support for active travel choices made by University employees;
- Discounted charging for electric vehicles (EV);
- Discounted bike-sharing opportunities;
- Discounted access to UI Ride;
- Discounted or credited medical insurance;
- Access to campus showers;
- Free ZipCar memberships, including a yearly stipend of driving credits;
- Opportunities for eco-conscious travelers to win a gift card or other monetary incentive; and/or
- Opportunities to receive tax credits.

As previously mentioned, our Commuter Program will encourage employees to forgo parking permits in favor of “Bus, Bike, and Hike” active modes of transportation. The program will also connect employees with convenient solutions such as telecommuting programs and carpool programs. Campus as a Living Lab seed-funding provided financial support to pursue a survey on driving and carpooling potential. This work will continue in the coming years to ultimately encourage less driving and vehicles on campus.

“Bus”

As we continue encouraging community members to take advantage of public transportation and the need for mass transit grows, we remain committed to maintaining our strong relationship with the Champaign-Urbana Mass Transit District (MTD). MTD is an excellent example of a sustainable operation, and it is certified by the Illinois Green Business Association (which was started by Illinois students). It is also [ISO 14001 certified](#)⁶⁹ since 2013, and has converted 85% of its fleet to hybrid electric buses. Most recently, MTD began using [hydrogen-fuel-cell buses](#).⁷⁰

As part of our campaign to increase awareness of the opportunities provided by MTD in the Urbana-Champaign community, F&S will offer at least two [“It’s Your MTD, Too”](#)⁷¹ workshops annually. These workshops are a collaboration between F&S and MTD to encourage faculty, staff, and students to use the various services MTD provides.

“Bike”

Bicycling is the most sustainable form of personal transportation, allowing individuals to travel long distances per unit of energy; in this case, the calorie. Several groups have worked together for many years to improve the friendliness of our bicycle infrastructure throughout the county, our local communities, and on campus. In addition to the implementation of the Campus Bicycle Master Plan, we will support and enhance the Bike at Illinois⁷² initiative to spread awareness of bicyclist programming and rules of the road.

“Hike”

Active transportation, such as biking and walking, is not only good for the environment, but beneficial to individuals’ mental and physical health. We will encourage awareness of the myriad benefits that walking (to work, class, or a lunchtime or meeting destination) has to offer through a training that focuses on “the wellness of walking.”

Additionally, we want to make the experience of walking on campus as pleasant and enjoyable as possible by using strategic landscape architecture to create visually beautiful walking paths.

69 <https://www.masstransitmag.com/home/press-release/11175531/champaignurbana-mass-transit-district-il-mtd-environmental-program-certified>

70 <https://www.greencarcongress.com/2020/02/20200226-mtd.html>

71 <https://icap.sustainability.illinois.edu/project/its-your-mtd-too>

72 <https://bike.illinois.edu/>

#3.4.2 [F&S] Continue to implement the 2014 Campus Bike Plan.

The 2014 Campus Bicycle Master Plan (henceforth, Bike Plan) focuses primarily on infrastructural improvements to the University's network of bikeways, in order to:

1. Increase safety for all users;
2. Encourage a sustainable mode of transportation;
3. Improve the bicycling experience for all campus cyclists;
4. Identify funding needs and secure funding for bicycle infrastructure and programming improvements; and
5. Improve the University's standing as a national leader in bicycling.

This objective is intended to continually support and implement the 2014 Campus Bicycle Plan to achieve the goals listed above. The Bike Plan lists several high-, medium-, and low-priority bikeway improvement projects as well as safety information and educational opportunities. In addition to providing campus bicyclists and pedestrians with safety information and relevant rules of the road, we want to take further steps (e.g., improving traffic calming measures in heavily-trafficked streets and intersections) to ensure that the campus itself is safe and conducive to bicycle travel.

Bicycle Friendly University (BFU)

As stated in the introduction, Illinois was promoted to Silver BFU status by the League of American Bicyclists (LAB) in October 2019 because of great progress in bicycle engineering, education, enforcement, evaluation, and encouragement. Moving forward, we intend to maintain the qualities that have earned us this designation, and continue building upon and improving the bicycle friendliness of our campus. To further elevate our BFU status, the LAB recommends implementing a national bicycle registration program to increase the number of bicycles registered on campus. Our current goal is to achieve Gold BFU status by FY27.

Long-term bike storage

As part of our efforts to encourage bicycling on campus, we want to ease the logistical difficulties that many individuals — particularly students — face with the task of keeping a bike at school. This is especially true of students in apartments with limited storage space. We plan to implement long-term bicycle storage (i.e., a garage-like space capable of storing 1,000 or more bicycles) on campus by FY24.

Bike sharing and maintenance

More departmental bikes (e.g., those owned by iSEE, F&S, the Sustainability Living Learning Community [SLLC]) will be offered. To ensure that campus-owned bikes are well taken care of, personnel with access to departmental bicycles will be encouraged to participate in bicycle maintenance courses. Likewise, students will continue to have access to short-term bike rentals

(e.g., through the VeoRide bike sharing company). Long-term bike rentals will be made available as well.⁷³

#3.4.3 [F&S w/IHR] Establish telecommuting policies for the campus by FY24.

The shelter-in-place guidelines imposed as a result of COVID-19 established telecommuting as not only plausible, but also highly manageable for campus units. Moving forward, we hope to investigate and develop telecommuting options to promote the environmental benefits that this work model entails.

First, we will discuss potential strategies for employees for whom telecommuting is a viable scenario. Regarding the remaining employees, we will consider allotting a designated number of days per year to optional telecommuting; currently, certain organizations in India are considering similar protocols, with 15 days as a suggested starting point. Incentivized solutions (e.g., an encouraged one-day-per-week telecommuting policy) will also be explored.

On May 6, 2020, Chancellor Jones distributed an email message including the following statement: “The timing and the working arrangements of individual employees will not be the same for everyone. This allows our colleges and departments the necessary flexibility to implement their specific plans within parameters outlined by public health officials.” Similarly, we hope to establish guidelines to standardize remote work practices for all employees, while allowing for flexibility regarding the specific exercise of these options.

While work-from-home precautions taken in light of COVID-19 were implemented out of necessity, it is our hope that these practices can continue into the future out of environmental stewardship.

#3.5 [iSEE] Reduce net air travel emissions from FY14 baseline: 50% by FY24; 100% by FY30.

Air travel is the University’s largest source of transportation-based emissions. As of FY18, however, we were able to decrease our air travel emissions by 25% from the updated FY14 baseline. As we continue to augment existing efforts with innovative solutions, we can confidently push further to double our existing reduction by FY24. Added mitigation through future carbon offsetting programs makes the target of net-zero air travel emissions by FY30 feasible as well.

Business Travel Survey

The most direct step toward reducing air travel emissions for the campus community is reducing the frequency of air travel itself. To move forward with confidence, we must begin with a thorough knowledge of where we currently stand: from FY21 to FY24, we will conduct an annual business travel survey to obtain this foundational information. By surveying campus personnel regarding the reason, regularity, and urgency with which they travel by plane on University

⁷³ <https://www.neutralcycle.com/rental>

business, we can identify opportunities for alternative methods of transportation such as the UI Ride program and teleconferencing.

A preliminary step for implementing this strategy is to conduct a survey of UI Ride passengers. Survey questions will ask riders where they are coming from, where they are going, whether their travel is related to research, teaching, or administration, and how else (or if) they would have made that particular trip if not with UI Ride. A random sample of riders will receive a card with a QR code for the survey, and responses will be recorded electronically.

Campus teleconferencing audit

While we are committed to curbing University-related air travel, the need for partnerships with other institutions around the world remains strong. Recent advancements in teleconferencing technology present an accessible user-friendly compromise that balances the need for collaboration with the responsibility to remain carbon-neutral.

The need for remote communication options became particularly pressing in Spring 2020 as concerns related to COVID-19 reprioritized the virtual workspace from aspiration to necessity. Adapting to these changing circumstances within a compressed time frame brought our need for robust telecommunication infrastructure into sharp relief; however, it also proved our capability for adopting these technologies and integrating them into our daily lives. With a comprehensive strategy, our approach to telecommunication can, and will, become more seamless and sophisticated.

The first step of this comprehensive strategy involves completing an inventory of on-campus teleconferencing facilities and their accessibility by the end of FY21. SWATeam members will develop a standardized form for distribution to departments and other on-campus units. The form will record availability of teleconferencing facilities within campus buildings; specifically, rooms with high-quality teleconferencing capabilities and/or the ability to host group meetings remotely. Each department will be expected to complete this survey in the most comprehensive fashion possible.

In addition to on-campus facilities, we hope to continue enabling University students, faculty, and staff to conduct teleconferences and remote work from their individual homes. Telework from personal devices was crucial to maintaining campus operations throughout the COVID-19 shelter-in-place mandate, and we commit to supporting these opportunities in the future. Ultimately, our goal is to take stock of current teleconferencing capabilities, and assess the need to invest in a higher quality or quantity as we move toward air travel alternatives.

In keeping with the University's history of innovation and advancement, we will adopt up-and-coming technologies, and use them to our, and the environment's, advantage.

Carbon offsets program

When air travel on University business is unavoidable, purchasing carbon offsets is an option to counteract the flight's emissions. As mentioned in the introduction, the iSEE website offers publicly accessible information about purchasing carbon offsets for air travel, as well as a four-step process for how to do so. Currently, these resources are intended for individuals; travelers

can calculate the monetary equivalent of their carbon emissions and donate that amount to fund a verified sustainability project.

In addition to our efforts to inform the community about opportunities to offset carbon emissions, we hope to expand this individual offering into a concrete program with at least five participating campus units by FY24. This option would provide University business travelers with productive, tangible means of offsetting emissions, and encourage local action to increase awareness of and accountability for global issues.

We would especially like to incorporate creative local offset projects into this program. For example: an initiative to plant trees on designated South Farms (and/or on-campus) lands proportional to the amount of air travel undertaken by faculty and staff. Those who fly on a regular basis would be encouraged to volunteer their time to help plant trees, with student involvement welcomed as well. Participants would receive information regarding both the negative effects of carbon emissions and the sequestering abilities of trees and native plants.

Conclusion

Illinois students, faculty, and staff lead busy lives. By transitioning University-operated vehicles to alternative fuels, integrating sustainable management systems into campus roadways, and incentivizing active and low-emission commuting options, we are working diligently to shrink the portion of our carbon footprint made in transit. However, it is also imperative that the campus and community become active participants in our transportation plan.

Transportation solutions in particular come down to individuals' lifestyle choices: commuting by bus instead of single-occupancy vehicle (SOV); teleconferencing instead of traveling by plane; walking or biking rather than driving on campus. Regardless of role, each student, staff member, and faculty member is equally equipped to make a difference with their actions.

The sum total of individual contributions on campus — as well as an increased understanding of what influences decision-making in our community — will enable us to achieve our transportation goals in the coming years. No matter where our community needs to go, we strive to implement sustainable solutions to help them get there.

Chapter 4: Land & Water

Introduction

Functioning as a thriving micro-urban hub, robust research institute, agricultural living laboratory, and land-grant university, the University of Illinois at Urbana-Champaign acts as a microcosm for land and water management issues in the Midwest and globally. On local and large scales, these resources are indispensable for sustaining rapidly growing populations. However, they remain increasingly threatened by human development, biodiversity loss, and climate change. As our student body expands, we must act as cognizant stewards of the environmental resources for which we are responsible.

Our campus has an urgent responsibility to implement resilient landscapes with green infrastructure, ecosystem protection and restoration, and resource management — integrating sustainable practices into everything from the water we drink to the crops we harvest to the native plants and pollinators we rely on for survival. Also, as part of the University's strategies to achieve carbon neutrality, we must increase the amount of carbon sequestered by our soil and vegetation. The objectives of the Land & Water section are closely related to the sustainable development of communities and may involve the Resilience SWATeam (e.g., stormwater management plans).

The Boneyard Creek is a significant landmark for our community. It is a 3 mile waterway that flows through the campus and drains from the cities of Champaign and Urbana. The Boneyard Creek Master Plan was published in 2008 to strategize planning and maintenance efforts. Every year, the Boneyard Creek Community Day brings the community together to clean up litter and promote appreciation and responsibility of sustaining the creek. It also serves as a site for ongoing research studies, particularly for flooding patterns and water quality.

A major success story for Land & Water is the reduction in our campuswide potable (i.e., “drinkable”) water consumption. FY19 metrics reported a 37% decrease in annual potable water usage from the FY08 baseline.⁷⁴ We plan to continue this pattern over the next five years through a combination of innovative technology and water management strategies, minimizing excess potable water consumption indoors and outdoors alike — everywhere from bathroom faucets to agricultural irrigation systems. See Objective #4.1 for additional discussion of this target.

Notable achievements in sustainable land and water management from 2015 to 2019 include:

- In December 2019, the Resilient Grounds Strategy Advisory Committee — charged by F&S Executive Director Mohamed Attalla and chaired by Landscape Architecture Professor William Sullivan — completed a strategic vision for improving the overall

⁷⁴ <https://icap.sustainability.illinois.edu/project/reduce-potable-water-usage>

resilience of the campus landscape. The Resilient Landscape Strategy identified five key challenges that campus landscapes face and developed a set of solutions to meet these challenges. Implementing these solutions will ensure that our campus landscapes are designed and maintained in a fashion that is commensurate with our international world-class status.

- In March 2020, the University earned its fifth annual designation as an official [Tree Campus USA](#)⁷⁵ by the Arbor Day Foundation for its commitment to effective urban forestry. The standards for this designation include maintaining a Campus Tree Advisory Committee, establishing a campus [Tree Care Plan](#),⁷⁶ dedicating annual stewardship for the plan, performing a yearly Arbor Day observance, and developing a student service-learning project.
- An online [Tree Campus inventory](#)⁷⁷ was recently updated to document the campus's 16,487 trees. The database also tracks relevant annual metrics for campus trees, including: total greenhouse gas (GHG) sequestration (3,211,512.88 lbs CO₂); total water saved (17,413,976.33 gal); and total energy saved (2,024,564.13 kWh). Additionally, through efforts to implement 2015 iCAP objectives, the total agroforestry acreage on campus increased to 102.80 as of FY19.⁷⁸
- In October 2018, the U of I became Bee Campus USA certified, making it the first in the Big Ten Conference to do so.⁷⁹ The initiative was spearheaded by a student-run Bee Campus USA Committee in conjunction with the Department of Entomology, the Department of Natural Resources & Environmental Sciences (NRES), Extension, and F&S. Bee Campus USA is just one of several efforts at Illinois to foster a pollinator-friendly campus, and we will expand on these efforts moving forward. iCAP 2020 objectives include initiatives to increase native plantings, enhance low-mow zones, and restore native ecosystems on University-owned land, all to develop the best possible pollinator habitat. A citizen-science initiative, [I-Pollinate](#),⁸⁰ enables individuals to collect and submit relevant pollinator data.
- In early 2019, the Student Sustainability Committee funded work to begin monitoring nitrate-nitrogen in the Embarras River south of campus. This project was in direct alignment with a previous iCAP goal to reduce nitrate fertilizer losses by 50% from our farms. Initial monitoring equipment was installed by an undergraduate class in Fall 2019.
- In the summer of 2019, ACES farm staff started working to obtain specialized equipment to streamline the planting of cover crop seed during the fall harvest of corn and

75 <https://www.arborday.org/programs/treecampususa/>

76 https://www.fs.illinois.edu/docs/default-source/sustainability-docs/2019_tree_care_plan.pdf

77 <https://illinois.edu.treekeepersoftware.com>

78 <https://icap.sustainability.illinois.edu/project/carbon-sequestration>

79 <https://www.fs.illinois.edu/resources/newsroom/2018/10/25/u-of-i-becomes-the-first-big-ten-school-recognized-as-a-bee-campus-usa>

80 <https://ipollinate.illinois.edu>

soybeans. Adding a living cover over winter can substantially reduce both nitrogen and phosphorus losses to the environment.

- The [Red Oak Rain Garden](#) (RORG) has been a treasured installment on campus since 2006. During Campus Sustainability Week 2019, the RORG team unveiled plans for a three-tiered renovation project spanning the 2019-20 academic year. The oldest rain garden on campus captures and uses stormwater runoff while remaining an aesthetically pleasing installation for the campus community.
- In Spring 2020, iSEE began a small-scale composting program with funding from the Student Sustainability Committee (SSC) in the National Soybean Research Center (NSRC). This project will implement an on-site compost tumbler program to collect and sustainably dispose of food waste, coffee grounds, and shredded paper from offices in NSRC, where iSEE is housed. The next step of this project is to construct a pollinator garden on the west side of NSRC, which will be fertilized in part by the compost tumbler. In addition to reducing food waste, this project provides an educational opportunity for students, staff, and faculty, and will serve as an example for other University units.
- The Sustainable Student Farm began in 2009 as a joint project between the Student Sustainability Committee and the Department of Crop Sciences in the College of ACES, with substantial additional support from University Housing/Dining Services. The Farm produces high quality, delicious vegetables and fruits for consumption on-campus, primarily in University Housing. The Farm has also operated a Farm Stand on the Quad since 2011, and beginning this year, the Farm has opened an online store for the convenience of the campus community. The goal of the Farm is to educate students about the health, economic, and environmental benefits of local food production – all while getting great taste and flavor!

Further, we hope to mitigate the environmental consequences of our land management by improving the quality of water flowing downstream. By implementing agricultural conservation practices, much of the nutrient load being lost from our landscape can be reduced. The statewide Illinois Nutrient Loss Reduction Strategy⁸¹ was developed in collaboration with many faculty and staff from our campus. Reducing nutrient losses, particularly nitrate-nitrogen, also reduces nitrous oxide emissions from our waterways.

While we can take local and even statewide measures to prevent nitrate runoff, the impact of nutrient loss on water health is not limited to Champaign County, the State of Illinois, or even the contiguous United States. Should excess nitrogen exit South Farms soil and enter the local Embarrass River, the chemical could travel uninterrupted through the Mississippi River system and ultimately end up in the Gulf of Mexico. Once there, the fertilizers and pollutants contribute to a low-oxygen, high-mortality marine sector commonly referred to as the “dead zone.” The hazards of hypoxia in the Gulf are of such magnitude that the EPA’s Mississippi River/Gulf of

81 <https://www2.illinois.gov/epa/topics/water-quality/watershed-management/excess-nutrients/Pages/nutrient-loss-reduction-strategy.aspx>

Mexico Hypoxia Task Force aims for a 60% nitrogen reduction by 2035. Here in Urbana-Champaign, we can do our part by mitigating the excess fertilizer that travels over county and state lines.

In keeping with the thought-centric approach that drives this document, one of our overarching goals is to inspire a shift in public perception of the world around us: for example, transitioning away from the notion of *stormwater* as “disposable,” and instead toward a culture that values *rainwater* for its plethora of practical applications. Similarly, initiatives to educate the community and promote sites such as the RORG will aid in developing a rich culture that prioritizes and celebrates conscientious water conservation.

In addition to aesthetic and cultural appeal, we also need to improve campus landscapes for sustainability value. The two goals are integrally related — both human and environmental health stand to benefit from landscapes that are not only functional (i.e., capable of sequestering carbon, sustaining native species, and supporting pollinators), but also supportive of active human engagement with nature and the outdoors.

Land & Water Objectives

The following Land & Water objectives were developed by the SWATeams, iCAP Working Group, campus community, and Sustainability Council to guide the University's actions toward sustainable land and water management.

- 4.1 Reduce Water Consumption**
- 4.2 Implement Resilient Landscape Strategy**
 - 4.2.1 Increase Number of Trees**
 - 4.2.2 Increase Pollinator Friendly Areas**
 - 4.2.3 Double Green Infrastructure Installations**
- 4.3 Cover Crops on South Farms**
- 4.4 Monitor Soil Health**

#4.1 [F&S] Reduce potable water consumption to 721,500 kgal/year by FY24, which is a reduction of 45% from the FY08 baseline.

Potable water refers to water that is safe to drink — a scarce commodity in developing regions, and one that is growing increasingly precious worldwide. On campus, we are implementing infrastructure to conserve potable water used for purposes other than drinking, such as sinks, faucets, toilet fixtures, plumbing, cooling, and irrigation. We plan to continue studying the feasibility of water reuse in bathrooms. In FY19, campus used 823,049 kgal of water (Figure

17); to further reduce potable water usage, we aim to increase the cycles of concentration for cooling process water, especially at Petascale and possibly at Abbott Power Plant.

We have [reduced potable water consumption by 37% from the FY08 baseline as of FY19](#) (Figure 18).⁸² To reduce consumption by a further 3% over the next four years, we are focusing on the two largest sources of excess water usage: campus buildings and agricultural irrigation.

