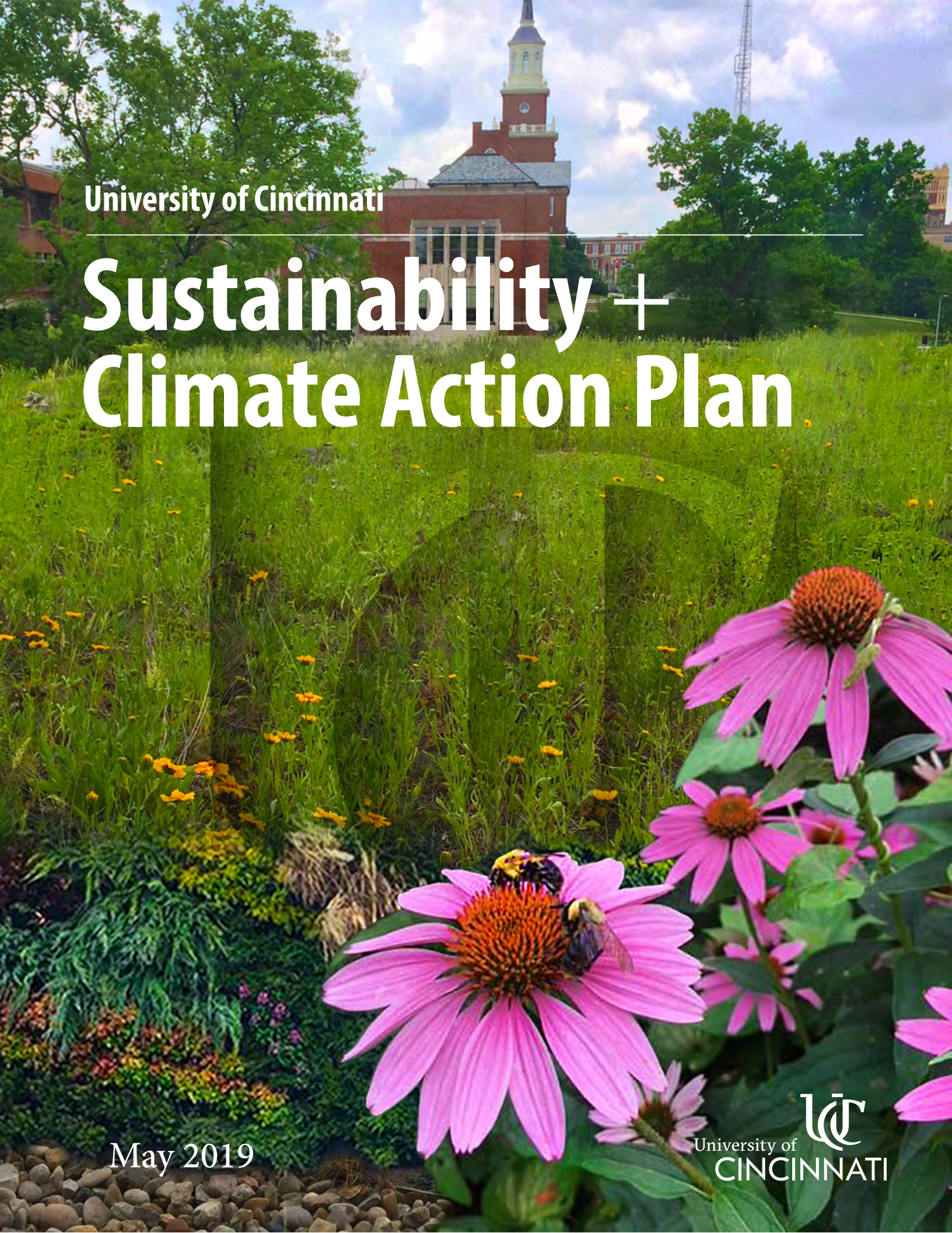

University of Cincinnati

# Sustainability + Climate Action Plan

May 2019

University of CINCINNATI

# Executive Summary

University of Cincinnati
Sustainability and Climate Action Plan 2019
Executive Summary

Although there are many pressing issues associated with climate change and global environmental degradation, there are also many reasons to hope for a brighter future of vitality and prosperity for all on our planet.