Total Potable Water Use (kgal)
Tracked by Fiscal Year

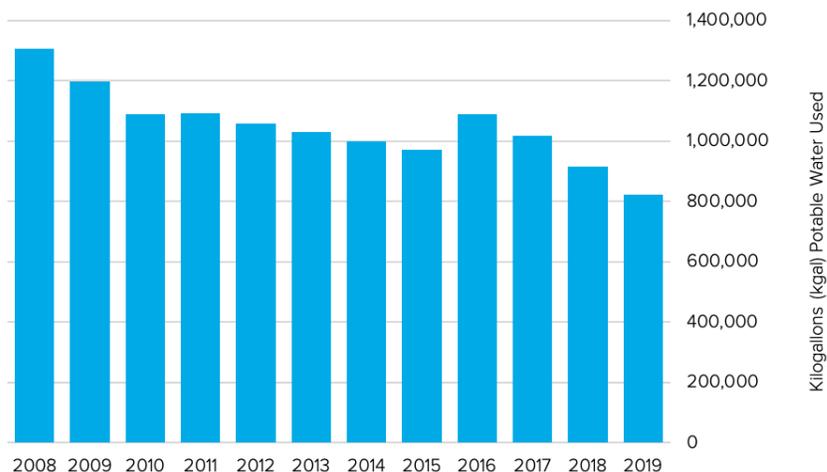
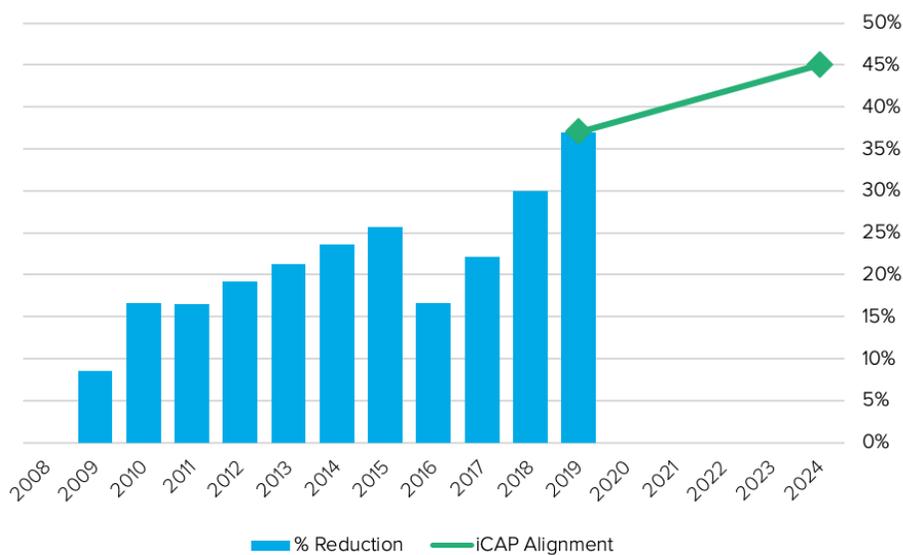


Figure 17: Total Potable Water Used on Campus

Percent Reduction in Potable Water Consumption
Tracked by Fiscal Year



⁸² <https://icap.sustainability.illinois.edu/project/reduce-potable-water-usage>

Figure 18: Percent Reduction in Potable Water Consumption

Water Consumption in Campus Buildings

Restrooms in campus facilities are a common source of water inefficiency, as any plumbing fixtures are not updated to use current water conservation technology. Previous sustainability projects have addressed this issue by updating campus facilities with “low-flow” fixtures. As of FY19, there are approximately 1,100 lavatories that need to be converted to low flow, about 500 urinals that are currently using 1.0 gallon per flush (GPF) (rather than the low flow urinals that use 0.5 GPF or 0.125 GPF), and approximately 1,100 toilets using 3 gallons or more per flush. The more efficient flush rates get as low as 1 GPF in newer campus facilities.

It is difficult to retrofit existing fixtures, though we plan to continuously research water reuse techniques and require low-flow fixtures in all new construction. The Building Maintenance team at F&S is compiling an inventory of buildings that do not have low-flow fixtures in the restrooms. When this inventory is complete, we plan to identify the buildings with the most fixtures to retrofit and seek funding for implementing these water efficiency improvements.

In addition to these upgrades, we will launch a campaign to communicate water conservation best practices to building occupants — students, faculty, staff, and Building Service Workers. Implementing metered water consumption will bring awareness to the rate and volume at which individual campus buildings consume water, and it will encourage individuals to make decisions cognizant of the iCAP objectives.

Agricultural Water Usage

Agricultural research is central to our University’s mission. However, even though a small fraction of the 3,300 acres devoted to crop cultivation requires irrigation, water use volumes are staggering. For example, a 40-acre field irrigated with 10 inches of water per year requires over 10 million gallons. To achieve a 45% potable water use reduction, University-owned land that is being irrigated must be taken off of municipal water sources and transitioned to wells or reclaimed water sources, depending on research needs.

In addition to reducing potable water use for irrigation, we plan to develop a strategy to optimize a second critical element of the University’s agricultural research: the equipment. It is not uncommon for University-owned equipment to use a “once-through” system for cooling — as its name implies, the (often potable) water used for cooling has a brief lifespan, passing through the machines just a single time before being discharged as “wastewater.” This process is needlessly inefficient, and even more so on a large scale. After identifying which equipment relies on once-through cooling systems, we will explore ways that these processes can be redesigned to incorporate more sustainable practices.

#4.2 [F&S] Implement the Resilient Landscape Strategy recommendations by FY24.

At the University of Illinois at Urbana-Champaign, campus landscapes are our habitats: the places where we work, relax, and engage with others. Campus landscapes sustain us. They clean our air, beautify our surroundings, sequester carbon, and provide us with motivation and inspiration. Campus landscapes are as essential to our health and wellbeing as any

brick and mortar infrastructure, and yet we often act as if the spaces between the buildings don't matter. With proper design and direction, our campus landscapes can become multi-functional spaces that support teaching and research activities, promote the wellbeing of our campus community, and contribute to our economic success by drawing new students and donors to our doors.

We have an obligation to steward and maintain our landscapes in sustainable ways, to reflect upon the past to envision a healthier, more resilient future. Our campus landscapes must be future-focused, able to withstand and recover quickly from the challenges of tomorrow: climate change, large storm events, and heavy use by tens of thousands of individuals.

An Adopt-a-Pathway program currently exists though is not promoted. In the coming five years, we aim to relaunch the program. University departments, clubs, and organizations will have the opportunity to “adopt” sections of campus walking paths and take on the responsibilities of litter removal, plant watering and weeding, and maintaining overall aesthetics.

The Resilient Landscape Strategy is organized around five key challenges: lack of a Landscape Master Plan, an unclear decision-making structure, lack of resilient rainwater management, an inadequately resourced Grounds Department, and inconsistent funding for landscape improvements.

Studies have shown that increased visibility of greenery has positive impacts on students' attention, stress, and overall mental wellness. The Resilient Landscape Strategy has already begun to address campus landscape health and its ability to motivate and sustain our community. In order for everyone to enjoy the restorative effects of nature, the University will work to increase the amount and visibility of natural landscapes so that they can be enjoyed from anywhere on campus. As an effort to utilize and improve our existing space with added greenery and natural lighting would function as an indoor “sunroom”. This would serve as a positive environment for studying, working, or reflecting, and would also exist as a space to host mental health workshops. As we work to add more indoor green rooms on campus, an online inventory would be made available to the public to promote the location of these green spaces.

Additionally, identifying a walking path with plants on North and central campus would provide an opportunity for people to self-tour and learn about the plant species on our campus.

Landscape Master Plan

While the 2017 Campus Master Plan provides an overall vision for a sustainable campus, the plan prioritizes buildings over landscapes. There is no cohesive, shared vision for resilient campus landscapes and limited guidelines for ensuring landscapes' long-term success. F&S is now working to develop a Landscape Master Plan that includes a shared vision for the overall campus landscape and specific design guidelines. This will include establishing a steering committee, hiring an external landscape architecture firm, and initiating extensive public and stakeholder engagement.

Decision-making Structure

Too many people feel they have authority over landscape decisions, leading to disjointed designs and unsustainable development. The University Landscape Architect's (ULA) authority over campus landscapes is compromised by an unclear authority and reporting structure and an uninformed appeals process. F&S is working to establish a Campus Landscapes department, clarify the role of the ULA, and provide appropriate resources for informed decision-making.

There also needs to be a landscape design appeals process outside of the standard capital programs variance process. Landscape and site projects that the ULA determines do not align with the Landscape Master Plan will adhere to this process for approval. The landscape design appeals committee will include faculty, students, administrative staff, and representation from the Native American community, in keeping with the campus commitment to work with Native Nations.⁸³

Rainwater Management Plan

The conditions and standards for managing rainwater on campus are out of date, leading to flooding and creating opportunities for pollutants to contaminate our local waterways. Instead of being protected and utilized as a resource, rainwater is whisked away. To remedy this, we will require Best Management Practices (BMPs) for rainwater management in core campus areas and agricultural lands, and develop and follow a comprehensive Rainwater Management Plan.

In addition to implementing policy, we intend to increase opportunities for education and engagement for Grounds employees as well as the Illinois community. We will also initiate a recurring student design competition for resilient landscape designs, and fund implementation of winning submissions.

Resources for F&S Grounds Department

Campus landscapes and open spaces have been marginalized and simplified, leading to an overall loss of aesthetic value. Staff levels, equipment, and facilities are insufficient to maintain a high degree of resiliency for our campus landscape. To improve the aesthetic and environmental functionality of our campus, we must increase the F&S Grounds staffing complement, including additional Grounds workers; reinstate the Grounds Gardener, Horticulturist, and Tree Assistant positions; and hire an Ecologist. We also need to train Grounds employees, both at F&S and for all units with Grounds staff, and provide appropriate equipment and facilities to relevant units.

Funding for Landscape Improvements

Campus landscape improvements are most often funded as part of capital building projects, but the site improvements are often the first to be cut when budgets are tight. We need a way to protect capital project funding for landscape improvements and to ensure adequate funding for landscape improvements beyond capital projects. Currently, little direct funding and donor support is expressly for landscape improvements. We intend to earmark capital project funding for landscapes, develop a rainwater management fee, and develop annual funding for landscape improvements. We will prioritize efforts to seek donor funding as well.

83 See page 13 of the Resilient Landscape Strategy, <https://fs.illinois.edu/services/grounds/resilient-landscape-strategy>

#4.2.1. [F&S] Increase the number of trees on campus by 1,500 by FY24 and by 3,000 by FY30.

Campus has 16,487 trees, as calculated by our online [Tree Campus inventory](#).⁸⁴ By FY24, we aim to increase this number planting an additional 1,500 trees in the next five years and planting another 1,500 trees by FY30. The additional trees will not only boost aesthetic appeal, but will aid in greenhouse gas (GHG) sequestration and avoidance, water management, and financial savings for campus. We also work to maintain the 10-20-30 diversity rule, that urban forests should have no more than 10% of any single species, no more than 20% of any single genus, and no more than 30% of any single family. As of 2019, 187 species, 74 genera, and 38 families are represented on the Illinois campus.

A critical step to increasing the abundance and visibility of trees on campus is maintaining annual recertification as a Tree Campus USA®. In addition to anchoring the logistical and financial framework needed to foster a tree-friendly environment, the program's five standards provide a pathway toward increased visibility and public awareness of our arboreal assets. It also includes key goals for improving our urban forest, such as "Initiate a service learning project to calculate the tree canopy coverage."

#4.2.2 [F&S] Increase the number of ground-level pollinator-friendly landscaping areas on campus by 50% from the FY19 baseline by April 2024.

As of FY19, the campus supported 26 ground-level pollinator-friendly landscaping areas. These are documented on the [Pollinator Supportive Landscape Map](#)⁸⁵, which is updated each spring before the April Earth Month celebrations.⁸⁶ By April 2024, we plan to increase this number by 50%, resulting in at least 39 ground-level pollinator supportive areas. In addition, green roofs on several campus buildings often support pollinators.

Maintain Bee Campus USA Status

By maintaining our Bee Campus USA status, we will foster a pollinator- (not just bee-) friendly campus. These efforts will also support sustainable food production, encourage native plant propagation, encourage awareness of pollinator-friendly best practices, and create a viable habitat for the creatures dependent on pollinators for survival (including humans!).

Enhancing low-mow zones

In 2010, F&S established "low-mow zones"⁸⁷ to increase pollinator support and decrease maintenance costs. Cutting low-mow zones intermittently lessens the seed production from weeds and non-native plants, an essential process for preserving high-quality native perennial biodiversity and minimizing invasive species.

84 Statistics taken on March 17, 2020.

85 <https://icap.sustainability.illinois.edu/project-update/pollinator-pocket-map-created>

86 An interactive version is available through Google Maps: <https://www.google.com/maps/d/u/0/viewer?ll=40.099585560733175%2C-88.22811205&z=15&mid=1pfcy-wlJ5tCUieFYTB-IL7etlTIsJW>

87 <https://icap.sustainability.illinois.edu/project/low-mow-zones>

Currently, we have 81.8 acres of low-mow land on University property and 5.7 acres of prairie plantings. Moving forward, we intend to convert a portion of the low-mow acreage into prairie or meadow, with an emphasis on pollinator support and native plantings.

Student Involvement

Student participation is necessary to increase the amount of pollinator-friendly areas on campus. In addition to the Bee Campus Committee, there are several Registered Student Organizations (RSO) dedicated to this effort.

Red Bison is one RSO that works on ecosystem restoration projects. They currently manage two active restoration areas on campus: Florida Ave. Prairie (which will eventually become a tallgrass prairie) and the South Arboretum Woods (SAW), which will be prairie, oak savanna, and oak-hickory woodland. Red Bison is also studying the possibility of restoring the area around the Dorner Pond to a bottomland forest-type ecosystem. Pollinators, especially migrating monarchs, often frequent these sites.

Additionally, From the Ground Up is a group that focuses on student-led sustainability projects. In Fall 2019, From the Ground Up acquired 3.9 acres of a previously designated Low-Mow Area near the Orchard Downs Housing Facility. The group plans to transform this plot of land into a pollinator-friendly native Illinois flower garden. Additionally, From the Ground Up started the Foreign Language Building Garden Renovation Project in early 2020 with the support of the Student Sustainability Committee to plant native wildflowers, pollinator-supportive plants, and possibly bird and bee habitats around this building. This group works to raise awareness surrounding the modern problems afflicting pollinator populations, and has recently added an education component to their mission. They will teach lessons and facilitate conversations about sustainability and landscape health in the public schools of Champaign and Urbana.

#4.2.3 [F&S] Double the number of on-campus green infrastructure installations from 24 to 48 by FY24.

Green infrastructure refers to stormwater management practices that protect, restore, or mimic the natural water cycle, per the National Green Infrastructure Certification Program (NGICP). They are biologically based stormwater treatment areas that clean stormwater as well as reduce erosive forces occurring due to runoff. Trees and vegetation are often, but not always, used in green infrastructure. We currently have 24 green infrastructure installations on campus. These include permeable pavement, green roofs, rain barrels, and bioswales (vegetation-filled trenches designed to capture and filter runoff).

By FY24, we aim to double the number of green infrastructure areas, in addition to maintaining the quality of our current projects. Ideally, the new installations would be spread out evenly, so that all existing efforts would be doubled. Examples of how we will add quality and functionality to our existing installations are included below:

Green Roofs

Currently, the campus has 9 green roofs, planted on buildings such as Krannert Center for the Performing Arts, the Business Instructional Facility (BIF), and the Art and Design Building.

Green roofs, which are plantings on a portion of the roof area, are valuable for reducing rain runoff as well as the impact of heat on the building HVAC systems. We will also augment these many benefits with another: planting native landscapes on green roofs to support pollinators. Future buildings and major remodels will also consider including green roofs, such as the renovation of the Illinois Street Residence Hall (ISR).

Rain Barrels

By working to seamlessly integrate natural rainfall into our campus's small-scale irrigation practices, rain barrels act as "green infrastructure."

To aid in our water conservation efforts, we could increase the use of rain barrels and subsequently phase out the use of sprinklers in University-owned spaces. Rain barrels capture rainwater for eventual reuse, thus reducing the volume of runoff and associated water pollution that commonly follow heavy rain. Also, using rain barrels reduces the volume of drinkable water unnecessarily dispensed for irrigation, allowing for that valuable resource to be rationed and redistributed elsewhere.

Rain barrels could be installed at each pollinator pocket on campus. Currently, this is being implemented at the Idea Garden, and in conjunction with the pollinator gardens near Davenport Hall.

#4.3 [ACES] Use cover crops in at least 20% of South Farms acreage by FY24.

The South Farms, part of the Crop Science Research and Education Center, is located south of the Florida Avenue campus border and encompasses approximately 3,343 acres operated by departments within the College of Agricultural, Consumer, and Environmental Sciences (ACES). Crop Sciences (which includes the 321.3-acre Energy Farm) and Animal Sciences are responsible for the largest portions of South Farms land (roughly 50% and 45%, respectively), while the remainder is devoted to Agricultural & Biological Engineering, the College of Veterinary Medicine, aquaculture research, and forestry.

This large parcel of land should be cultivated in the most efficient way possible — with respect to the environment, economy, and scientific research. A proven avenue for advancing these goals is planting cover crops (e.g., rye). These quick-to-cultivate crops help reduce soil erosion and add valuable nutrients back into the soil. Currently, all cover crop use on the South Farms is in service of research projects, totaling less than 20 acres. Moving forward, we plan to plant cover crops on 20% of South Farms acreage, which would increase this number to approximately 668 acres. The target of 20% represents an ambitious yet achievable goal that balances the capabilities of South Farms personnel with the potential benefits of University support. All departments within ACES will be encouraged to plant cover crops on land parcels.

This effort goes hand-in-hand with larger ongoing ACES efforts to incorporate agricultural conservation practices on all University-operated farmland, for example, cover crops and soil erosion monitoring. In 2018, the ALUFS SWATeam submitted a recommendation to the iWG. This recommendation stated that a comprehensive and cooperative management plan for all

non-research agricultural land on South Farms should be developed to promote sustainable practice and implement current best management practices. Efforts will continue to develop this plan in the next five years.

One of the most significant considerations to fully implementing this objective is obtaining and maintaining the necessary equipment. Several methods can be used to plant cover crops, all of which will require either refurbishing old equipment (e.g., the grain drills owned by Crop Sciences and Animal Sciences, which are a viable option for planting) or buying new. For example: should the campus pursue interseeding — a time-advantageous method typically implemented in late summer, wherein cover crops are seeded while primary crops are in mid-growth — we would likely need to invest in a high-clearance sprayer (a piece of machinery used for fertilizer and other nutrient application) retrofitted with an air seeder (which would distribute cover crop seeds in tandem with the sprayer). While this equipment would certainly have multiple other agricultural uses, it is not currently owned by the University.

To best serve our research faculty and scientists, the use of cover crops should be coordinated with health tracking and monitoring of our soil and water.

#4.4 [ACES] Monitor soil health by collecting soil analyses for all South Farms land parcels, using the LabCore System, by FY24.

As we take steps such as planting cover crops to improve soil health, enhance farm sustainability, and add a layer of resiliency to our system, we must establish a unified system to *monitor* soil quality, ensuring that we are either implementing productive solutions or making informed decisions to reorient our approach. In other words, we need to be able to adaptively manage moving forward.

As is the case for many of our iCAP objectives, data analysis begins with data collection. For this objective, our key metric is related to the quantity of land parcels for which we are able to accrue accurate soil measurements. Two options for achieving this objective are outlined below:

Collect Soil Samples using LabCore

Many University of Illinois scientists and researchers regularly take soil samples from South Farms fields to aid in their research. The most efficient method for compiling these data into LabCore — a pre-existing farm data collection, archiving, and GIS platform — might involve soliciting relevant data from those individuals.

If submitters are able to provide georeferenced points describing the original site of their sample, that information could be used to create comprehensive maps to augment the standard USDA Soil Survey data typically used. This would also allow tracking of critical soil organic matter pivotal in sequestering carbon. In addition to providing a real-time aerial overview of soil health across the South Farms, implementing an existing GIS platform in this way allows geographical tracking of any activities that might influence soil health. Over time, this would allow novel correlations to be developed, linking soil health to carbon reductions.

Equally important to collecting soil samples is creating a publicly accessible hub for that information. Just as scientists are able to contribute data into the system at no cost, they would

similarly be able to access the data through this non-proprietary system. Ideally, a potential result of using LabCore is an expedited and minimized need for arduous field research to manually obtain soil samples.

Tile Drainage with Soil Analytics Capabilities

A second method for collecting soil health data, and subsequently conducting soil analyses, is installing a tile drainage system with a soil analytics component. While some plots currently have this system, the locations could be expanded.

There are certain plots at the University of Illinois Energy Farm currently in possession of such tile systems: these monitor nitrate loss and collect aggregated soil nutrient information. We propose to replicate some of these strategies at diverse locations throughout the South Farms (e.g., distributed in fields conventionally tilled or no-till; with or without cover crops; annual or perennial crops, etc.) to compare nutrient loss based on management style. The tiles would be located on the edges of their respective farms, so that nutrient loss *out of* our South Farms boundaries (and *into* critical waterways, for example) can be diligently observed. This approach aligns with previous iCAP goals, and would allow quantification of land management changes as well as the impact of changing rainfall patterns over time.

Ultimately, the actions implemented to achieve this objective will build a strong foundation for the campus's Nutrient Loss Reduction Strategy: our long-term plan to optimize the nutrients (e.g., nitrogen) regularly applied to our crops to prevent excess and avoid chemical runoff into the nearby Embarras River and connected waterways across the United States. The interconnectedness of statewide, national, and global land and water systems is proof that public, private, and University-operated agricultural units must act as a unit to address widespread health concerns in soil and water. As a leader in the development of novel agricultural management and technological approaches, the University of Illinois is poised to provide a "pilot program" in our nutrient loss reduction efforts, and provide a model for sustainable land management that other agricultural communities can apply to their own practices.

Conclusion

Humans are intimately linked to the land and water that surround them. At the University of Illinois, we are each affected by our access to these resources on a daily basis — whether it takes the form of strolling through the Main Quad on a sunny day, struggling to prop open an umbrella on a rainy walk to class, or sipping water from a drinking fountain. Like many aspects of sustainability, the most effective step toward enacting big-picture land and water management strategies is connecting with individuals on scales as small as the simple actions listed above, and nurturing curiosity about the ways in which land and water factor into the everyday.

As one of the nation's land-grant universities, the University is situated on more than 5,000 total acres. While we are fortunate to occupy this expansive space, it's important to keep in mind that the land and water we possess — and that which exists in the world at large — is finite.

The University's physical size and wealth of resources pose unique challenges. However, they also afford exciting opportunities to enact progressive environmental change on both individual and institutional scales. This is a great responsibility, and one not taken lightly. Through innovative infrastructure, adaptive strategy implementation, and data-driven land use policies, we will strive to become a pillar of ethical land and water management in the coming decades.

DRAFT

Chapter 5: Zero Waste

Introduction

The Zero Waste International Alliance (ZWIA) defines “zero waste” as “the conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health.”⁸⁸

Put differently, the goods and services we purchase — and the ways in which we interact with them — influence everything from the size of landfills to the release of harmful greenhouse gases (GHG) into the atmosphere. By investigating a resource’s lifecycle (i.e., a “whole system” approach), we can learn how to minimize energy usage across all stages, from raw material extraction and transportation to waste disposal.

The University’s first significant step toward reducing emissions from landfill waste occurred in 2009, when we began sending landfill waste to a site in Danville, Ill. which recovers methane emissions for electricity generation. The campus had previously sent landfill waste to a non-recovering site in Clinton, Ill. According to the GHG calculator, SIMAP, this change resulted in a 101% emissions decline from FY08 to FY09. We recently modified the calculator to be more accurate; instead of a negative number as calculated in previous years, emissions from solid waste were approximately 475 MTCO_{2e} in FY19.

In 2015, Karin Hodgin Jones, former student member on the Purchasing, Waste, and Recycling (PWR) SWATeam and current lecturer in the School of Art + Design, investigated University landfill emissions using publicly available data from the Environmental Protection Agency (EPA). With her data, the GHG emissions from landfill waste should be recalculated to show 2,314 tons in FY08 and 510 tons in FY14.⁸⁹

While little progress has been made since that time, we have used the last five years to lay the necessary groundwork for moving toward zero waste in the years to come.

Notable achievements in zero waste from 2015 to 2019 include:

- In July 2017, the Purchasing Office began reporting directly to the Chancellor instead of to the System Office, as was previously the case. This change better equips campus to execute targeted improvements in this area.
- In FY19, F&S set in motion a phased modernization and upgrade program geared toward meeting campus’ zero waste goal. Projects included: installing 162 new standardized indoor recycling stations to increase collection; improving collection routes

⁸⁸ Updated by the ZWIA as of December 2018. <http://zwia.org/zero-waste-definition/>

⁸⁹ https://icap.sustainability.illinois.edu/files/project/3114/Landfill_Emissions_Raw_Data.xlsx

to build recycling capacity; installing on-truck scales for effective tracking; and providing tours and educational sessions at the Waste Transfer Station to increase engagement.

- Employing dedicated staff members is critical to ensuring that University waste management policies receive the expert attention they deserve. In January 2020, F&S hired a Zero Waste Coordinator. The key responsibility for this position is transitioning campus to a zero-waste community with an emphasis on operations.
- University Housing has had particular success regarding food waste in campus dining halls. With food scraps comprising the highest percentage of landfilled municipal solid waste (MSW) in the state of Illinois (17.5%),⁹⁰ extending such efforts to other units remains critical.

Purchasing and procurement standards remain a major challenge at Illinois, as campus policies are not always well-known, used, or enforced. As of FY17, the campus reported purchasing 19.13% recycled-content paper from OfficeMax as compared with the 2015 target of 50% by FY20 (Figure 19).⁹¹ iCAP 2020 includes objectives to not only implement a transparent procurement reporting program, but also to address the issue at its source by holding high-level business officers accountable for making environmentally conscious purchasing decisions.

Percent Recycled-Content Paper Purchased from OfficeMax
Tracked by Fiscal Year

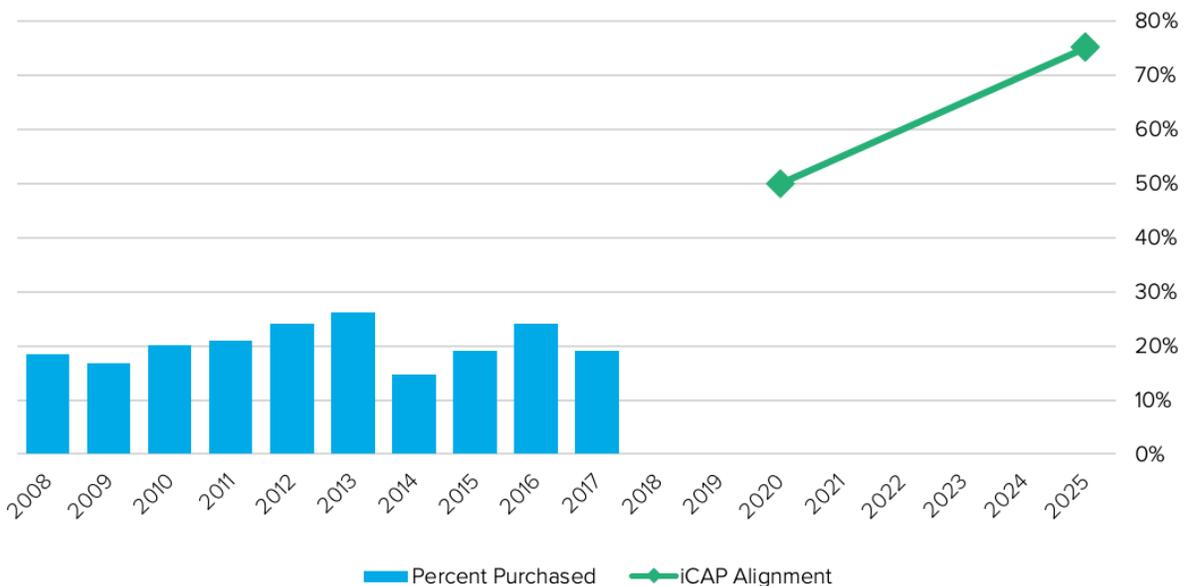


Figure 19: Percent Recycled-Content Paper Purchased from OfficeMax

⁹⁰ <https://www.illinoisrecycles.org/wp-content/uploads/2014/10/2015-Waste-Characterization-Update-FINAL.pdf>

⁹¹ <https://icap.sustainability.illinois.edu/metric/61-percent-paper-purchased-officemax-recycled-content>

The 2015 iCAP also set the ambitious goal of increasing our MSW diversion rate (i.e., the percentage of everyday garbage kept out of landfills each year) to 45% by FY20 (Figure 20). As of FY19, this metric was measured at 27.40%. Rather than tracking the diversion rate alone, however, we are now focusing on the more important objective of reducing the volume of landfilled waste each year.

Municipal Solid Waste (MSW) Diversion Rate *Tracked by Fiscal Year*

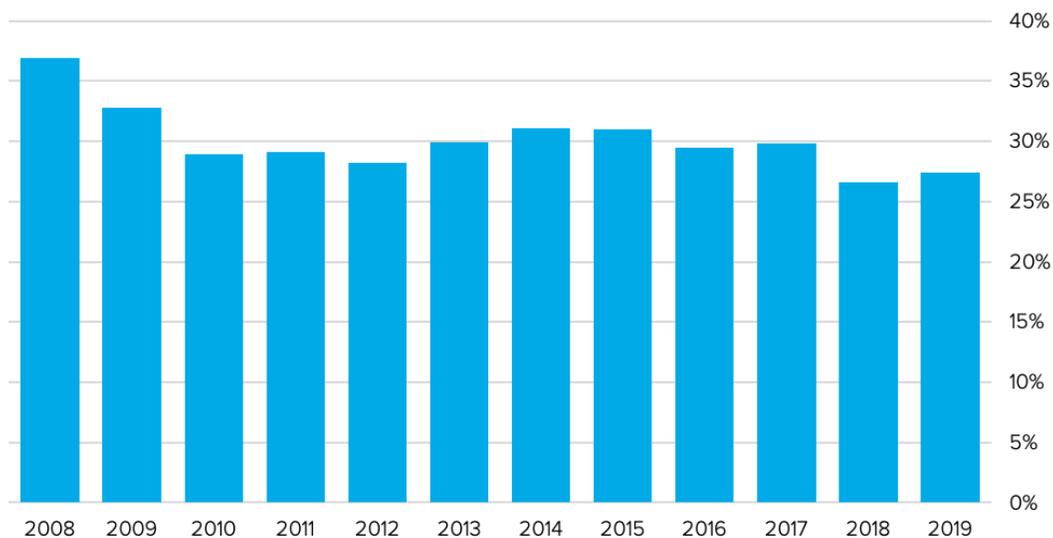


Figure 20: Municipal Solid Waste (MSW) Diversion Rate

A comprehensive behavioral shift for all students, faculty, staff, and visitors is integral to mitigating our waste stream. Our central vision is to promote a zero-waste culture on campus by empowering individuals and units to take responsibility for everything from purchasing to waste reduction. In April 2020, the Student Sustainability Committee approved funding for the University of Illinois to become a member school of the Post Land Action Network (PLAN). In addition to providing a network with resources to assist in our zero waste efforts, they offered a fellowship opportunity to a student during the summer of 2020. This fellowship opportunity is designed to help with benchmarking our waste goals and collaborating with stakeholders to identify how we can improve our waste diversion efforts beyond behavior change campaigns.

Vital to this process are actionable steps such as: providing education about “reduce, reuse, and recycle” concepts; clearly communicating best practices to be implemented and shared; and investing in our facilities (e.g., indoor and outdoor recycling bins). Ultimately, we strive to build a community of students, employees, and visitors both cognizant of waste management and committed to reducing waste.

Zero Waste Objectives

The following Zero Waste objectives were developed by the SWATeams, iCAP Working Group, campus community, and Sustainability Council to guide the University's actions toward achieving zero waste and fostering a conscientious consumer culture.

- 5.1 Sustainable Procurement Reports**
- 5.2 Reduce Landfilled Waste**
 - 5.2.1 Install Appropriate Infrastructure**
- 5.3 Establish a Culture of Reuse**
 - 5.3.1 Zero Waste Messaging Campaign**
- 5.4 Reduce Food Scraps**
- 5.5 Plan for Organic Waste**
- 5.6 Use Local Food**
 - 5.6.1 Food Literacy Project**
- 5.7 Green Cleaning Program**

#5.1 [Purchasing] Increase understanding of and compliance with sustainable procurement requirements, with 100% of business managers completing an annual sustainable procurement report by FY24.

“Procurement” refers to locating and obtaining goods and services from an outside vendor — everything from food products, to printer paper, to public computers in University labs. Speaking in terms of a “whole system” approach, procurement is one of the earliest lifecycle stages over which we have direct control. The sources we select for campus purchasing are some of the most powerful sustainability “votes” we cast.

When given the opportunity, people will usually opt for sustainable sourcing. However, a core issue regarding sustainable procurement at a university of this size is the lack of coordinated communication within the network of people making buying decisions for campus. Drafting an annual report to be completed by business managers will ensure that information about sustainable procurement is compiled, disseminated, and distributed to those who have the power to cast the most environmentally conscious “vote.”

Sustainable Procurement Reporting Program

Working closely with the Business Managers Group, we aim to implement a sustainable procurement reporting program by FY23. By FY24, we plan for all campus business managers to participate in this annual program.

Reports may include metrics such as: percent of environmentally preferred purchases of products like office paper, cleaning products, computers, electronics, and package delivery services; percent of purchases made through [iBuy](https://www.obfs.uillinois.edu/iBuy)⁹² (the “online marketplace for purchasing

⁹² <https://www.obfs.uillinois.edu/iBuy>

goods and services at the University of Illinois System”); and the number of vendor contracts including sustainability requirements.

iBuy

Increasing the percentage of purchases made through iBuy will elevate the overall sustainability of our campus processes. Because all purchasing through this marketplace occurs online, favoring iBuy will drastically decrease the waste stream typically generated from purchasing.

Purchase Orders (PO) through Banner have historically been printed and mailed to vendors, a process that generates large quantities of waste from paper, toner, postage, and delivery. From FY17 to FY19, the average annual number of POs in Banner exceeded 7,500; a conservative estimate of 10 pages per PO calculates over 75,000 sheets of paper used per year. Alternatively, using iBuy can conserve waste, cut costs, and minimize the emissions generated from producing items like office paper.

Recently, the Purchasing Office has made focused efforts toward shifting purchases from Banner to iBuy; from FY17 to FY19, over 2,700 POs were completed using the electronic marketplace. Moving forward, functional updates will enable a higher volume of POs to be routed through iBuy. These include:

- Addition of Contracts Plus — Historically, Banner was the only channel for submitting purchase orders tied to a solicitation or contract. Adding Contracts Plus enables these purchases to be made through iBuy, eventually replacing the Illinois Contract System (ICS) and consolidating contracted and solicited orders.
- Ability to process Standing Purchase Orders — Standing POs allow units to order qualifying items on an as-needed basis (e.g., lab supplies that are frequently replenished). Although iBuy does not yet possess the capability to process Standing POs, this feature is expected by FY21. In FY19, more than 3,000 Standing POs were processed in Banner; while not all of these will immediately transition to iBuy, a substantial reduction is expected by FY21.
- America To Go (ATG) punch out catalog — Punch out catalogs allow buyers to directly access supplier catalogs from within the purchasing platform. Currently, the University spends approximately \$10 million per year on restaurant and catering orders from Banner, iBuy, Purchasing Cards (PCards), and Travel Cards (TCards). The majority of these purchases are from Banner and TCards. By streamlining access to ATG (which provides a curated network of restaurant and catering vendors), we can reduce the volume of orders processed through Banner and digitize our ordering practices.

Campus Contracts

Every campus department and office engages in procurement. Numerous campus professionals' positions require frequent and thoughtful vendor interactions; these individuals negotiate everything from day-to-day office supply purchasing to more expensive orders including electronics and catering. Though each department has different requirements, all can incorporate sustainability into their purchasing choices. In addition to a sustainable procurement

reporting program, we want to integrate sustainability components into relevant professionals' job descriptions and contracts.

The purpose of the reporting program outlined in this objective is to integrate green purchasing into all facets of campus. The reporting itself is a necessary step; the ultimate goal is to foster a campus culture of environmentally conscious decision-makers. Only through coordinated communication and diligent reporting can we hope to tackle this problem as a campus.

#5.2 [F&S] Reduce the total campus waste going to landfills by at least 10% from the FY19 baseline of 5,049 tons by FY24.

Establishing sustainable procurement practices will play a significant role in reducing the volume of single-use items used on campus. However, a large volume of waste from individuals and offices alike nevertheless fill campus garbage and recycling bins.

In FY19, the University of Illinois at Urbana-Champaign (including the South Farms) generated 5,049 tons of waste — the combined weight of 1,000 Alma Mater statues. With an improved waste collection infrastructure, we plan to cut this amount by 10%, to equal 4,544 tons per year, by FY24.

Our strategy for achieving this objective is contingent upon determining the largest waste-producers on campus and targeting our reduction efforts to those particular locations. Using pick-up data from waste collection trucks, we can identify the top five waste-producing buildings and provide “reduce, reuse, and recycle” training to their units. To incentivize waste reduction, we will also explore options for buildings, businesses, commercial areas, and other organizations to compete for producing the least total amount of waste.

In addition to minimizing waste generated by buildings and their units, we plan to explore innovative, research-based solutions that take advantage of the University's network of expert investigators and its ability to function as a “living laboratory.”

#5.2.1. [F&S] Install appropriate waste collection infrastructure throughout the University District, with new indoor bins placed in at least 150 buildings by FY24.

One of the clearest indicators of a unified waste collection infrastructure is the physical appearance of our indoor and outdoor bins. In addition to performing a vital function, our waste and recycling receptacles symbolize the time, attention, and resources devoted to campus sustainability.

By renovating and improving the presentation of our bins, we will be able to ensure that we are capitalizing on every available opportunity to recycle, and that waste that must be disposed of is handled correctly. This will also provide a visible signal to students, staff, faculty, and visitors that our campus prioritizes sustainability and is committed to making zero-waste behaviors accessible to all.

To operationalize a formally designed, campuswide waste collection plan, we first need to develop a Facilities Standard for indoor and outdoor waste management containers.

Indoor Bins

We plan to place new indoor bins in at least 150 campus buildings by FY24. This step would ideally be completed as soon as possible, beginning with an inventory of existing bins, including: current locations in campus buildings and facilities, quality status, and where additional bins are needed. Based on that data, we will evaluate funding solutions for completing this plan by the target year, focusing specifically on installations for new and retrofitted buildings.

In addition to standard areas (e.g., academic buildings and high-trafficked hubs such as the Illini Union), we want to ensure that waste diversion opportunities exist in less-trafficked locations such as mail rooms, copy rooms, break rooms in campus offices, and department kitchens.

Outdoor Bins

Outdoor bins often require high levels of coordination to install. Our anticipated timeline for renovating and updating these bins in the coming years is outlined below:

- By FY22, we will complete updates to existing outdoor bins, including improvements to labeling and signage.
- By FY24, we will finalize optimizing Dumpster locations and their collection process.
- By FY25, we will incorporate drop-off bins specifically for cardboard in various locations on campus and disseminate a list of where these are located.

Tailgates

Tailgates pose a unique challenge for waste collection: the high volume of individuals, reliance on disposable materials (e.g., single-use food service items), and lack of adequate receptacles over acres of space result in large quantities of landfill waste.

We propose that at all tailgating parties, Blue Recycling Bags be distributed so tailgaters can separate their aluminum, cardboard, and plastics from general waste: individually, efficiently, and on-site. Individuals will deposit the Blue Recycling Bags alongside the usual waste containers, and the recycling truck will pick them up after the event.

Special Recyclables

In addition to commonly recycled items such as paper, plastic, and cardboard, we want to provide our community with easy-to-understand programs to recycle specialized materials such as non-rechargeable batteries, glass, electronics, and industrial waste produced on campus (e.g., vehicle batteries, scrap metal, wires, concrete, tires, etc.). Overwhelmingly, we've found that individuals are willing to take steps to recycle items responsibly when they are presented with resources and actionable ways in which to do so.

The Illini Union Bookstore began a plastic bag recycling program in 2019 through their vendor. The Bookstore posted signage to encourage patrons to bring their own bags to divert this plastic from the waste stream. Expanding this program by adding other collection points on campus would help educate our community and reduce plastic waste. To further expand on this

example, we plan to investigate plastic bag fees for other on-campus vendors, to ideally dissuade customers from using single-use bags.

#5.3 [F&S w/Provost Office] Establish a culture of reuse, with 2 major campuswide zero-waste events using durable goods and composting in FY21, 4 in FY22, 6 in FY23, and 8 in FY24.

Our first Zero Waste objective concerns the origins of the University waste stream (i.e., purchasing and procurement); our second objective ensures that the waste we do generate is disposed of using bins that are appropriately labeled and well-maintained.

Building upon these strong foundations, our third objective is designed to ensure that the items used on campus — particularly in large-scale event settings — are durable, repairable, and reusable, contributing to a University-wide culture of reuse that extends to individuals.

Zero-Waste Events

Because of their high-profile nature, University-sponsored events provide the perfect opportunity to begin cultivating a culture of reuse on campus.