The University of Cincinnati is committed to enhancing resiliency in a future that is sustainable for all. To that end – and with the next generations to follow us in mind, we have made sustainability a priority at UC and enjoyed many notable achievements since publishing the university's first Climate Action Plan in 2009. These include earning UC a *Gold STARS* rating from the Association for the Advancement of Sustainability in Higher Education.

Much progress has been made, but sustainability is a journey, not a destination. There will always be ways for us to enhance natural ecosystems, enrich human communities and reinvest in our future. As such, **Next Lives Here**, the university's Strategic Direction, will focus on furthering academic excellence, creating a positive urban impact, and fostering innovation to positively impact social transformation.

The integration of **Next Lives Here** and this Sustainability and Climate Action Plan lays the foundation for ensuring that the University of Cincinnati will be a global leader in sustainability – whether in academics, research or operations.

I call on all colleges and universities to join us in creating an enhanced culture of sustainability.

Neville Pinto, PhD
President
University of Cincinnati

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# Chapter 1 Introduction

## Why Sustainability?

*We are living in an epoch of rapid transition, confronted by a staggering degree of social and economic inequity, political chaos, and environmental degradation—all of which pose serious threats to the vitality and prosperity of future generations and the biosphere.*

In 1992, the Union of Concerned Scientists (UCS) issued the World Scientist's Warning to Humanity report, expressing the dire concerns of the global scientific community about the state of the planet. In the same year, a global Earth Summit was held in Rio de Janeiro, at which 178 countries agreed to pursue a plan (called "Agenda 21") intended to improve human lives through "sustainable development."

Since then, the United Nations has stewarded this international collaboration in pursuit of ways to reduce poverty and conflict while protecting the natural resources and ecosystems upon which the viability of societies rest—and many leading organizations and individuals have embraced it. In 2000, nations met at the Millennium Summit to take stock of their progress and recommit to a way forward, adopting eight Millennium Development Goals, which include alleviating extreme hunger and poverty, achieving universal primary education, promoting equality for women, and promoting "environmental sustainability." Most recently, in 2015, another round of updated assessment and planning led to the 17 Sustainable Development Goals (SDGs) incorporated into the 2030 Agenda for Sustainable Development. (See Figure 1.1.)


*Figure 1.1 The 17 goals as set forth by the United Nations 2030 Sustainable Development Goals*

In November 2017, the World Scientists *Warning to Humanity: A Second Notice* was published.

*Volunteers in the UC Soiled Hands Learning Garden*

In this revision to the original report, the scientists found that nearly all of the environmental issues noted in the original study had significantly worsened, as global freshwater resources per capita have declined, oceanic dead zones have increased, deforestation has proliferated, biodiversity has decreased, human population has increased, and global temperatures have increased. The document was co-signed by more than 15,000 scientists from across the planet, making it one of the most supported documents ever published as a journal article.

The problems outlined above, and implicit in the SDGs, are interconnected and can only be solved through systemic change and intervention. The vision of sustainability is one of "peace and prosperity for people and the planet, now and into the future." Sustainability practice also recognizes that achievement of that vision requires functional systems for fair, transparent and participatory governance; healthy, robust and accessible economic conditions; a sense of connection and purpose for people and communities; and a valuing of, and protection for, local and global ecosystems.

Such change is possible. For example, in the *Second Notice* article, scientists noted that there was one trend of environmental concern that had been resolved since the original 1992 report: ozone depletion. Society's ability to curb ozone depletion through the banning of CFC's demonstrated that the international community can come together in political consensus over environmental issues, and in so doing can turn the tide toward sustainability.

Institutions of higher education have the responsibility to work towards creating a culture of sustainability, as Universities play a crucial role as agents of social change. Outside of the intellectual capital that is disseminated in academia, there is also a broader impact that universities have upon students, as students take behaviors, values, and experiences with them when they leave university, which in turn influence them for the rest of their lives. Colleges and universities also act as centers for pushing the boundaries of understanding and the capability of the human potential, through research and inter-disciplinary collaboration and by serving as living laboratories for experimentation and innovation. In addition to these unique internal characteristics associated with universities, they also significantly influence their surrounding neighborhoods, communities, and municipalities.