While student welcome events and Grange Grove tailgates alike are charged with camaraderie and excitement, they also result in garbage bins full of disposable bottles, single-use plastics, and uneaten food scraps. It is the University's responsibility to ensure that these events — particularly those hosted by the Chancellor and Provost — are as sustainable as possible. To guide event planners toward environmentally conscious best practices, F&S will draft a "Zero-Waste Events Guide."

Catered events are especially prone to waste production. Individuals responsible for purchasing often opt for single-use utensils, plates, beverage cups, and serving implements for financial reasons or for convenience; in response, we plan to establish incentives and pricing structures to encourage using durable materials for all campus events that include food.

We also aim to address campus events that include tabling, distributing marketing materials, and hosting giveaways. A prime example is the University of Illinois Quad Day. This event is quintessential "college": the Main Quad filled with music and chatter, pathways lined with canvas tents, throngs of students eager to engage with registered student organizations (RSOs). While academic and extracurricular tabling events cultivate community, they inevitably generate waste from discarded pamphlets, fliers, packaging, and branded items with short life cycles. To reduce disposables associated with these activities and provide sustainable tabling and marketing options, we will develop a "Zero-Waste Swag Document" to be referenced by offices, departments, and RSOs.

Our initial goal is that two events observe zero-waste practices by FY21; we hope to generate momentum and encourage a more widespread adoption of these practices as time goes on. Starting small and making consistent progress will allow us to achieve gradual "footholds" and continue making progress year after year.

U of I events — from sports contests to Commencement — carry a prestigious and highly respected reputation. By introducing zero-waste practices in these contexts, we hope to lead by example and encourage adoption of similar habits by all who attend.

Excess Items

In addition to our focus on campus events, abundant opportunities exist to establish a University-wide culture of reuse in other contexts as well. Central to our zero-waste philosophy is the concept of interdepartmental collaboration: *We don't need this, but someone else might.*

In an effort to encourage reusing items as opposed to buying new, we want to ensure that unneeded but reusable items (office supplies, electronics, furniture, etc.) are made internally available to University units. To do this, we will establish an intra-campus communication system allowing departments to post, exchange, and claim items. In the event that an item cannot be reused internally, we will implement procedures to make it available to external recipients such as local nonprofits and state agencies.

All of the above will incorporate feedback from the [Surplus Warehouse](#)⁹³ housed under the Office of Business and Financial Services (OBFS) to ensure that transactions are completed through established procedures and are permitted by relevant policies.

Individual Culture of Reuse

In tandem with policy revisions to University-sponsored events and reuse of Surplus items, it is crucial to establish a culture that encourages individuals to take actionable steps. Ideally, the best practices we implement as a campus will make it easier and more intuitive for individuals to make zero-waste-conscious choices of their own.

For example: by installing refill spouts on drinking fountains in campus facilities, we hope to encourage students, faculty, and staff to carry reusable rather than single-use water bottles. The goal is to create an environment supportive of zero-waste practices on all levels.

#5.3.1 [F&S] Develop a comprehensive Zero Waste messaging campaign by FY21, and achieve a cumulative total of 10,000 “Use the Bin” pledges by FY24.

Individual behavioral change is integral to a successful zero-waste program. Therefore, we plan to launch a Zero Waste messaging campaign with the aim of ensuring that students, faculty, and staff are aware of — and enthusiastic about — playing their part.

We want everyone on campus to pursue the goal of zero waste. Hence, we wish to reach as many individuals as possible through a variety of avenues. These might include digital channels like web pages and social media (Facebook, Twitter, Instagram, etc.), competitions and contests (e.g., a challenge to create art from recyclable materials), reuse workshops, and events organized in tandem with global and national initiatives like the Earth Day Network and America Recycles Day. We can also leverage existing campus events, like Illinois sports, to incorporate zero-waste elements into high-profile gatherings (e.g., an annual “Zero Waste” football game).

93 <https://www.obfs.uillinois.edu/equipment-management/retrieving-free-surplus-equipment/>

One of the themes we wish to communicate through digital channels is the importance of recycling on the Urbana-Champaign campus. First, an improved labeling system would educate the public on the nuances of what can and can't be recycled. Additionally, many on-campus opportunities exist for waste diversion of personal items including electronics, cell phones, textiles, household goods, appliances (i.e., microwaves, fans, etc.), furniture, and other items students bring to campus-owned facilities that are often abandoned and fed into the University waste stream. Personal refrigerators, for example, can be recycled via the F&S refrigeration shop. A specific example of a recycling-focused information campaign might draw attention to one of the campus recycling facilities: the Waste Transfer Station (WTS).

First-year Student Engagement

To ensure that our message hits home with the student population, we will include information about zero waste when and where it counts: at the beginning of students' Illinois careers. For example, information about recycling on campus can be distributed to first-year students during orientation events and first-semester courses, and integrated into their daily lives and practices throughout their freshman year.

Ethics Training

In addition to student involvement, we intend that our zero waste initiatives speak directly to faculty and staff members. One project currently underway is a SWATeam recommendation to incorporate zero-waste elements into the annual ethics training program for University employees, which is approved by the Office of the Executive Inspector General (OEIG) and taken by all faculty and staff members in the University of Illinois System. This training will provide a general overview of the iCAP as well as departmental guidance on zero-waste protocol — specifically regarding recycling. In its first year (2020), it will be presented as an optional module that individuals can visit following the mandatory ethics training; in future years, it will become mandatory. While its focus is currently quite narrow, the training can be expanded in the coming years to include other topics of relevance (e.g., energy efficiency).

Campuswide Outreach

To strengthen the campus's collective approach to zero waste, we hope to integrate student involvement with that of staff and faculty members. One way to do this is through a Zero Waste Ambassadors program, in which student coordinators would collaborate with departmental contacts to increase sustainable practices, with an emphasis on waste reduction.

Dump & Run

To further strengthen the engagement of campus and its communities on waste prevention and reuse, F&S has partnered with the University YMCA to expand the Dump & Run program.

The Dump & Run program gathers furniture, kitchenware, small household appliances and electronics, school and office supplies, nearly-new clothing, books, toiletries, lawn and garden items, artwork, vinyl and CDs, musical instruments, sporting equipment, and other household goods. Collected materials find new homes and life at the annual sale during student move-in. This program reiterates the notion of a circular economy, whereby materials continue to be used through their useful life before entering the waste stream.

#5.4 [F&S] Promote food scraps reduction on campus through a behavior change campaign and tracking and recovery of surplus food for donation, with at least five new areas tracking and reporting their food waste by FY22.

Food scraps comprise a significant portion of the total landfilled waste at the University of Illinois. But just how much food is thrown out on campus in a given week, semester, or year?

In 2014, a Baseline Waste Stream Characterization Study⁹⁴ prepared by the Illinois Sustainable Technology Center (ISTC) revealed that organic and compostable materials (including food scraps) ranked consistently as the first- and second-highest waste categories in the buildings examined. The report detailed waste production in the Alice Campbell Alumni Center, Henry Administration Building, Swanlund Administration Building, and Illini Union Bookstore, and found that “food scraps, food soiled paper, paper towels, and other compostable items constituted a significant portion of the waste from these buildings. For these four buildings alone, the organics segment accounts for 17.2 tons annually.”

University Housing is the only unit on campus independently tracking how food scraps factor into waste production; its efforts have been effective and well-received, and exemplify the impact that metrics can have on waste reduction. Housing uses a program called Leanpath⁹⁵ to track all pre- and post-consumer food waste in University dining units. By using the cloud-based software to digitally weigh food waste and target “problem areas,” campus dining halls have dramatically reduced their pre-consumer food waste (e.g., surplus food, spoiled ingredients, or scraps resulting from food preparation). Housing also uses an extension of this program, Leanpath Spark, to measure post-consumer waste (e.g., leftovers) and use the results to educate customers on how they can make a positive impact.

Many facilities responsible for food production and distribution do not have such tracking systems in place. As with many of the objectives outlined in this plan, a preliminary step to ensure informed decision-making involves accruing the appropriate data. To this effect, we will begin tracking food waste (by weight) from self-operated campus food services that do not already do so (e.g., University Catering Services, Bevier Café, campus coffee shops, and in-institute cafés like Beckman Café, Array Café in IGB, and Latté Da! Café in Lincoln Hall).

Units with contracted food services (e.g., Athletics and the Illini Union) are expected to include stipulations for tracking food waste in new or renewed contracts. These stipulations may require modification to conform to grab-and-go dining (e.g., Memorial Stadium concessions).

In addition to introducing waste-tracking policies to self-operated and contracted food distributors, we hope to impart a consciousness of food waste on campus consumers: the students, faculty, staff, and visitors who take advantage of these services daily. We plan to launch a creative, informative campaign to spread awareness of the issues surrounding food waste. The three-pronged campaign will: 1) offer relevant statistics about food waste, both on campus and globally; 2) provide actionable next steps by encouraging activities like zero-waste lunches; and 3) drive participants to make a difference by directing them to a food donation

94 https://icap.sustainability.illinois.edu/files/project/1300/Baseline_Waste_Stream_Characterization_Study_Final_Report.pdf

95 <https://www.leanpath.com/>

webpage. When people stop for their morning coffee, to-go lunch, or late-night study snack, we hope that they do so thoughtfully and with consideration of their environmental impact.

By FY24, we anticipate a reduction of 30% of food scraps in the areas that start tracking food waste. Once the program is running in numerous on-campus locations, we can partner with local businesses to encourage tracking, and subsequent prevention, of food waste.

#5.5 [F&S] Develop a detailed comprehensive plan including implementation and operational costs/benefits to sustainably dispose of all food scraps and other organics by FY24, and fully implement the plan by FY33.

The previous objective addresses our data-backed approach for minimizing campus food waste. Unfortunately, the existence of excess food on plates, at events, or in dining halls is inevitable — there will always be leftovers, scraps, and uneaten meals that cannot be redistributed. Our goal, then, is to ensure that none of this waste reaches the landfill.

In the “reduce, reuse, and recycle” frame of mind, we want to exercise every available opportunity to productively, sustainably, and completely dispose of campus food waste. Below are several methods for “reusing” and “recycling” food waste that we plan to explore and implement in the coming years.

Composting

We don’t just want to sustainably dispose of our food scraps — we want to put them to work! In conjunction with other iCAP objectives supporting efforts to compost on departmental or individual scales, we hope to integrate food waste into a campus- and community-wide composting initiative.

In 2010, a feasibility study evaluated the viability of large-scale composting on campus.⁹⁶ In the coming years, we intend to conduct an up-to-date cost-benefit analysis. In addition to financial and logistical considerations, this analysis can examine how local farmers stand to benefit from buying compost from the University, as well as any legal limitations governing these interactions.

Following this analysis, we will proceed with the most reasonable plan. The options for composting are diverse, and may include: increasing the number of small-scale composting solutions around campus (e.g., the composting tumbler in NSRC, as discussed in the Land & Water chapter); engaging surrounding communities in composting endeavors; and investigating opportunities to establish commercial composting facilities for campus and surrounding communities.

Composting is a particularly apt example of the interdisciplinary and integrated approach that we hope to take with the entirety of iCAP 2020. Moving forward, it’s incredibly important to consider the many ways in which our seven themes interact with, affect, and enrich one another.

⁹⁶ <https://icap.sustainability.illinois.edu/project/large-scale-food-waste-composting>

Resource Recovery/Anaerobic Digester

Composting isn't the only way to divert food scraps from the landfill; we are also exploring technologies that are capable of recovering resources from University-generated food scraps (e.g., using an anaerobic digester). This process could be carried out on site at a future Dairy Facility, or with community partners such as the Urbana-Champaign Sanitary District (UCSD).

Recycling

While you might not associate food waste with traditional "recycling," many options exist for repurposing common ingredients for alternative functions. For example, we are exploring a way to recycle all used cooking oil (i.e., vegetable or olive oil) for a beneficial use such as biodiesel: a high-quality, high-functioning fuel derived entirely from renewable resources. Campus researchers received Living Lab seed-funding and Student Sustainability Committee funds to study the potential to convert biowaste into bioenergy and reduce pollution. Research focuses on testing processing systems to deliver renewable energy, clean water, and organic fertilizers for agriculture.

#5.6 Increase the use of local food to 35% by FY30.

University Dining is committed to purchasing as much food as possible from local vendors to support small farmers and conserve energy associated with long-distance transportation. As of FY15, the University had committed to surpassing statewide procurement standards in this area, and was already sourcing one quarter of dining hall food expenditures from such locations.⁹⁷

In order to further increase the University's use of local food, we must:

1. Define what precisely is meant by the term "local" and enforce appropriate standards;
2. Identify the most efficient produce items to locally source based on factors like growing season; and
3. Measure total energy expended as a result of local purchasing as compared with long-distance transportation, and make decisions based on the resulting data.

Speaking to the first of these considerations, the Illinois "Local Food, Farms, and Jobs Act,"⁹⁸ which calls for State agencies and facilities to locally purchase 20% of farm and food products by 2020, defines "local farm or food products" as "products: (1) grown in Illinois; or (2) processed and packaged in Illinois, using at least one ingredient grown in Illinois." Moving forward, we should have a student work with campus stakeholders to establish a shared and flexible definition for "local food."

#5.6.1 [Housing] Implement Food Literacy Project by FY24 by tracking carbon, nitrogen, and water footprints for food items in campus dining halls.

⁹⁷ <https://icap.sustainability.illinois.edu/project-update/uiuc-recognized-use-local-foods>

⁹⁸ <http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=3137&ChapterID=7>

Sustainable diets tend to be less resource-intensive and have lower energy and water inputs. The University can help promote environmentally-conscious diets that are beneficial to campus and the environment. Local food has the potential to decrease the carbon emissions associated with food transportation and promotes the local economy by supporting small farmers and businesses.

The Food Literacy Project is a tagging mechanism to show which foods in the dining halls come from local sources, and their carbon, nitrogen, and water footprints. This will help promote intentional decision-making to choose foods that are more sustainable and are from local sources. Implementing this project will integrate opportunities on the Student Sustainable Farm and meal suggestions for “green” diets. Ultimately, a more intimate connection with food sources can increase awareness about food choices in the dining halls and beyond.

#5.7 [F&S] Establish a green cleaning program that meets LEED v.4 requirements by FY24.

Facilities and Services (F&S) staff members consistently ensure that campus operations are performed with minimal exposure of F&S personnel and building occupants to hazards that adversely affect human health, air quality, building finishes and systems, and the environment. One way to reduce such exposure is through procurement and use of green cleaning products and processes. These might include simple steps (e.g., placing floor mats at entrances to prevent dirt from entering the building), or more in-depth solutions (e.g., transitioning a portion of cleaning chemicals to third-party green certified products).

Conclusion

As individual consumers and as members of the Illinois community, we have the ability to divert the campus waste stream at many points along its path. From the initial procurement of a good or service to its eventual reuse or disposal, there exist countless opportunities to intercede with environmentally conscious decision-making.

That said, pursuing a University-wide culture of zero waste requires an investment of resources and time from individuals, units, and University governing bodies. Ensuring that our targets are met with urgency and intentionality requires a dedicated effort at all levels, whether that takes the form of the campus reducing food waste, a unit reusing furniture found in Surplus, or students recycling their minifridges because they received instructions detailing how to do so.

With the strategies outlined in this chapter, we hope to encourage a behavior-change campaign to educate, empower, and promote environmental stewardship among our students, faculty, and staff. However, the University must be prepared to honor and support campus and community efforts in this area. It is therefore necessary to obtain adequate, reliable funding to sustain projects, ensure long-term adoption of our strategies, and secure successful completion of the above objectives.

Our institution has more than 50,000 students, 11,000 faculty and staff, five residence dining halls, and seven retail operations serving over 20,000 customers per day during the academic year. The impact of tracking, analyzing, and reducing our waste stream therefore extends well beyond the bounds of campus.

DRAFT

Chapter 6: Education

Introduction

In higher education, the multidisciplinary principles and skills of sustainability should permeate the curriculum. All relevant subject fields — from engineering to behavioral sciences, economics to the fine arts — should be brought into the 21st century through synthesis with environmental topics. These efforts are expected to enhance the students' engagement in iCAP activities.

In 2020, it is particularly crucial that the dialogue surrounding environmental sustainability become as interdisciplinary as possible. Now more than ever, government, industry, and advocacy organizations are looking to a rising generation of environmental leaders from diverse fields. Graduates with a worldview that combines a technical knowledge base with social understanding of local and global sustainability concepts will be in high demand.

With 250 undergraduate and graduate programs distributed throughout 16 major academic units, the University of Illinois has the opportunity to instill a culture of sustainability into students of all disciplines. No matter their disciplinary paths, we hope to empower our students to engage in addressing today's most critical development and environmental issues.

Following graduation, former Illinois students strike out to make a difference across the globe — in-state and out-of-state, from Fortune 500 firms to small nonprofits. According to the 2018-19 Illini Success Report, 93% of Illinois 2019 graduates secured a “first destination” (i.e., a volunteering position, internship, or job).⁹⁹ An Illinois education should empower students of all professional trajectories to be recognized environmental leaders in a diversity of contexts among their colleagues, peers, and friends.

Newly formed in 2019, the Education SWATeam is tasked with suggesting opportunities for all Illinois students to engage with sustainability, energy, and environmental education offerings and co-curricular opportunities during their time on campus. This team was preceded by the Sustainability Education Task Force. In 2010, this Illinois faculty coalition developed Sustainability Outcomes for Illinois graduates in the three themes of “Sustainability in Day-to-Day Life,” “Sustainability Knowledge and Skills,” and “Sustainability as a Personal Vision.” These Outcomes are:

Sustainability in Day-to-Day Life

1. Students will learn ways in which natural resources are used to produce what they consume, such as the food they eat, the water they drink, and the energy they use.

⁹⁹ <https://news.illinois.edu/view/6367/806931>

2. Students will understand ways in which their lifestyle and well-being are interconnected with those of diverse producers and consumers around the world, including impoverished communities.

Sustainability Knowledge and Skills

1. Students will learn core concepts of ecology and develop skills relevant to their chosen field to provide a basis for environmental sustainability.
2. Students will learn to think holistically about sustainability using perspectives across multiple disciplines.

Sustainability as a Personal Vision

1. Students will understand relationships between global environmental and economic trends and their impact on diverse cultures and communities.
2. Students will develop an integrated vision for sustainability that embraces their personal lives, professions, local communities, and the world-at-large.

Ten years later, our overarching goal for iCAP 2020 is for curricular and co-curricular sustainability learning to permeate day-to-day student life and the overall undergraduate education experience at the University of Illinois. Furthermore, our broad iCAP aim is that graduates take these sustainability lessons with them into every aspect of their professional and personal lives — to make those principles a part of their lifelong identity.

Currently, the University of Illinois has a significant array of sustainability-related educational course offerings and programs hosted by a range of colleges. Three sets of highlights are noted below.

iSEE's curricular education programming has grown from 2015 to 2019:

- [The Sustainability, Energy, and Environment Fellows Program](https://sustainability.illinois.edu/education/sustainability-minor/)¹⁰⁰ (SEE FP) has 56 students enrolled as of Spring 2020. This curricular minor originated in response to an objective in the “Curricular Education” chapter of the 2015 iCAP, which called for transitioning an existing Environmental Fellows program to be housed under iSEE. Students can apply to become a Fellow; the program requires completion of 16-18 credits in pre-approved courses. In Fall 2019, iSEE hired a full-time Academic Instructor/Advisor to facilitate growth of the SEE FP and cultivate strong student cohorts of diverse academic backgrounds.

¹⁰⁰ <https://sustainability.illinois.edu/education/sustainability-minor/>

- An iSEE [database](#)¹⁰¹ of sustainability-related courses offered on the Urbana-Champaign campus. The database is refreshed prior to registration each semester and identifies courses that meet the SEE FP program requirements as well as hundreds of others that incorporate sustainability.
- The [Certificate in Environmental Writing \(CEW\)](#)¹⁰² launched in Fall 2017 marks an innovative collaboration between iSEE, the School for Earth, Society, and Environment (SESE), and the English Department. The CEW builds students' skills in written and multimedia environmental communication, with the value-added goal of publishing their best work in a dedicated journal, [Q Magazine](#),¹⁰³ which debuted online in Fall 2018 and in print in Summer 2019. (Generous funding from donor Janelle Joseph allows students to regularly travel to research on-location articles for *Q Magazine*. As of Spring 2020, we are pleased to announce that this funding will continue into its second and third years.)

Per the objectives outlined in iCAP 2020, iSEE aims to expand and diversify these curricular offerings, mandate sustainability education during freshman orientation and through a General Education requirement, and offer more co-curricular and pre-professional opportunities for students in sustainability fields.

The College of Fine and Applied Arts (FAA) recently launched a B.S. in Sustainable Design.¹⁰⁴ The program incorporates design thinking strategies and “offers an innovative, interdisciplinary course of study in design, with a focus on building sustainable communities through the intentional design of environmentally sensitive products, buildings, neighborhoods, landscapes and cities.” The College of Liberal Arts & Sciences also houses a major in Earth, Society, and Environmental Sustainability (ESES) where students learn about the relationship between the environment, economic, and social systems, the impacts of our actions, and solutions to ensure sustainable societies in the future..

2020-21 school year marks the second cycle of [the Levenick iSEE Teaching Sustainability Fellows Cohort](#).¹⁰⁵ This curriculum development fellowship allows Illinois faculty and instructors from all disciplines to apply for funding to either augment an existing course with sustainability content or fashion a new course with a sustainability focus. The result is increased offerings of creative, practical courses that integrate sustainability into a variety of disciplines and encourage students and faculty alike to explore environmental topics from new angles.

Of particular importance to our educational programming objectives is integrating sustainability concepts into science, technology, engineering, and mathematics (STEM) curricula. Students in STEM programs often lose sight of the relationship between technical knowledge systems and the societal, political, and economic aspects of sustainable decision-making. Creating paths for

101 https://sustainability.illinois.edu/wp-content/uploads/2019/11/List_of_Sustainability_Courses_Spring_20201.xlsx

102 <https://sustainability.illinois.edu/education/cew/>

103 <https://q.sustainability.illinois.edu/>

104 <http://catalog.illinois.edu/undergraduate/faa/sustainable-design-bs/>

105 <https://sustainability.illinois.edu/education/teaching/fellows/>

cross-seeding of thought between STEM and sustainability will not only benefit students, but will also encourage faculty to continue their own intellectual and professional development in interdisciplinary sustainability. We also aim to incorporate campus sustainability projects into an increased number of courses (which has been done for several courses already) and provide instructors and students with living examples for case studies on sustainability (e.g., student term projects).

iSEE's Living Lab Program is designed to encourage interdisciplinary sustainability research across campus and to link campus sustainability goals to broader environmental challenges. Examples of Living Lab research includes studying traffic to reduce vehicle idling time, integrating groundwater resources and geothermal energy for water and energy security and resilience, and wind turbine integration for electricity generation. Students also have the opportunity to participate in the Sustainability Living-Learning Community. University Housing offers eleven LLCs around a specific theme by providing in-hall courses and hands-on programs. Students in the Sustainability LLC come together to live and learn about the diverse topics that stem from sustainability, environmentally-conscious living.

Campuswide, iCAP projects have been used in existing courses as living examples and topics for students' term projects. These efforts will be continued and expanded. We hope to extend our efforts to integrate sustainability into all aspects of students' educational journeys — not simply those that take place in a classroom. Each milestone along the way to commencement, from the first freshman orientation event to a senior year capstone course — is instrumental in shaping a student's identity, be it as a learner, pre-professional, or well-informed citizen. At each of these stages, we hope to meet students exactly where they are, equipping them with the principles and practical skills to act as responsible environmental stewards in their professional and personal lives.

At Illinois, we are educating the critical decision-makers of tomorrow. Our goal is to make sustainable decision-making instinctive, well-informed, and practical for all students, whatever their future path.

Education Objectives

The following Education objectives were developed by the SWATeams, iCAP Working Group, campus community, and Sustainability Council to guide the University's actions in compiling a robust portfolio of pragmatic sustainability education programs.

- 6.1 Broaden Sustainability Education**
- 6.2 Sustainability Course Catalog**
- 6.3 Environmental Leadership Program**
- 6.4 Sustainability Internship Program**
- 6.5 Sustainability at Career Fairs**
- 6.6 Graduate Certificate in Sustainability**

#6.1 [iSEE] Broaden the availability of sustainability education across the entire curriculum, beginning with freshmen orientation and continuing through commencement, with at least one of four proposed methods implemented by FY24.

When first-year and transfer students begin their careers at the University of Illinois, they are introduced to a range of concepts that guide their approach to college life, including how to think critically, where the MTD bus stops are located, and why action verbs make for effective resumes. These knowledge areas, which are both practical and useful for incoming students, should be augmented with an equally valuable sustainability toolkit.

To broaden sustainability education across campus, we must identify mechanisms to provide all students with information about incorporating sustainability into their fields of study and future careers. At least one of the following four proposed methods is to be implemented by FY24:

1) *Freshman Sustainability Seminar*

To introduce sustainability as early as possible, we aim to develop a required educational program for all incoming students. This program would introduce campus sustainability programs and iCAP programs and practices, and could be implemented in collaboration with individual colleges and units as part of freshmen orientation seminars. Each semester, we will report the total number of student participants in this program.

First-year student engagement is also a strategy outlined in the Zero Waste chapter (see #5.3.1) to effectively communicate campus recycling behavior.

2) *Sustainability General Education Credit*

In order to implement a sustainability general education (GenEd) requirement, we must first identify the appropriate department with whom to collaborate (i.e., General Education Board within the Office of the Provost). The Committee for Environmental Sustainability within Illinois Student Government (ISG) has started investigating the prospect of including a Sustainability GenEd credit for all U of I students.

3) *100-level Courses*

Several colleges currently offer 100-level courses designed to onboard students and ease the transition into college life. By FY24, we aim to integrate a sustainability unit into each of these courses. We will pilot this program through, as an example, Grainger College of Engineering and the College of Liberal Arts and Sciences (LAS). Each chosen 100-level course would include a sustainability-focused lesson designed to expose students to the iCAP goals as well as practical applications of sustainability learning. For example: how can students, as members of campus and of society, apply sustainable practices into their education and daily lives?

Because a student studying civil and environmental engineering might encounter sustainability differently than an individual pursuing music performance, colleges and

departments would be allowed flexibility to tailor course content to their respective disciplines. Junior and senior students tasked with teaching these courses would receive appropriate training.

4) *Sustainability Workshop*

Creating a Sustainability Workshop with a catchy acronym (similar to existing programs FYCARE and ACE IT) would be beneficial because the instructors for such a workshop would likely be campus staff and faculty who are passionate about sustainability efforts.

This workshop, potentially named EARTH (Environmental Action Right This Hour), would be a one- or two-hour-long course focusing on campus sustainability and opportunities for student involvement.

#6.2 [iSEE] Establish a comprehensive online repository for courses and academic programs with sustainability content.

A comprehensive listing of sustainability courses and academic programs needs to be made easily accessible to students across campus. This includes majors, minors, certificates, and assorted sustainability-focused opportunities in various departments (e.g., the iSEE sustainability minor and undergraduate Certificate in Environmental Writing (CEW), IB ecology minor, courses in NRES, ACES, LAS, ESE, etc.). An improved filtered search option available in the University course catalog would centralize resources and opportunities for students interested in these sustainability offerings for academic credit and would increase visibility of such programs during registration periods.

This repository, which may be developed as part of the iSEE website, could also include a link to the iCAP Portal; this database is conducive to data and project updates — which would further expand the connectivity of digital sustainability resources.

#6.3 [iSEE] Launch an undergraduate Environmental Leadership Program (ELP) that includes two week-long residential intensives, pre-professional workshops, visiting speakers, and field trips to Springfield and Washington, D.C.

While we strive to integrate sustainability themes into curricular courses, we also hope to create opportunities for students to engage with energy and the environment outside the classroom. An example of this is launching an Environmental Leadership Program (ELP). The ELP will be open to undergraduate students and will take the form of two week-long immersive training conducted in partnership with the University YMCA.

#6.5 [iSEE] Develop a sustainability internship program by partnering with businesses, nonprofits, local governments, and cultural institutions in Central Illinois. The total number of internships awarded will be reported each year.

In addition to the shorter-term Environmental Leadership Program (ELP), we plan to offer a longer-term internship opportunity wherein students can gain experience incorporating sustainability into the professional sphere.

Illinois students are consistently committed to high levels of achievement both in and out of the classroom. According to the 2018-19 Illini Success Report, “90 percent of students reported participating in an experiential learning opportunity (internship, research project, study abroad, service learning, clinical programs, etc.).”

With this in mind, providing opportunities for sustainability-focused experiential learning is an excellent way to incorporate sustainability into students’ holistic education while maintaining the University’s mission. It is therefore imperative to increase co-curricular program offerings in sustainability for students seeking professional development, leadership training, and sustainability education outside their discipline.

Collaborating with local entities to achieve this objective will provide networking opportunities and connections for U of I students with other sustainable institutions and organizations in the area.

#6.6 [Career Center w/iSEE] Incorporate sustainability opportunities for at least three career fairs per year beginning in FY21.

As students search for internship and employment opportunities beyond the University, we would like to encourage them to factor organizations’ sustainability commitments into their decisions.

Career fairs are essential to student exploration of opportunities for internships, jobs, and professional development both on campus and off. We propose to pilot a sustainability component in existing campus career fairs. Participating companies may opt to have an “Eco-Friendly” tag on their booth to serve as a sustainability designation.

Following the initial rollout of this method, a survey will be distributed to student attendees to solicit feedback on questions such as: Did the “Eco-Friendly” tags influence your decision-making? Are you more likely to pursue opportunities with companies who self-identify as sustainably-oriented?

#6.7 [iSEE] Offer a new graduate certificate in sustainability by FY24.

The University of Illinois at Urbana-Champaign is proud to educate more than [16,000 graduate students](#).¹⁰⁶ While many do not work directly in sustainability-related fields, they nevertheless care deeply about environmental issues and wish to incorporate sustainability awareness into their research, classrooms, and workplaces.

To offer an opportunity to integrate sustainability themes into diverse graduate fields of study, iSEE plans to coordinate a graduate certificate in sustainability. Students will commit to a core

¹⁰⁶ <https://grad.illinois.edu>

course requirement, after which they can pursue one of multiple tracks (e.g., infrastructure and planning, business applications of sustainability, human dimensions, policy, etc.). The implementation of a new graduate certificate in sustainability can be leveraged with external funding support, such as the graduate traineeship program (NRT) at the National Science Foundation.

Conclusion

The educational component of our University's Climate Action Plan was foundational to the Climate Commitment first signed in 2008. This commitment reads:

Campuses that address the climate challenge by reducing global warming emissions and by integrating sustainability into their curriculum will better serve their students and meet their social mandate to help create a thriving, ethical and civil society. These colleges and universities will be providing students with the knowledge and skills needed to address the critical, systemic challenges faced by the world in this new century and enable them to benefit from the economic opportunities that will arise as a result of solutions they develop.¹⁰⁷

As we pursue climate-consciousness, carbon neutrality, and resilience over the next 30 years, this sentiment remains integral to our success. We are fortunate to have a passionate student body who have consistently and increasingly proven their commitment to promoting environmental stewardship and learning about sustainability. It is our responsibility to develop and educate these students in sustainability principles — and to impress upon tomorrow's cohort of leaders that their aspirations are not only supported, but achievable.

Our students have diverse identities, and therefore diverse paths. They are researchers, young professionals, mentors, artists, athletes, educators, scientists, and storytellers. The multidisciplinary curricular and co-curricular programming envisioned in this chapter is designed to empower current and future Illinois students to make a difference wherever they find themselves post-graduation.

With the sustainability imperative as relevant to incoming freshmen as to final-semester seniors, we believe that a sustainable future for our Illinois graduates begins in classrooms all across our campus, and should likewise permeate every aspect of the student experience at Illinois.

¹⁰⁷ https://sustainability.illinois.edu/wp-content/uploads/2016/12/Climate_Commitment.pdf

Chapter 7: Engagement

Introduction

While not linked to an officially charged SWATeam, outreach efforts spanning each of our iCAP themes are instrumental in establishing a strong campus sustainability culture. Even the most concerted efforts to design and implement environmental policy fail to gain traction when not thoroughly embraced by the community at all levels — from students, faculty, and staff to local governing bodies and stakeholders.

Our approach to outreach is two-pronged, providing: 1) clear, palatable information; and 2) outlets for stakeholders to engage with and respond to that information. The iCAP Portal was established in 2012 to disseminate clear and transparent information regarding progress toward the iCAP objectives. The iCAP Working Group (iWG) is a key group that brings campus groups together to collaborate in order to engage the campus community. The members of this group are instrumental in providing feedback, suggestions, and outreach to their affiliated organizations and departments.

iSEE also facilitates numerous outreach programs and events designed to foster public engagement. For the past six years, iSEE has hosted an annual Congress event in collaboration with other campus departments. The public conference is an assembly of leading national and international scientists, researchers, educators, and activists who present the latest scientific research and community action on grand world challenges of sustainability, energy generation and conservation, and the environment. Most recently, Congress 2019, titled “Sustainability Justice,” focused on bringing light to issues of environmental activism.

In addition to events hosted by iSEE, the Institute maintains a consistent tabling presence at events of campuswide interest, including Quad Day in the fall semester, Environmental Quad Day in the spring semester, the All-Employee Expo, and the Humanities Expo hosted by the College of Liberal Arts and Sciences for the first time in Fall 2019.

iSEE prides itself on fostering interdisciplinary research that involves academic departments across campus; the same is true for sustainability programs. In Spring 2020, iSEE published the latest version of its Certified Green Office Program (CGOP), in which offices and units can pick a sustainability ambassador, enroll, take simple steps to reduce resource use and emissions, and earn a certificate for their efforts. Similar certification programs for campus laboratories, Registered Student Organizations (RSOs), and Greek life are also underway. iSEE has also launched a seed funding program “Using Campus as Living Labs” to engage researchers on iCAP objectives by using iCAP project sites as research testbeds.

Our primary goal is to cultivate the former, and build awareness of the stakes, statistics, and strategies we plan to develop over the next five years. As noted in the Introduction chapter, campus and community involvement was particularly prioritized in this iteration of the Illinois

Climate Action Plan; however, to increase visibility of the iCAP at Illinois, we must integrate sustainability programming within all departments and units — not just those specifically tied to the drafting process. Rather than merely a series of mandates and policy requirements, environmental policy on campus should transition into a *movement*, to be widely embraced, encouraged, and celebrated.

Equally important to engaging more folks is the need to communicate more frequently. In the past, iCAP messaging has been significantly more concentrated in the months immediately surrounding publication — that is to say, a short surge every five years followed by a period of silence. Moving forward, we will increase our communications efforts annually, and even monthly, reiterating the presence of the iCAP continuously and reminding our students and staff that progress toward our objectives is ongoing.

Engagement Objectives

The following Engagement objectives were developed by the SWATeams, iCAP Working Group, campus community, and Sustainability Council to guide the University's actions toward expanding outreach efforts and strengthening the culture of sustainability on our campus.

- 7.1 Green Certifications**
- 7.2 Sustainable Events Program**
- 7.3 Green Sports Alliance**
- 7.4 Local Collaborations**
- 7.5 Support Youth Sustainability**
- 7.6 iCAP Portal Updates**

#7.1 [iSEE] Enhance the overall culture of sustainability on campus, and increase the number of certifications issued through the Certified Greener Campus Program by 20% each year from FY20 to FY24.

In keeping with our overarching iCAP goals, we have placed unparalleled importance on cultivating a lasting culture of sustainability incorporating students, faculty, and staff.

To date, some of the biggest proponents of a sustainability culture at the University of Illinois are the many student groups and RSOs focused on environmental topics. Since the 1969 founding of SECS, or Students for Environmental Concerns (then called Students for Environmental Controls), passionate students have remained our institution's proud environmental pulse.

Moving forward, we want to expand our impressive array of sustainability-affiliated student groups. Rather than increasing the number of RSOs, we will bolster existing events, sustainability initiatives, and recruitment efforts through lending our voices, resources, and time in support of students. We will also work with student groups to facilitate opportunities for

networking and collaboration, as our students' greatest asset has always been their ability to support one another.

The culture of sustainability on campus is not a particularly “measurable” objective — however, one way to track our progress among academic offices is through iSEE’s Certified Green Office Program (CGOP). As stated in the introduction, the CGOP is a guided program for campus units to implement long-term sustainability solutions; by managing the process from start to finish, participating faculty and staff receive an active education in best practices for maintaining a green office. We aim to expand the Certified Greener Campus Program by including certification options for Green RSOs and Green Greek Chapters.

The most recent version of the CGOP was launched in Spring 2020; the next step is communicating this opportunity to units across campus. We plan to increase awareness of this program among Illinois staff and faculty through branded videos, digital signage, and other marketing materials. As part of our initiative to link all current and future campus sustainability efforts to iCAP objectives, this messaging will also include monthly progress reports with specific emphasis placed on strategies implemented through the CGOP.

Many offices on campus have already committed to pursuing certification in this program, and we are proud of their efforts to not only implement solutions, but to spread the word about the CGOP to peers and colleagues. We want to shine a light on the projects, progress, and contributions that individual departments are making as a result of their certification.

#7.2 [Illini Union] Develop a Sustainable Events Program by FY23, with 100% of the Illini Union Board events qualifying in FY24.

For this objective, we will partner with the Department of Recreation, Sports & Tourism (RST) to develop and incorporate sustainable practices into a module of that department’s Event Planning course. RST undergraduate and graduate students can work as event consultants for Illini Union Board events.

#7.3 [DIA] Increase visibility of campus sustainability efforts by joining the Green Sports Alliance through the Division of Intercollegiate Athletics (DIA) by summer 2021.

An important step to reduce the University’s environmental footprint involves the Division of Intercollegiate Athletics (DIA). The Urbana-Champaign campus is home to 11 major athletic complexes which seat up to 84,000 spectators. By joining the Green Sports Alliance, the U of I would take part in a network of sports organizations to share resources, experiences, and best practices to ensure success. The Alliance focuses primarily on seven program initiatives: energy, food, procurement, transportation, venues, waste, and water. Joining the Alliance would help promote a sustainable and eco-friendly environment for our teams, venues, athletes, and fans.

Outside of graduation and student welcoming ceremonies, athletics represent the largest on-campus gatherings each year. Thus, they represent many of our greatest opportunities to reach the most people at once with a message of sustainability. In keeping with the U of I's already recognized national position as a sustainability leader among land-grant universities, merging

our environmental efforts with our strong culture of athletics is the right thing to do. Joining the Green Sports Alliance reflects a commitment to sustainability by increasing awareness of environmental initiatives to encourage positive behaviors on our campus and beyond. Through our campus athletics, we have great potential to reduce waste, water, and energy consumption, and promote natural resource management to enact lasting change.

#7.4 [iSEE] Incorporate sustainability-related problem solving in the GivePulse system for public engagement, and track local collaborations for sustainable solutions. Increase local collaborations by 10% per year from FY22 to FY24.

A recurring theme in our Engagement objectives is the need for outreach that equips as well as informs. We strive for each of our outreach efforts to be paired with resource-backed infrastructure, so that they can eventually transition to becoming independently and sustainably managed. Local collaborations, which rely on cooperation from individuals both involved with and outside of the University, are a perfect example of this.

When considering opportunities for local collaborations, we want to start by empowering University members to think critically and creatively about local sustainability issues. Fortunately, we have an extensive depth and breadth of knowledge here on campus from which to draw. We will identify faculty members who either possess a working knowledge of local community resources, or are currently conducting community-based participatory research. In addition to faculty, we aim to introduce co-curricular sustainability partnerships between University students and local community groups, with an emphasis on developing problem-solving skills and design strategies. These tools are certainly valuable in a number of situations and are already integrated into undergraduate curricula — we believe that pairing theoretical training with practical, real-world experience strikes the optimal balance for productive collaboration.

The second component to successful local collaborations is exploring the need for resources and logistical support. For example, an opportunity for collaboration might be overcoming barriers to community food-waste composting in Urbana. Requirements for such a project might include research to fully understand EPA rules and regulations for implementing such a program; organizing community forums to gather feedback and gauge public interest; running workshops to provide training and education; obtaining sufficient funding and equipment to see the project through; and amassing the entrepreneurial experience to build momentum for the program. With this objective, we hope to break the mindset of, “we don’t have this resource in our community, so it cannot be done.” Whether the result is a sustainable landscaping solution, a green infrastructure installation, or a public awareness campaign, we want to help make any number of local collaborations possible.

As stated in the objective itself, the key metric we will measure as a result of these strategies is the total number of local collaborative projects. We will track our progress toward this objective through [GivePulse](https://www.givepulse.com/)¹⁰⁸, an online platform to “list, find, organize, and measure the impact of service and volunteerism in the community.” Through GivePulse, we will be able to obtain key information regarding who is volunteering, what projects are underway, and whether each project is successful. In addition to functioning as a database, GivePulse can also match individuals to volunteering opportunities — and organizations to interested volunteers — providing many opportunities to scale up our impact.

¹⁰⁸ <https://www.givepulse.com/about>

#7.5 [Extension] Support programs to develop love of nature and sustainability among children, with an annual Youth Sustainability Summit led by local teenagers with guidance and mentoring from campus and community sustainability leaders.

In our efforts to reach local community members, we must remain vigilant to the crucial role that children, teenagers, and young adults play in shaping our society, particularly with regard to sustainability and environmental issues.