The University of Cincinnati (UC) is committed to leading urban public universities into a new era, through academic excellence, urban impact, and innovation, in the pursuit of a sustainable, resilient, and livable future. The University has a strong history with environmental engagement dating all the way back to the 1960's, and has established a diversity of sustainability programs, initiatives and precedents. Some recent highlights:

• The full-time position of Sustainability Coordinator was created in 2009, and an Office of Sustainability within the Department of Planning + Design + Construction in 2010. The Office now includes two full-time employees and a team of student workers known as Sustainability Advocates.

• UC is a member of the Association for the Advancement of Sustainability in Higher Education (AASHE), a professional association created to share resources and best practices, and to further sustainability leadership in higher education.

• The University has established a precedent where any new building or construction project has to abide by the United States Green Building Council's LEED (Leadership in Energy and Environmental Design) building standards. UC currently has 12 LEED certified buildings and 3 tracking for certification.

• UC offers an ongoing co-curricular sustainability lecture, film, workshop, and tour series, providing all students with the opportunity to become environmentally literate. Along with recurring events throughout the semesters, an annual student-led Sustainability Summit has taken place since 2011.


*Typical graphic for sustainability film. To reduce waste, the marketing graphic is sent electronically to a sustainability list-serve while only a few posters are printed distributed throughout the university at key locations.*

• UC developed significant programs to support multi-modal transportation options and infrastructure outside of the conventional automobile.

• Campus-wide recycling and waste diversion programs for daily operations, special event operations, and student move-in are ongoing.

• A Stormwater Master Plan looks at opportunities for how green and gray infrastructure can reduce the possibility of water pollution coming from UC's campus.

• The UC garden provides students with hands on experience with organic gardening, offers environmental education to children, and provides produce for the Bearcat Food Pantry.

These are all important and impactful steps that the University has taken, however, UC still has enormous opportunity for enhancing its culture of sustainability, as sustainability is ultimately about processes and functions, and not necessarily about reaching an end goal destination. The work of sustainability—creating a better world—is infinite, and it underlies the foundational characteristics of cultural evolution and what it truly means to be human.

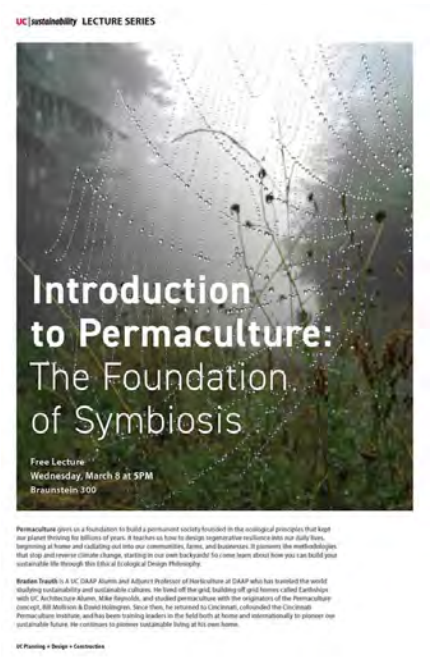
Chapters 2 and 3 of this report map out a Sustainability Plan for UC—documenting progress, opportunities, and plans for embodying that cultural evolution at the University, through education, research, co-curricular, and operational practices.

## Why Climate Action?

Of all the sustainability challenges currently posed, none is more far-reaching or urgent than that of climate change. Climate change is a disruption to atmospheric chemistry, and thus global climate systems, that results from "greenhouse gas" (GHG) pollution from fossil fuel combustion and land use changes. More than 97% of scientists from around the globe agree that it is happening, is caused by humans, and presents an existential threat to modern human civilization.

Since 1990, when the Intergovernmental Panel on Climate Change (IPCC) first issued a global warning about the threats caused by human-induced

*Planting Tree with students from LEAP Academy*




*Graphic for marketing film*

climate change, atmospheric concentrations of GHGs have increased and an increasing pattern of the visible impacts of climate change have emerged. In the US alone in 2018, four climate-related disasters costed more than $53 billion in property damage —in addition to the human toll of disruption, loss and trauma that such events bring. Changing that trajectory and preserving a livable climate for current and future generations will require rapid, far-reaching and fundamental social, economic and technological changes.