Essentially, this objective centers around providing local youth with a sustainability “compass.” But embedded within our strategies is another key opportunity: the ability to encourage positive peer mentoring and collaboration between students of all ages — from first grade to 12th. The City of Urbana Sustainability Advisory Commission currently leads an effort to host an annual Youth Sustainability Summit. Led by local teenagers under the guidance of campus and community sustainability experts, the Summit provides a unique opportunity for students in different academic stages to put on their sustainability leadership hats and think critically about relevant environmental issues.

In addition to independently organized programs, we would like to lean on the many opportunities to foster connection between local students and U of I scholars. Our student body is committed to learning as well as leadership — during their time on campus, many undergrad and graduate students participate in programs that involve imparting academic wisdom or life skills onto younger generations. Previously, groups such as Illini Mentoring, Eat4Health, and the Sustainability Living Learning Community visited local schools to present on sustainability-related topics. We want to encourage more programs of a similar nature, and continue to provide opportunities for our students to serve as role models and peer educators in the community.

Educational opportunities taking place outside of the classroom are our third key component to achieving this objective. More so than simply providing local youth with static information, we will offer rich and interactive educational experiences: for example, a “Composting 101” event, or an interactive workshop on reusing glass bottles as planters. We will support these programs through crafting dedicated marketing campaigns, incentivizing widespread participation, and gathering detailed information to measure success and areas for improvement.

It’s been said many times that “children are the future”; speaking of sustainability specifically, this is very much the case. Ultimately, we hope to propel children toward environmental stewardship organically, by instilling within them lifelong sustainability values: passion for nature and the environment, consciousness of individual action, and the tools to internalize and communicate what they’ve learned.

#7.6 [iSEE and F&S] Update the iCAP Portal on a monthly basis to report progress toward iCAP objectives.

All of our engagement efforts thus far — whether they target students, faculty, or staff, are orchestrated in service of iCAP objectives. Our efforts are multi-faceted and span virtually all aspects of campus, but they are all unified in their connection to the University’s overarching Climate Commitment.

As we continue engaging campus personnel in our sustainability efforts, we want to make sure that we are constantly reminding our Illinois community of the large-scale implications of our actions: why their actions matter in the grand scheme of the University. This strategy will take the form of a regularly scheduled update on our progress toward the iCAP objectives — perhaps in the form of a newsletter distributed by the Office of the Chancellor. Each iteration of the newsletter might focus on a different aspect of campus sustainability, taking care to directly tie on-campus action (especially those actions recognizable by the recipients of the newsletter) to measurable iCAP metrics.

Conclusion

As is the case with environmental issues at large, we are truly all in this together. The mandates included in this action plan pertain specifically to the Urbana campus, but our efforts to provide informative and engaging outreach should extend to the community as well.

Leaning on and collaborating with local interest groups — through youth engagement, hosted programs, and research opportunities — is invaluable to ensuring our programs' lasting success. In addition to outreach efforts specific to the iCAP, we hope that our programs will help cultivate an intergenerational appreciation for sustainability, energy, and the environment within the community.

The sustainability conversation is not one way, nor do we intend it to be. Our efforts to inform must be paired with efforts to engage, empower, and most importantly encourage input and constructive feedback. The result will be a campus and community well-equipped with strength, durability, and resolve to continue pushing for progress in the years to come.

Chapter 8: Resilience

Introduction

As we brace for what is fast becoming a climate emergency, it is critical to augment existing mitigation strategies with innovative resilience measures. These include adaptive actions to strengthen our campus and community in the face of severe weather, extreme temperatures, and other potentially catastrophic fallout of atmospheric and climate change.

Newly formed in 2019, the Resilience SWATeam is preceded by years of groundwork put in place by local stakeholders affiliated with the University of Illinois as well as Champaign and Urbana. In February 2016, the Chancellor signed the Second Nature Climate Resilience Commitment, which calls for concrete, actionable resilience strategies to be deployed on campus. The agreement was produced to supplement the 2008 Carbon Commitment. Together, the two documents form the comprehensive Climate Leadership Commitment.

The agreement, signed by Interim Chancellor Barbara Wilson, states:

We have begun to experience the effects of climate change in our communities and we understand that these effects are projected to become more severe and damaging. We recognize that mitigation and adaptation are complementary strategies for reducing the likelihood of unmanageable change, managing the risks, and taking advantage of new opportunities created by our changing climate.

The commitment spurred the formation of the Champaign County Climate Resilience Task Force (CCCRTF), which includes Illinois professors and subject matter experts as well as representatives from local organizations. Following an in-depth climate resiliency assessment in 2018, The CCCRTF identified three primary goals. One of these entailed signing the Joint Resilience Proclamation in October 2018. This document, cosigned by Chancellor Robert J. Jones and the mayors of Urbana and Champaign at iSEE's annual Congress event, resulted in the formation of the Resilience SWATeam as it operates today.

Resilience measures undertaken from 2015 to 2019 include:

- The Resilience Commitment was initiated as an iCAP Working Group (iWG) recommendation in 2015. The iWG said:

"We recommend that the Chancellor sign Second Nature's Climate Commitment, which adds a Resilience Commitment (addressing climate adaptation) to our existing Carbon Commitment (focused on carbon neutrality). This commitment would involve partnering with the local communities to perform a resilience assessment, developing resilience indicators that are appropriate for our campus, and incorporating resilience targets into

the iCAP. Additionally, should the campus choose to sign by January 4, 2016, we would be recognized as a Charter Signatory."

- In April 2017, a Joint Task-Force for Resiliency launched and discussed methods and resources for evaluating local vulnerabilities to climate change. Their assessment¹⁰⁹ was completed in January 2018 and submitted to Second Nature as a key milestone in meeting our Resilience Commitment.
- In October 2018, Chancellor Robert J. Jones, Mayor Diane Marlin (City of Urbana), and Mayor Deborah Frank Feinen (City of Champaign) signed a proclamation affirming their "joint commitment to bolstering our community's resilience to the impacts of climate change."
- In August 2019, the Resilience SWATeam was formed.
- In Fall 2019, the City of Urbana experienced a tornado which caused damage to several trees; the University helped Urbana clean up, upon request.
- In Spring 2020, the entire community worked together with an impressive show of our local resilience to slow the spread of COVID-19 and support our most vulnerable communities. For example, University of Illinois System UI Ride shuttles provided free, public Wi-Fi hotspots at ten locations across the community.

As a twin-cities campus, one of the U of I's greatest assets is its proximity to strong local communities. Our history of climate resilience has proven that time and again, we have benefited from mutual support. Though Champaign, Urbana, Savoy, and the campus metro area are each independent entities, we are all immeasurably stronger when functioning as a unit. Not only that, but our resilience strategies will prove stronger as well. For example, strategies to improve air quality and encourage native and pollinator-supportive plantings will be exponentially more beneficial should we leverage our combined space and resources.

As we look to the future of our campus in 2050 and beyond, the efforts of the Resilience SWATeam will serve as a critical complement to the mitigation portfolio outlined in this document.

Resilience Objectives

The following Resilience objectives were developed by the SWATeams, iCAP Working Group, campus community, and Sustainability Council to guide the University's actions toward building climate resiliency in our local area.

8.1 Urban Biodiversity Master Plan

¹⁰⁹ <https://icap.sustainability.illinois.edu/files/projectupdate/5172/Initial%20Indicators%20of%20Resilience.pdf>

- 8.2 Coordinated Rainwater Management**
- 8.3 Environmental Justice Plan**
- 8.4 Local Sustainability Issues**
- 8.5 Inventory Green Jobs**
- 8.6 Vision Zero**
- 8.7 Local Offsets Program**

#8.1 [Extension w/F&S] Develop a coordinated urban biodiversity master plan by FY24 to make the Champaign, Urbana, Savoy, and campus metro area a model for biodiversity.

Maintaining biological diversity of our plants, animals, and ecosystems is one of the most impactful “first steps” we can take toward strengthening the overall resilience of our local communities.

Central to our biodiversity master plan is integrating native plants and greenspaces into our local urban areas. These efforts include:

- Tree canopies and other vegetation to manage stormwater, improve air quality, reduce atmospheric CO₂, and curb the heat island effect often experienced in built communities.
- Species of plants likely to adapt well to projected climate changes.
- Native plantings to support pollinator, insect predator, and bird habitats.

In addition to supporting native plants, pollinators, and the health of our land and water resources, our biodiversity plan supports human health and well-being. These efforts include minimizing illnesses associated with ticks and mosquitos and reducing the adverse health and environmental impacts of personal landscape and lawn maintenance practices. Urban greenspace and landscape beautification are also proven to reduce levels of anxiety and stress.

In keeping with our Engagement objectives, we want to encourage community members to become involved with and excited about these biodiversity strategies. Community gardens and food forests, which will be included in the master plan, will provide opportunities for local engagement with the ways biodiversity impacts the ground beneath their feet as well as food on their table.

As we implement the above practices, we will develop corresponding monitoring programs to assess effectiveness, making the metro area a “test bed” for informative, innovative biodiversity planning. With this information, we will draft model ordinances for use in our metro area and to share with other communities.

#8.2 [F&S w/Extension] Coordinate rainwater management plans for the entire urbanized areas of Champaign, Urbana, Savoy, and Campustown. Starting in FY21, share the total number of green infrastructure locations on the iCAP Portal on an annual basis.

To supplement the comprehensive approach outlined in the biodiversity master plan objective, we hope to implement a similar coordinated rainwater management plan for the four urbanized areas surrounding campustown.

As of FY20, campus was home to 24 green infrastructure installations. Moving forward, we hope to augment these efforts by encouraging developers to install green roofs in high-trafficked areas on campus, and support installation and monitoring of permeable surfaces and pavements. Additionally, we want to engage Facilities & Services (F&S) in designing a rainwater management plan for campus that will focus specifically on installations tailored to water resources.

Moving forward, these and other efforts will allow campus to serve as a model for rainwater management in the other three communities. Green infrastructure tours taking place during high-interest events (e.g., ACES Open House and Engineering Open House) will showcase progress and provide information.

Effective rainwater management is crucial to combating urban vulnerabilities to climate change. A specific concern is the increased frequency of droughts projected for these areas. In response, a subsection of our rainwater management plan will include a drought management plan to be implemented by all four entities.

#8.3 [iSEE] Develop a collaborative plan for environmental justice that will assess metro area resilience and actively address related issues. The plan should be written and publicized by FY24.

Many of the strategies implemented in pursuit of our coordinated biodiversity, rainwater, and drought management plans will have significant impact on local communities; for example, the correlation between increased urban greenspace and positive mental health benefits. However, we also want to address those social issues head-on.

That said, this objective is centered on the human component of climate resilience, with an emphasis on communities that have been historically marginalized, underserved, and therefore vulnerable to the impacts of climate change.

To develop a thoughtful and comprehensive environmental justice plan, we must first recognize existing programs within our local communities to identify common principles and points of contingency (at this point, these entities operate independently from one another). We aim to collaborate with other entities across campus, potentially including the Illinois Program for Research and the Humanities, School of Social Work, and the Vice Chancellor for Equity and Inclusion.

Following this initial step, Illinois faculty and students will conduct environmental vulnerability assessments of campus and local populations, identifying the communities that are most at-risk and assessing opportunities to provide valuable, sustainable solutions.

Finally, we will take the necessary steps to implement economically and environmentally feasible solutions in vulnerable communities, focusing particularly on resources to improve food

security (e.g., shuttle systems to grocery stores, food trucks, and community gardens). We will also identify locations where cooling centers are needed for residents, and seek opportunities to incorporate educational components wherever possible.

#8.4 [iSEE] Take leadership in addressing the most pressing sustainability challenges in our local communities through collaboration with local governments and related community groups, by forming an advisory panel for coordinating efforts across jurisdictional boundaries. By Sept. 30, 2022, select at least three major local sustainability issues to address and identify lead agency and key stakeholders.

As we conduct inventories and form strategies for addressing sustainability and environmental justice challenges in our local communities, we want to ensure that the issues we seek to address are treated with integrity and intentionality.

It is important for us to acknowledge that we are seeking depth and durability in the solutions we implement above all else — we're not aiming for quick fixes, but for long-term environmental and economic feasibility. By pouring the majority of our time, effort, and resources into several key issues, and collaborating closely with local stakeholders on the finer points of each, we are therefore ensuring that they will be completed to the best of our ability. A particular issue that merits consideration is the 5th and Hill campaign, which takes place just two blocks north of University Avenue.

After identifying the key issues to focus on, we will stake steps to ensure that our solutions are born out of collaboration, and are supported at the highest level possible. This will involve identifying and forming relationships with key stakeholders from Campustown, Champaign, Urbana, and Savoy. The Resilience SWATeam will function as an advisory panel for the coordination of projects between the four cooperating entities.

#8.5 [iSEE] Engage community members and local developers in climate action as outlined in previous objectives to extend the impacts from public to private land.

Previous objectives have discussed our desire to incorporate key stakeholders, government agencies, and representatives from the University and surrounding cities into our objective implementation. However, we feel passionately that community involvement and local landowners are the heart of any community and the core of all progress toward sustainability.

One of the best ways to cultivate community involvement is to spread the word about opportunities for local community members to engage in environmental discussions. We'd like to foster this passion and awareness by utilizing CCNet to spread awareness of local sustainability programs.

Below, we have identified several additional ways to engage community members in our effort toward urban sustainability and climate resilience.

Citizen monitoring initiative

As home- and landowners, individual residents have access to important and relevant metrics that we would otherwise not be able to obtain. We plan to explore the potential to encourage residents to monitor such conditions (e.g., basement flooding) and compile reports to send to decision-makers in their area. This way, those responsible for implementing community-wide change have access to accurate data, practice effectiveness statistics, and potential problem areas in the communities themselves.

Best Practices Training

Part of our campaign to engage citizens in efforts to increase local sustainability involves educating residents on how their individual practices impact the larger community. Therefore, we hope to implement incentives and best management practices (BMP) training for relevant environmental topics (e.g., a potential area for implementing this strategy is stormwater management, wherein we can develop plans to provide residents with training in stormwater utility fees).

Energy

The following avenues for community involvement pertaining to energy are slightly more demanding, as they require residents to incorporate privately-owned property (and in some cases, places of residence) into our strategies. However, cultivating this level of support will prove instrumental in creating a self-supporting infrastructure rooted in the community itself.

In the years ahead, we hope to develop plans or explore potential to:

- Decentralize energy production.
- Identify carbon-free and emission-free baseload energy generation options;
- Implement geothermal energy for extreme weather resilience in local buildings and facilities; and
- Retrofit local buildings and facilities to increase extreme weather resilience.

Joint Regulations

When conducting major projects, we will make the best possible effort to identify opportunities to adhere to appropriate regulations whenever possible. These might include LEED certification, or those regulations pertaining to solar power or green roof installation.

#8.5 [iSEE] By FY23, collaborate with colleges and community groups to inventory existing certification opportunities for green jobs and identify gaps.

While we certainly strive for engagement on a volunteer basis, integrating sustainability with the job market is a strong foundational step for ensuring the lasting resilience of any community.

Over the next three years, we will work to identify existing opportunities to green-certify jobs in the Champaign, Urbana, Savoy, and Campustown communities, with an emphasis on employing and certifying at-risk youth and adults in resilience roles (e.g., green or renewable energy design and maintenance, food security programs, and other expanding job markets).

We will also explore the [National Green Infrastructure Certification Program \(NGICP\)](#)¹¹⁰, which provides the base-level skill set needed for entry-level workers to properly construct, inspect and maintain green stormwater infrastructure (GI). Designed to meet international best practice standards, NGICP is a tool that can be used to meet a wide range of needs, including professional development for existing GI professionals and as part of a larger workforce development to provide candidates with the technical skills necessary to enter the green workforce and earn a livable wage.

#8.6 [F&S] Support Vision Zero as a county-wide goal for safe and sustainable transportation.

Vision Zero is a strategy to eliminate all traffic fatalities and severe injuries while increasing safe, healthy, equitable mobility for all. First implemented in Sweden in the 1990s, Vision Zero has proved successful across Europe — and now it is gaining momentum in major American cities. Chicago became the first city in the U.S. to adopt Vision Zero in 2012; since then, more than 20 cities across the country have committed to Vision Zero.

The Champaign-Urbana Urbanized Area Transportation Study (CUUATS), the transportation entity of the Champaign County Regional Planning Commission (CCRPC), is the Metropolitan Planning Organization (MPO) responsible for administering the federally mandated transportation planning process for the Champaign-Urbana-Savoy-Bondville-Tolono urbanized area. In December 2019, CCRPC published the Long Range Transportation Plan (LRTP) 2045¹¹¹ for the area that includes Vision Zero as an objective. The University of Illinois is an active partner of CUUATS, and therefore supports the Champaign County LRTP 2045 and commits to the Vision Zero objective.

The Facilities & Services (F&S) Transportation Demand Management (TDM) department¹¹² at the U of I works with regional transportation planning partners to coordinate the networks for all forms of campus travel, including walking, bicycling, transit, and motor vehicles. The TDM department also encourages active modes of transportation, maintains street signs and pavement markings, manages traffic closures on campus property, prioritizes pavement improvement projects, and emphasizes pedestrian safety as well as the safety of all on-campus modes of transportation. Furthermore, it is the TDM department's responsibility to implement the Campus Bicycle Network Master Plan and to explore sustainable options for transportation infrastructure and fuels. The TDM department's efforts and safety measures have resulted in zero transportation-related fatalities on campus streets in the last five years.

The City of Urbana's Bicycle and Pedestrian Advisory Commission (BPAC) passed a resolution in support of Vision Zero in late Fall 2019.¹¹³ In January 2020, the Urbana City Council Committee of the Whole and Mayor made a commitment to the Vision Zero concept by directing

110 <https://ngicp.org/about/about-ngicp/>

111 <https://ccrpc.gitlab.io/lrtp2045/>

112 <https://fs.illinois.edu/services/more-services/tdm>

113 <https://www.urbanainillinois.us/BPAC>

BPAC to bring forward a Council Resolution and Vision Zero plan for approval by the full council.¹¹⁴

#8.7 [iSEE] Establish a local offsets program by FY24.

As stated in our Transportation chapter, we are interested in pursuing local carbon offset programs, in part to mitigate greenhouse gases (GHG) generated as a result of University air travel, but primarily as a mode of educating faculty and staff about air emissions.

In collaboration with surrounding local communities, we plan to adhere to the following steps in pursuit of a results-driven carbon offsets program:

- By FY22, inventory available peer institutions and offset programs through a literature review.
- By the end of FY23, develop a plan with wide stakeholder engagement both on- and off-campus.
- By FY24, initiate the finalized plan.

Conclusion

Climate change does not exist in a vacuum; neither does climate resilience. Limiting our resilience scope to campus alone would not only impede our own progress, but also that of the surrounding communities.

It is therefore in our best interest to address issues regarding air quality, biodiversity, infrastructure, and rainwater management not as items for individual action, but as coordinated efforts to maximize all available resources and assets.

To implement lasting adaptive strategies and enact preparedness measures, we are pleased to begin conducting meaningful work in partnership with Champaign, Urbana, and Savoy, and the greater local community.

¹¹⁴ https://www.urbanaininois.us/sites/default/files/attachments/Vision_Zero_memo.pdf

Chapter 9: Implementation

Ever since the University signed its original climate commitments, we have worked to develop robust procedures for evaluating and implementing campus sustainability projects. Our network of sustainability advocates spans the Sustainability Working Advisory Teams (SWATeams) as well as related groups, and we have strengthened connectivity between existing entities such as the Student Sustainability Committee (SSC), Student Sustainability Leadership Council (SSLC), Illinois Student Government (ISG), Illini Union, and Faculty Senate. The iSEE newsletter provides a regular avenue of communication for sustainability-focused efforts to gain broad campuswide exposure, and the Champaign County Sustainability Network (CCNet) monthly brown bag meetings unite environmental advocates and professionals from across the county to network and share advancements.

The ambitious targets outlined in iCAP 2020 require continuous evaluation and intentional action from specific units, organizations, and campus leadership. Unlike our previous climate action plans, each of our objectives identifies a responsible party to help lead, implement, and monitor activity.

Capacity Development

Staffing for sustainability at the University of Illinois has evolved from a few isolated positions to a robust, cross-functional team of advocates connecting various parts of campus to the overarching movement. Many of these staff positions now include sustainability components as part of their job responsibilities; the individuals occupying these roles often serve on SWATeams, the iCAP Working Group, and/or play a role in other sustainability programs and activities.

Examples of these positions include:

- Associate Director for Capital Planning (Office of the Provost)
- Associate Director of Sustainability (F&S)
- Assistant Director of Dining, Facilities and Equipment
- Director of Transportation and Automotive Services (F&S)
- Transportation Demand Management Coordinator (F&S)
- Sustainability Programs Coordinator (iSEE)
- Sustainable Transportation Assistant (F&S)
- Zero Waste Coordinator (F&S)
- Associate Director of Utilities and Energy Services (F&S)
- Academic Program Instructor/Advisor (iSEE)
- Director of Operations (Union)

As sustainability continuously becomes a greater priority on campus, we must increase our staffing capacity to ensure success of programs and activities.

Procedures

The iCAP is rewritten every five years to evaluate progress toward our Climate Leadership Commitments and identify new and/or updated objectives and strategies. The SWATeams submit initial input for the objectives to the iCAP Working Group (iWG). The iWG provides guidance throughout the drafting process by offering feedback from represented groups, stakeholders, and the public. The iCAP draft is then reviewed and forwarded to the Sustainability Council for Chancellor approval. Numerous public input opportunities are made available prior to this final step.

Our Formal Procedures for Sustainability provide a solid framework for review and evaluation. This allows us to focus on the material benefits and challenges of the ideas brought forth rather than dwell on time-consuming administrative burdens (e.g., repeatedly identifying the correct individuals to speak with, avenues to obtain approvals, etc.). Following several years of the SWATeam process, we added feedback loops and increased communication between the sustainability advocates, decision-makers, and responsible units.

The SWATeams are instrumental to the implementation process by recommending specific sustainability projects, activities, and policies to the iWG. The iWG transmits these recommendations to the appropriate campus unit(s), though the recommendation itself may require approval from a funding authority independent from the responsible unit. Major units who take charge of the implementation and the recommendations include iSEE, F&S, the Illini Union, and Illinois Extension.

Once a recommendation is supported by its designated campus unit, there are often details in need of resolution prior to successful implementation. The unit in question is responsible for leading implementation efforts and providing regular updates, which are reviewed by the iSEE Sustainability Programs Coordinator. The iWG provides support and works with the units to overcome challenges and ensure successful implementation.

Large-scale project recommendations with major impacts on policy and/or budget are discussed at biannual Sustainability Council meetings. The agenda is set by the iSEE Director and chaired by the Chancellor. Unlike the SWATeams and the iWG, the Sustainability Council has decision-making authority to implement new strategies, programs, and policies. Starting in Fall 2020, an update to the Formal Procedures for Sustainability will include an added layer of feedback and evaluation by a task force. This subcommittee of the Sustainability Council is designed to evaluate the assessments and address uncertainties prior to the Council meeting.

These Formal Procedures for Sustainability are designed to prioritize continuous review and may be further revised to focus on the realization and implementation of sustainability projects and activities. We will continue working with organizations across campus, such as Illinois Student Government, Student Affairs, and Auxiliaries, to strengthen our efforts between University administration, faculty, staff, and the student body. The University must prioritize these efforts by incorporating them into the University Strategic Plan when it is updated in 2023.

Funding

In order to implement new projects and maintain existing activities, securing financial support for our objectives is a necessity. A variety of financing mechanisms are currently in place to fund sustainability projects and help us achieve our ambitious goals.

Campus Utilities Budget

Illinois currently spends \$90 million per year on campus utilities, which include steam and electricity, campus-owned stormwater sewers, sanitary sewer costs, potable water supply, renewable energy Power Purchase Agreement (PPA) costs, and the campus electrical distribution network. The Campus Utilities Budget is based on the annual Utility Rates and the projected annual demand for each commodity.

When the actual energy usage in a given year is less than projected, the Office of the Provost typically allocates remaining funds to energy conservation projects, including: additional recommissioning teams, the Energy Conservation Incentive Program (ECIP) financial incentives, and “quick payback” projects (which have less than a two-year timeline).

Facilities & Services (F&S)

Through the dedicated work of their staff and direct allocations from their leadership, F&S has a recurring annual budget that funds many campus sustainability efforts in their purview. One component of those efforts is ongoing funding for energy conservation, which is used for retrocommissioning, direct digital controls, and administrative support for Energy Performance Contracting. Recently, F&S also began supporting academic collaborations, such as geothermal and transportation studies, through their new Academic Collaborations initiative.

Energy Performance Contracting

As described in Chapter 2, Energy Performance Contracting allows the campus to pursue capital-intensive energy efficiency projects that offer a payback of less than 20 years. Cost savings from reduced energy consumption will be used to pay off the initial investment. This does require the campus to assume additional debt, although a stream of energy savings helps to retire that debt.

Deferred Maintenance Funding

The Academic Facilities Maintenance Fund Assessment is a student fee dedicated to reducing our backlog of deferred maintenance (work that would have ordinarily been performed in previous years, but was not performed due to a lack of funding). Where possible, these funds are preferentially deployed to address deferred maintenance projects that also reduce energy demand.

Campus, College, and Department Budgets

In addition to the above mechanisms, the Office of the Provost has made one-time allocations to support campus sustainability initiatives such as LED exit signs and the Campus Bike Center.

Several projects receive direct funding from specific colleges and/or departments. The Integrated and Value-Centered Budget (IVCB) reform increased incentives for colleges to support energy efficiency projects.

Institute for Sustainability, Energy, and Environment (iSEE)

In addition to funding iSEE administration and staff, the Institute has supported collaborative campus sustainability projects such as Eco-Olympics and Arbor Day. iSEE's educational programs have helped recruit and train future sustainability and environmental leaders, communicators, researchers, and problem-solvers. Additionally, iSEE launched a Living Lab Seed Grant program for research projects that use campus sustainability facilities from the iCAP Portal to support research efforts. This program has funded or supported 11 projects as of Spring 2020. Through "Using Campus as Living Labs", seed funding has been provided for proposal development for external funding sources. The seed funding directly contributes to campus sustainability projects; if a proposal is approved, part of external funding will also be applied to campus sustainability testbeds.

Student Sustainability Committee (SSC)

The SSC is a student-led committee charged with distributing two student fees: the Sustainable Campus Environment Fee and the Cleaner Energy Technologies Fee. The committee allocates approximately \$1 million per year to fund projects that improve campus sustainability in areas ranging from renewable energy to waste reduction and beyond, with a specific focus on direct student impact.

Bicycle Infrastructure and Programming Fee

In FY17, a \$1 per student semesterly fee was established to support recurring bicycle infrastructure and programming needs. The budget is proposed by F&S and approved by the Student Fee Advisory Committee annually, with 80% allocated to infrastructure and 20% to programming. Projects funded from this source include the bike.illinois.edu website launched in FY19 and upgraded bike parking areas.

Revolving Loan Funds

In 2011, the SSC funded a Revolving Loan Fund (RLF) at the Illini Union with a fund of \$1M. In 2012, a campus-level RLF was established with funding from the SSC and the Office of the Chancellor as a source for utility conservation projects that pay themselves back through utility savings in less than 10 years. Through additional contributions and a small interest charge, the campus-level RLF has grown to over \$4M (Figure 21), and the total of both RLFs is now \$5,131,042.

Total Balance of Revolving Loan Fund (\$)

Measured at Fiscal Year End

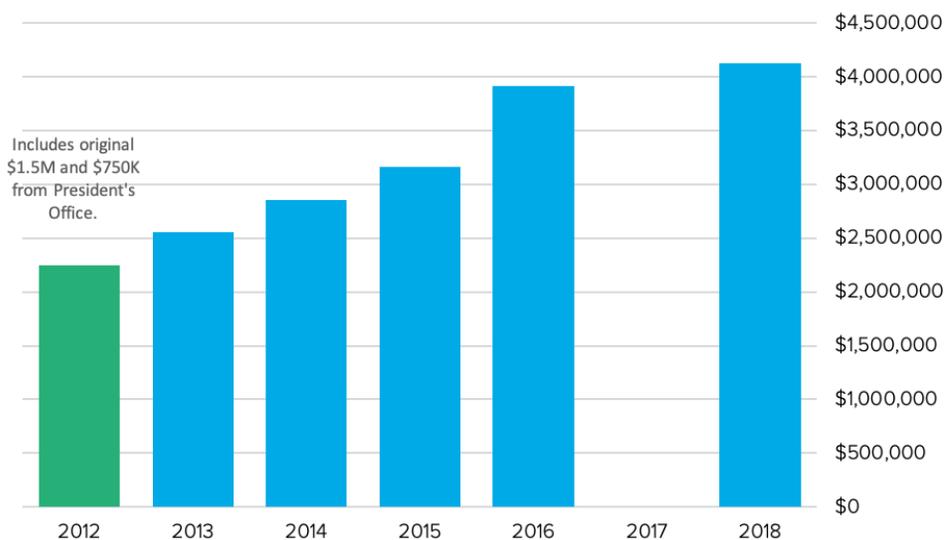


Figure 21: Balance of Campus-Level Revolving Loan Fund (RLF)

External Grants

Our campus has been quite successful in applying for grants from the Illinois Department of Commerce and Economic Opportunity (DCEO) and the Illinois Clean Energy Community Foundation (ICECF) to advance our sustainability objectives. Since FY08, the University has been granted more than \$20M for energy-related projects. One of the most notable current grant-funded projects is the [\\$15.7M federal grant to the Multimodal Corridor Enhancement \(MCORE\) Project](#) in the heart of campus.

A recent ICECF grant was awarded in collaboration with the Champaign County Design and Conservation Foundation and University Extension for the Red Oak Rain Garden (RORG).

Carbon Credits Sales Fund

In FY15, the Bonneville Environmental Foundation funded the retirement of the University's FY12, FY13, and FY14 carbon emission reductions as part of the Chevrolet Campus Clean Energy Campaign. Because those credits were retired on behalf of the planet, we retain credit for these emission reductions in our greenhouse gas (GHG) emissions reporting. In the following years, Second Nature launched a program to continuously monetize carbon emission reductions, and our campus participates in that program through iSEE. The resulting Carbon Credit Sales Fund can be used in support of iCAP projects after approval from both iSEE and F&S. At the beginning of FY20, \$883,894.25 was available in this fund (see Figure 22).

Funding Available From Carbon Credit Sales (\$)

Measured at Fiscal Year End

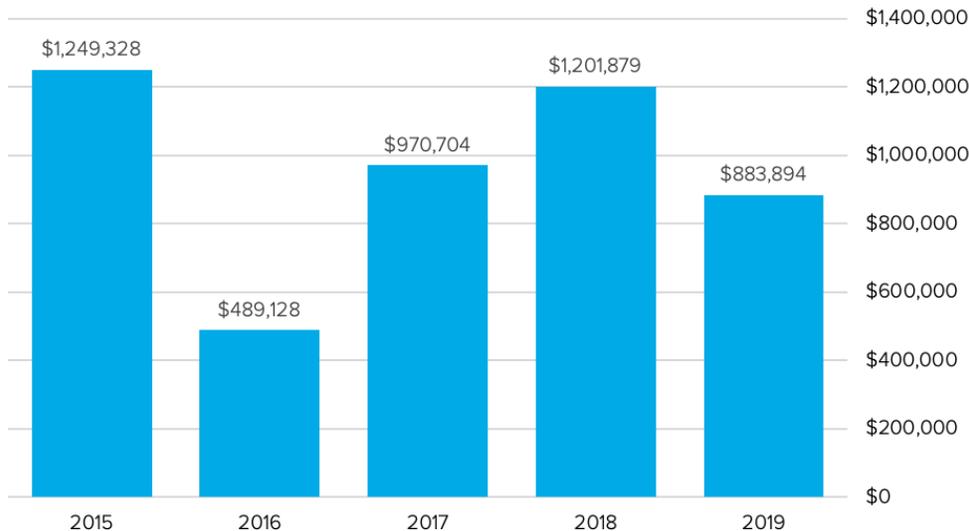


Figure 22: Carbon Credit Sales Funding

As the campus strategic plan for achieving carbon neutrality, this document estimates a degree of cost for specific plans, but it does not include detailed budgetary information pertaining to each of the objectives and/or strategies. This information will be included in future recommendations from the SWATeams. iSEE, F&S, and the SWATeams continue to work with campus entities to discuss funding potential and opportunities.

Private Donations

A highly visible success story in this category is the installation of an impressive native prairie at Florida Avenue and Orchard Street. We have also obtained generous donations that support several of our LEED-certified building projects, such as the Siebel Center for Design. There is potential to collaborate with the University of Illinois Foundation (UIF) to establish a “green fund” through which donors can financially contribute to campus sustainability efforts. Following publication of the 2010 iCAP, we created a donor fund in support of implementing the Bike Plan.

Given our enthusiasm and vision of our current students and many of our alumni, we are expecting an increase in private donations for campus sustainability projects in the future.

Implementation Objectives

Achieving all objectives listed in previous chapters and ultimately meeting our Climate Leadership Commitments remains our top priority. In addition to the topic-specific objectives outlined in chapters 2-7, the following represent overarching campus sustainability needs relevant to our long-term efforts.

- 9.1 Divest from Fossil Fuels**
- 9.2 Sustainable Investing Policy**
- 9.3 Include iCAP in Strategic Plan**
- 9.4 Become STARS Platinum**

#9.1 [Chancellor]: Fully divest from fossil fuel companies by FY25

As an institution that prides itself on being "a model of sustainability, energy efficiency and environmental friendliness for the world to see", it is imperative that the University's moral character and its stance on combating climate change be reflected in our investments. In divesting from fossil fuel companies, the University will reduce its contribution and association to the various environmental and social costs attached to fossil fuel companies. In order to ensure financial stability, and stop contributing to climate change and social injustice, the University of Illinois must develop a plan to replace all of its investments in fossil fuel companies with financially stable and ethical investments as soon as possible and instead reinvest in other companies .

While the Chancellor cannot make the decision for campus, a letter can instead be written in support of fossil fuel divestment.

#9.2 [Chancellor]: Commit to a Sustainable Investing Policy by FY24

As of January 1, 2020, Governor J.B. Pritzker signed the Sustainable Investing Act which "provides that all state and local government entities that hold and manage public funds should integrate material, relevant, and useful sustainability factors into their policies, processes, and decision-making". We aim to formally commit to a Sustainable Investing Policy in order to comply with the Sustainable Investing Act.

#9.3 [Chancellor]: Incorporate iCAP in the next campus Strategic Plan

Incorporating the iCAP in the next campus Strategic Plan is a significant step in recognizing sustainability as a campus priority. This would affirm our commitment to reducing our environmental footprint and achieving carbon neutrality. Sustainable activities, programs, and planning are necessary components of our campus vision. We aim to be proactive in our efforts and continue to be an exemplary model in setting and achieving ambitious goals.

#9.4 [iSEE]: Achieve STARS Platinum rating from the Association for the Advancement of Sustainability in Higher Education (AASHE) by FY30

The Sustainable Tracking, Assessment, and Rating System (STARS) is a self-reporting framework which, based on 17 impact areas, ranks and benchmarks our sustainability initiatives. We are currently ranked gold and strive to achieve platinum status. Striving for platinum status provides the opportunity to continuously evaluate both our short- and long-term goals.

Comprehensive List of Objectives

Objective	Objective Short Name	Draft Objective description	Responsible Parties	Implementation Difficulty	Funding Level
1	Carbon and Resilience Commitments	Meet the Climate Leadership Commitments.	Chancellor	high	high
2.1	Energy Planning Document	By FY24, develop a comprehensive energy planning document that includes a detailed strategy for meeting the FY50 net-zero greenhouse gas (GHG) emissions goal.	F&S	high	high
2.2	Increase Energy Efficiency	Reduce Energy Use Intensity (EUI) of University facilities from the FY08 baseline by: 45% by FY30, 50% by FY40, and 60% by FY50.	F&S	med	high
2.2.1	Improve Space Utilization	Improve efficiency of space use by minimizing the square footage per person and updating the Space Policy in the Campus Administrative Manual (CAM) by FY23.	Provost	low	low
2.2.2	Reduce Building-level Energy	Reduce the total annual energy consumption of each college-level unit by at least 20% from the FY08 baseline by FY30.	Facility Managers w/ F&S	med	high
2.3	Clean Energy Sources	Use clean energy sources for 15% of total campus energy demand by FY30.	F&S	high	high
2.3.1	140,000 MWh/year Clean Power	Use at least 140,000 MWh/year of clean power (about 30% of annual power demand) by FY25.	F&S	med	high

2.3.2	Clean Thermal Energy	Use at least 150,000 MMBTU/year of clean thermal energy by FY30.	F&S	high	high
2.3.3	Convert to Hot-water Heating	Support the transition to electric heating by converting 25 campus buildings to hot-water, low-temp heating systems between FY20 and FY24.	F&S	med	high
3.1	Fleet Replacement Plans	Improve University-owned vehicle fuel efficiency through the establishment of written replacement plans for at least 80% of campus fleets by FY24.	Fleet Managers w/F&S	med	low
3.2	Increase Pavement Condition Index	Increase the Pavement Condition Index (PCI) for university-owned roads so the average PCI score is at least 65 by FY25 and at least 70 by FY30	F&S	med	high
3.3	Electric Vehicle Task Force	Establish an Electric Vehicle Task Force to identify key goals for supporting the use of electric vehicles on and off campus by FY22.	Parking	low	low
3.4	Reduce Driving on Campus	Reduce the percentage of staff trips made using single-occupancy vehicles from 60% to 50% by FY25 and 45% by FY30.	F&S	high	med
3.4.1	Car Free Commuter Program	Develop a Commuter Program (Bus, Bike, and Hike) for faculty and staff. Register 100 people by FY24 and 500 people by FY30	Parking w/F&S	med	med
3.4.2	Implement Campus Bike Plan	Continue to implement the 2014 Campus Bike Plan.	F&S	med	high

3.4.3	Telecommuting Policies	Establish telecommuting policies for the campus by FY24.	F&S w/IHR	med	low
3.5	Offset Air Travel Emissions	Reduce net air travel emissions from FY14 baseline: 50% by FY24; 100% by FY30.	iSEE	low	low
4.1	Reduce Water Consumption	Reduce potable water consumption to 721,500 kgal/year by FY24, which is a reduction of 45% from the FY08 baseline.	F&S	med	med
4.2	Implement Resilient Landscape Strategy	Implement the Resilient Landscape Strategy recommendations by FY24.	F&S	med	high
4.2.1	Increase Number of Trees	Increase the number of trees on campus by 1,500 by FY24 and by 3,000 by FY30.	F&S	med	high
4.2.2	Increase Pollinator Friendly Areas	Increase the number of on-the-ground pollinator-friendly landscaping areas on campus by 50% from the FY19 baseline by April 2024.	F&S	med	med
4.2.3	Double Green Infrastructure Installations	Double the number of on-campus green infrastructure installations from 24 to 48 by FY24.	F&S	med	high
4.3	Cover Crops on South Farms	Use cover crops in at least 20% of South Farms acreage by FY24.	ACES	high	high
4.4	Monitor Soil Health	Monitor soil health by Collecting soil analyses for all South Farms land parcels, using the LabCore System, by FY24.	ACES	high	low
4.5	Food Literacy Project	Implement Food Literacy Project by FY24 by tracking carbon, nitrogen, and water footprints for food items in campus dining halls.	Housing	high	med

5.1	Sustainable Procurement Reports	Increase understanding of and compliance with sustainable procurement requirements, with 100% of business managers completing an annual sustainable procurement report by FY24.	Purchasing	high	low
5.2	Reduce Landfilled Waste	Reduce the total campus waste going to landfills by at least 10% from the FY19 baseline of 5,049 tons by FY24.	F&S	high	high
5.2.1	Install Appropriate Infrastructure	Install appropriate waste collection infrastructure throughout the University District, with new indoor bins placed in at least 150 buildings by FY24.	F&S	high	high
5.3	Establish a Culture of Reuse	Establish a culture of reuse, with 2 major campuswide zero-waste events using durable goods and composting in FY21, 4 in FY22, 6 in FY23, and 8 in FY24.	F&S w/Provost	med	med
5.3.1	Zero Waste Messaging Campaign	Develop a comprehensive Zero Waste messaging campaign by FY21, and achieve a cumulative total of 10,000 "Use the Bin" pledges by FY24.	F&S	med	med
5.4	Reduce Food Scraps	Promote food scraps reduction on campus through a behavior change campaign and tracking, recovery of surplus food, and food donations, with at least five new areas tracking and reporting their food waste by FY22. Reduce food waste by 30% by FY24	F&S w/Illini Union	med	med

		for all newly tracked locations.			
5.5	Plan for Organic Waste	Develop a detailed comprehensive plan including implementation and operational costs/benefits to sustainably dispose of all food scraps and other organics by FY24, and fully implement the plan by FY33.	F&S	high	high
5.6	Use Local Food	Increase the use of local food to 35% by FY30.	Housing	med	med
5.6.1	Food Literacy Project	Implement Food Literacy Project by FY24 by tracking carbon, nitrogen, and water footprints for food items in campus dining halls.	Housing	high	med
5.7	Green Cleaning Program	Establish a green cleaning program that meets LEED v.4 requirements by FY24.	F&S	med	med
6.1	Broaden Sustainability Education	Broaden the availability of sustainability education across the entire curriculum, beginning with orientation of freshman year and continuing through commencement, with at least one of the three proposed methods implemented by FY24.	iSEE	med	med
6.2	Sustainability Course Catalog	Establish a comprehensive online repository for courses and academic programs with sustainability content.	iSEE	med	low

6.3	Environmental Leadership Program	Launch an undergraduate Environmental Leadership Program (ELP) that includes two week-long residential intensives, pre-professional workshops, visiting speakers, and field trips to Springfield and Washington, D.C.	iSEE	low	med
6.4	Sustainability Internship Program	Develop a sustainability internship program through partnering with businesses, nonprofits, local government, and cultural institutions in Central Illinois. The total number of internships awarded will be reported each year	iSEE	med	low
6.5	Sustainability at Career Fairs	Incorporate sustainability opportunities for at least three career fairs per year beginning in FY21.	Career Center w/iSEE	low	low
6.6	Graduate Certificate in Sustainability	Offer a new graduate certificate in sustainability by FY24.	iSEE	med	low
7.1	Green Certifications	Enhance the overall culture of sustainability on campus, and increase the number of certified green offices and certified green labs by 20% each year from FY20 to FY24.	iSEE	low	low
7.2	Sustainable Events Program	Develop a Sustainable Events Program by FY23, with 100% of the Illini Union Board events qualifying in FY24.	Illini Union	med	low
7.3	Green Sports Alliance	Increase visibility of campus sustainability efforts by joining the Green Sports Alliance through the Division of Intercollegiate Athletics	DIA	low	low

		(DIA) by summer 2021.			
7.4	Local Collaborations	Incorporate sustainability-related problem solving in the GivePulse system for public engagement, and track local collaborations for sustainable solutions. Increase local collaborations by 10% per year from FY22 to FY24.	iSEE	med	med
7.5	Support Youth Sustainability	Support programs to develop love of nature and sustainability among children, with an annual Youth Sustainability Summit led by local teenagers with guidance and mentoring from campus and community sustainability leaders.	Extension	med	low
7.6	iCAP Portal updates	Update the iCAP Portal on a monthly basis to report progress toward iCAP objectives	iSEE	low	low
8.1	Urban Biodiversity Master Plan	Develop a coordinated urban biodiversity master plan and implementation working group to consider future climate conditions and make the Champaign, Urbana, Savoy, and Campus metro area a model for biodiversity.	Extension, w/F&S	high	med
8.2	Coordinated Rainwater Management	Coordinate rainwater management plans for the entire urbanized areas of Champaign, Urbana, Savoy, and Campustown. Starting in FY21, share the total	F&S, w/Extension	high	high

		number of green infrastructure locations on the iCAP Portal on an annual basis.			
8.3	Environmental Justice Plan	Develop a collaborative plan for environmental justice that will assess metro area resilience and actively address related issues. The plan should be written and publicized by Dec. 31, 2022.	iSEE w/ISG	high	high
8.4	Local Sustainability Issues	Take leadership in addressing the most pressing sustainability challenges in our local communities through collaboration with local governments and related community groups, by forming an advisory panel for coordinating efforts across jurisdictional boundaries. By Sept. 30, 2022, select at least three major local sustainability issues to address and identify lead agency and key stakeholders.	iSEE	high	med
8.5	Inventory Green Jobs	By FY23, collaborate with colleges and community groups to inventory existing certification opportunities for green jobs and identify gaps.	iSEE	med	low
8.6	Vision Zero	Support Vision Zero as a county-wide goal for safe and sustainable transportation.	F&S	low	med
8.7	Local Offsets Program	Establish a local offsets program by FY24.	iSEE	high	high

9.1	Divest from Fossil Fuels	Fully Divest from fossil fuel companies by FY25	Chancellor	high	med
9.2	Sustainable Investing Policy	Commit to a Sustainable Investing Policy by FY24	Chancellor	high	low
9.3	Include iCAP in Strategic Plan	Incorporate iCAP in the next campus Strategic Plan	Chancellor	low	low
9.4	Become STARS Platinum	Achieve STARS Platinum rating from the Association for the Advancement of Sustainability in Higher Education (AASHE) by FY30.	iSEE	high	high

Challenges

We have set bold and ambitious sustainability goals for this campus. However, we continue to face financial and institutional barriers which we continually work to overcome. It remains a possibility that there may not be sufficient funding or resources available to carry out our sustainability efforts; for example, many budgets were restricted as a result of the COVID-19 pandemic.

Despite the overlap between our proposed projects and existing plans, we still face funding challenges to maintain and grow sustainability activities. Additionally, the collaborative nature of these objectives — while vital to their success — presents the challenge of coordinating multiple entities in sight of a common goal.

Beyond funding and personnel, an added technical challenge is monitoring the progress of our objectives. While we attempt to accurately measure the success of all activities, quantifying the impact of certain programs (e.g., our behavior change campaigns) poses a particular challenge.

As we work to expand our outreach and engagement efforts, a final challenge is reaching all individuals on campus. We want to ensure that every person is aware of our goals as well as what actions can be taken to contribute to the success of our programs. Our goal is that all campus members — including students, faculty, staff, and administration — recognize sustainability as a priority in both our community and lifestyle choices.

Our Illinois campus community has committed to improving sustainability efforts and reaching carbon neutrality; while we have set aggressive goals and a high sustainability standard, we can all work together to achieve this shared vision.

Conclusion: Reaffirming Our Commitment

In 2008, the University of Illinois at Urbana-Champaign formally committed to achieving carbon neutrality as soon as possible. As evidenced by the preceding chapters, we have no shortage of innovative ideas to realize this ambitious goal, and no shortage of determined individuals to see our strategies through. With the approval of this 2020 Illinois Climate Action Plan, we reaffirm our pursuance of this commitment and look forward to accelerating our environmental stewardship efforts in the coming years.

To conclude, we'd like to reiterate a concept that surfaces throughout this document: neither climate change nor resilience strategies exist in a vacuum. The ways in which we as a society interpret, acknowledge, and deal with environmental issues is deeply interwoven with our approaches to other grand challenges of global scope and scale. Most recently, we have seen these parallels play out in an unprecedented way in response to the worldwide COVID-19 pandemic.

In March of 2020, Ming Kuo, Director of the University of Illinois' Landscape and Human Health Lab, provided powerful insight into the connections between the human response to the recent COVID-19 pandemic and the disruptive social and behavioral changes needed to address a very different, but no less momentous, crisis: climate change.

Kuo, a 2018 Heinz Award winner in the environment category¹¹⁵ and the University's first faculty member to be invited to speak at the World Economic Forum,¹¹⁶ commented on the dissonance that arose between expert and lay assessments of COVID-19. She called for science-backed action as the best form of resolution for medical — and ecological — catastrophe. Her comments are excerpted below:

It's like this. There are a whole lot of people who study tidal waves. They work full-time — 50 to 60 hours per week — measuring things, studying tidal waves under different conditions, over different surfaces, different temperature waters, reading and making sense of historical records of tidal waves, looking at the ocean from space.... (A scientist is, above all, an obsessive person.)

If a lot of people do this, working for their entire careers, each helping to figure out different aspects of tidal wave behavior, then that scientific community can get to be pretty good at predicting tidal waves. They're not going to be able to tell you every last thing about any given tidal wave, but they can tell you when the conditions are right. And when one is forming some staggering distance away, they can tell you there's one coming here — even when, here, the sea is calm, the sky is bright, and the day looks like any other.

¹¹⁵ <http://www.heinzawards.net/recipients/ming-kuo>

¹¹⁶

That's science. By studying and understanding the way the world works, science helps us see into the future.

When the COVID-19 wave hits, and passes, please consider that the tidal wavologists might also be right about climate disruption. And that, to prevent an even bigger wave of deaths, we can act, and should willingly make hugely disruptive changes.

Because that wave is coming, too.

Moving forward, we hope that the urgency of these and other global issues prompts society at large to take a disruptive approach to seeking out solutions. Large-scale policy, behavior change, and collaborative efforts — all of which have a localized presence in the iCAP — have proven to be transformative when backed by science and explored with intentionality.

So, if we embrace substantial change in pursuit of an ultimately sustainable future, our options for enacting meaningful change are endless.

Whether it originates on a campus, in a community, or at the state, national, and global scales, here's to the power of disruptive decision-making, powerful behavior change, and long-lasting climate action.

Appendix A: Acronyms

Appendix B: Figure list

Appendix C: Contributors

Appendix D: Honorable Mention Objectives

Explanation

The objectives included in iCAP 2020 were formulated, drafted, and finalized as a result of hard work on the part of countless individuals. Integral to this process are the undergraduate and graduate students who consistently contributed their evenings to participate in our monthly Student Input Sessions. We were impressed and humbled by the ingenuity, respect, and kindness that immediately became characteristic of these discussions. The meetings never failed to exceed their allotted time slots, and we could count on departing with page after page of creative suggestions in hand.

We take pride in the fact that many of the objectives included in this document originated from these student suggestions. With added insight from the SWATeams, iWG, and stakeholder groups, we turned these promising ideas into actionable, measurable targets that the University will be held accountable to adopt. We feel strongly that each of our published objectives is handled with integrity and seen through from beginning to end. That said, while only a portion of the suggestions fielded in the Student Input Sessions could be adapted into concrete objectives, we want to formally acknowledge additional ideas here, and show our appreciation for the dedicated individuals who contributed to the conversation.

These “honorable mentions” are included below, and are organized according to iCAP 2020 themes. Additional categories are identified as needed.

Funding

- Increase accountability for investing in long-term sustainable programs.
- Allocate funding from donors specifically to sustainability efforts (ex: donors will be offered the opportunity to donate to the University “green fund”).

Energy

Lighting

- By FY30, install motion sensors or timed lights in all campus buildings to eliminate excess energy usage. Consider photonically-sensitive lights, which adjust in intensity based on surrounding lighting conditions.
- Instead of lighting an entire room with a single switch, install multiple switches to control smaller sections. This will be especially effective in large rooms, where full lighting is not always required.
- Until motion detectors are installed, post stickers bearing messages such as “Turn Off Lights” throughout campus.
- Post signage throughout campus about “de-lightfulness” tips and negative effects of unnecessarily expended electricity.
- Post signage throughout campus promoting the benefits of natural light.
- Strategically construct new buildings to utilize natural light.
- Include University staff and faculty in educational communication regarding turning lights off and Illini Lights Out (ILO) events.
- Rather than advocating for a decrease in total energy use, incentivize keeping lights turned off completely.

Carbon credits

- Educate students from all disciplines about carbon credits and their significance at the University.
- Promote clean energy sources rather than retroactive carbon credit purchasing.

- Illinois-initiated projects must produce an equivalent amount of renewable energy to match each carbon credit purchased.

Fossil fuel divestment

- Divest from fossil fuels.
- Promote transparency concerning fossil fuel usage.
- Replace fossil fuel energy with renewable energy without increasing consumption.

Other:

- Decentralize the University steam pump system to make each building's temperature individually adjustable.
- Introduce small-scale rooftop solar electrical grids to ten campus buildings by FY35. Fund a feasibility study to determine the best candidates for this project by FY22.
- Green-certify all new buildings, prioritizing energy code compliance audits.
- Demand University accountability for net-zero emissions.
- Collect and publish data on the amount of energy used per building to incentivize energy reduction.
- Utilize communication strategies to amplify awareness of energy-saving competitions (e.g., the Eco-Olympics and Freezer Challenge).
- Change the energy source for leaf blowers and lawnmowers used on campus, as they do not currently include filters on their exhausts.
- Implement retrocommissioning standards to improve energy efficiency of existing campus facilities.
- Install white tiles on rooftops of University structures to reflect heat in the summer and reduce cooling needs.
- Employ an electricity cap in residence halls. Total energy usage can be measured with meters installed in each room. Low energy usage might be incentivized with prizes, while excessive energy usage could potentially result in a fine.
- Plant more trees on campus to sequester increased quantities of CO₂ and regulate building temperatures for HVAC needs.
- Improve window technology used in older campus buildings to decrease heating and cooling needs (e.g., passive solar design).
- New buildings must include infrastructure that allows for rooftop gardens. These will promote native plants and assist with rainwater management.
- Utilize agricultural waste and/or bioproducts for sustainable fuel production.
- Dining halls should invest in fewer high-energy production foods and support local farms.
- Exercise frugality with screens and devices in classrooms.
- Install infrastructure so that stationary bikes and ellipticals in the ARC and CRCE produce electricity.
- All new buildings must meet STARS standards.

Transportation

Bikes

- Provide more bike racks on campus.
- Improve existing bike lane infrastructure.
- Implement a bike-sharing program similar to Veoride that requires iCard registry and mandatory return stations.

Buses

- Transition all buses to run on electricity rather than gas. Advertise buses that currently run on electricity.
- Introduce affordable, sustainable busing options from Urbana-Champaign to the Chicagoland area.
- Install solar panels on MTD buses.

Cars

- Regulate gas usage for University-owned vehicles. Transition to electric vehicles whenever possible.
- Ban all driving on campus.
- Require a permit to drive on roads within the University district.
- Increase parking fees to discourage nonessential driving.
- Implement time-based restrictions to limit driving on certain streets.

Air travel

- Implement the use of airplane pools, to maximize the efficiency of necessary air travel.
- Require that the University pay 50% of carbon offset costs for University-related travel.
- Better communicate air travel emissions statistics to Illinois students, staff, and faculty to increase awareness of the issue.

Other ideas

- Launch a “Clear the Air” Challenge, where students can log points for choosing options such as carpooling, walking, biking, or other sustainable modes of transportation. This can be presented as a competition, with an associated website (e.g., cleartheairchallenge.org), and could evolve into an Urbana-Champaign or regional endeavor.
- Encourage instructors to offer extra credit to students who complete the University of Illinois transportation survey. Alternatively, consider other methods of incentivizing the survey to increase student participation.
- Reserve highly trafficked areas like Green Street (from Wright to Fourth) for pedestrians only (i.e., “superblocks”).

Land & Water

Water

- Reduce pollution in Boneyard Creek.
- Document areas prone to frequent flooding, such as the area surrounding the Foreign Language Building (FLB).
- Implement rain barrels; use stormwater to water plants and as toilet water.
- Conduct and publicize a campus water audit to identify the best opportunities to conserve water.
- Implement low-flow water fixtures in buildings with high water usage.
- Reduce use of sprinkler systems.
- Upgrade old water fountains around campus.
- Implement dual systems for septic waste in new buildings.

Other

- Increase native species plantings and “pollinator pockets” in the campus and community; construct “boundary lines” of native plants.
- Map all potential areas on and around campus for native plantings by 2022.
- At least 50% of all new plantings on campus must be native by 2022, and this figure must increase by 5% annually.
- Offer composting options for campus facilities in addition to trash and recycling.
- Offer educational opportunities for students via local Master Naturalists and Master Gardeners.
- Reduce use of herbicides and fertilizers on campus, and document where/when each are used.
- Identify places of heavy erosion, such as channel buffers and farms, and contact MRCS USDA.
- Pursue LEED Certification for campus buildings.
- Encourage the recycling center to accept more materials, such as glass.
- Empower interested students to seek out land & water research opportunities with relevant faculty.
- Incorporate land & water discussions, projects, and opportunities into relevant courses.
- Encourage no-till farming and precision fertilizer application.
- Promote polyculture on University-owned farms to promote biodiversity and sustainable agriculture.
- Increase low-mow zones to promote more natural landscapes on campus and increase habitat for bees.
- Replace turf-grass with drought-resistant mow-less grass to promote natural landscapes and decrease water usage.

Zero Waste

Recycling

- Improve education and messaging about what can and can't be recycled.
- Add more cardboard recycling bins across campus, and bins with multiple recycling options, so people make better choices.
- Pair all trash bins with recycling bins and improve signage and labeling.
- Invest in Terracycling to recycle food wrappers, toothpaste bottles, cosmetic cases & other hard-to-recycle items, especially in residence halls.
- Eliminate plastic bags in the Illini Union Bookstore (IUB) and other campus stores, or charge a fee/deposit for plastic and offer incentives for reusable bags. Target Green Street businesses as well.
- Create a system to recycle plastic bags, with centralized drop-off locations such as the Union and IUB.
- Work with Champaign-Urbana and Savoy to provide campus drop-off locations to recycle glass.
- Require RSOs to use water pitchers/coolers (rather than plastic water bottles) at Quad Day and other events.
- Require student groups that host events to separate waste into different bins (e.g., recycling and eventually compost).
- Devise a plan for recycling solar panels on campus, and require they be kept out of landfills.
- Fund a research study to determine the most effective waste reduction methods.

Food Waste

- Switch to bamboo or reusable cutlery and containers and add receptacles for compostable bowls in dining halls and the Illini Union.
- Create a sustainable meals committee.
- Use locally sourced/sustainable food and ingredients like rice, which sequesters carbon as it grows.
- Expand on initiatives like Project 4 Less, an RSO that sends excess food from Ikenberry Commons to Wesley Food Pantry. Establish an office as a local distribution center for food pantries.
- Track food consumption and survey students on their preferences, to cut waste.
- Repurpose unused meal swipes to food-insecure students: "Swipe Out Hunger."
- Incentivize Campustown businesses to use similar sustainable practices.
- Locate outside funding for an anaerobic digester for food waste and use the gas produced.
- By 2025, have dining halls set up "hauler" teams to take food waste to area composting centers.
- Conduct a cost-benefit analysis for creating a composting program on campus, updating last study in 2020, including whether University could sell compost to farmers.
- Consider hiring a commercial company, as some cities have done, to set up a program for campus and surrounding communities.

- Transition University bathrooms to hand-dryers only, or install composting system for paper towels
- Assign more employees to facilitate these projects (an F&S zero-waste coordinator).

Education and Outreach

- Support research efforts into natural remedies and environmentally relevant topics, especially if defunded by corporate powers.
- Implement mandatory workshops for freshmen which demonstrate sustainable practices on campus and facilitate discussion. These discussions will be led by paid volunteers with a background in campus sustainability.
- Implement additional forms of sustainability reporting, such as a carbon disclosure project.
- Conduct RA training on sustainability topics relevant to residence halls, such as dining hall food waste, so that RAs can better educate their floors.
- Increase advertisement for the Sustainability, Energy, and Environment Fellows Program (SEE FP).
- Provide sustainability peer mentoring to underclassmen by upperclassmen.
- Make University emissions data publicly accessible, and draw attention to where it can be accessed.
- Provide monthly reports on relevant sustainability data from the chancellor or other high-level administration.
- Implement sustainability tabs on each academic major's website.
- Host a yearly event in which reliable sustainable companies and professionals are invited to present seminars on sustainability in their industries.
- Construct a website or media campaign to centralize all environmental majors, minors, certificates, and programs on campus.
- Dedicate a bulletin board in the Illini Union to promote sustainability-related events and information.
- Provide training for advisors to increase their familiarity with sustainability-relevant courses.

Resilience

- By 2021, draft an alliance agreement between Champaign, Urbana, and the University to pledge environmental resiliency and implementation of iCAP objectives.
- Provide sustainability training for University Building Service Workers (BSW).
- Initiate a program that matches community projects with undergraduate student projects.
- Start a community on campus dedicated to sharing sustainable knowledge, resources, companies, and services.
- Allow environmental RSOs access to MassMail to share relevant information and events.
- Hold seminars on topics including: 5th & Hill Campaign and Middle Fork Ash Ponds.
- Provide sustainable education and training for University Grounds.

- Create and implement a curbside food and lawn waste pickup program for the Urbana-Champaign community to decrease per-household garbage volume.
- Introduce composting to Campus Dining Services, including waste carts to separate waste on-site for catering.
- Introduce an “Adopt a Bike Path” program for the Urbana-Champaign community.
- Promote “off-brand” recycling options for items such as computers and clothes.
- Send student volunteers for composting endeavors to nearby areas.
- Leverage the help of student volunteers to implement composting in campus-adjacent neighborhoods and localities.
- Start a community garden and community food forest to be maintained and enjoyed by the community.
- Promote “Meatless Mondays” in dining halls and encourage plant-based diet options.
- Draft an agreement between Champaign, Urbana, and the University to reduce mowing by at least 10% by 2022 to increase natural areas.
- Starting in FY20, all new building construction and renovation must include at least one of the following: solar panels, rooftop or building-adjacent greenspace, a native plant garden, or permeable parking and paving space.
- Replace grass and mulch patches (excluding the Quad) with native prairie patches and/or sustainable crops. Food and resources generated as a result of this project can be used on campus, or to feed community populations.

Fossil Fuel Divestment

- By the end of FY20, fully divest University of Illinois system endowment from all companies involved in extraction, manufacturing, production, and transportation of fossil fuels.
- Commit to remaining fully divested for 24 months, following the initial declaration.
- Create a publicly accessible University of Illinois system green investment portfolio, looking to other universities that have divested (such as the University of California - Stanford) for reference. Negatively screen out fossil fuel companies from this portfolio.