Recognizing the urgency of this issue, the University of Cincinnati first committed to climate change leadership in April 2007, when it joined what was then called the "American College and University Presidents Climate Commitment" (ACUPCC), committing the institution to model climate change solutions in its operations and to engage the issue in its education and research. UC also agreed to track, report, and reduce its own carbon footprint, in long-term pursuit of "carbon neutrality." In 2009, UC published its first Climate Action Plan.

Chapter 4 of this report maps out UC's progress over the past decade in reducing institutional emissions, and Chapter 5 includes UC's first examination of local climate risk and resilience measures. Together, these chapters sketch out an updated Climate Action Plan for UC, as a centerpiece of the University's overarching sustainability efforts.

## Accountability through Measurement & Reporting

One invaluable practice for verifying these accomplishments and helping to continue move UC forward in its goals is the utilization of robust and nationally approved verification and tracking methodologies. In higher education, there are two prominent national efforts for collaborating and reporting on climate and sustainability in higher education, and UC is an active participant and contributor to both. (See Figure 1.2)

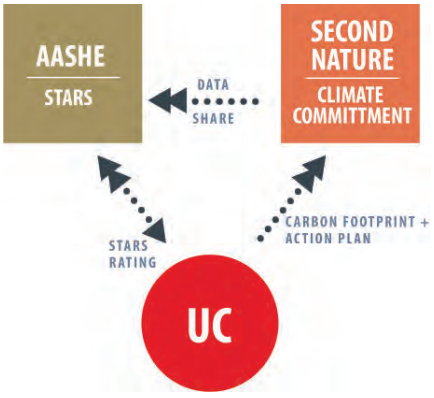



*Figure 1.2*

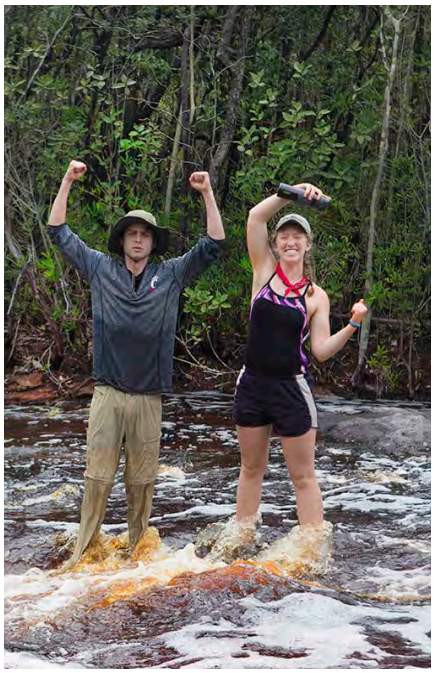
## AASHE'S "Sustainability Tracking, Assessment, and Rating System" (STARS)

STARS is a transparent self-reporting framework for colleges and universities to measure their sustainability performance. It was created by the higher education community to help reflect progress of individual institutions, and the sector as a whole, toward the embodiment of an ideal sustainable learning community.

UC completed its first STARS report in 2014, earning a ranking of Silver. Between 2014 and 2017, UC undertook several strategic sustainability initiatives that increased its ranking to Gold when it submitted its scheduled three-year update of its STARS profile in 2017.

In its latest incarnation, STARS evaluates five major aspects of campus sustainability:

1. Academics
2. Engagement
3. Operations
4. Planning & Administration
5. Innovation & Leadership



Together, these categories give a comprehensive sustainability evaluation of the campus.

One portion of this evaluation is an assessment of the institution's energy and carbon footprint and climate impact, contained within the operations sections entitled "Air & Climate," "Energy," and "Transportation." Reporting to STARS about UC's performance in these arenas was proceeded by UC's assessment and reporting for Second Nature's Presidents' Climate Leadership Commitments. (See Figure 1.2)

## Second Nature's "Carbon Commitment"

Since it became part of the Climate Leadership Network in 2007 by signing the ACUPCC, UC has developed regular analyses of its carbon footprint and reduction goals and strategies to the public reporting platform maintained by Second Nature.

By being transparent about its greenhouse gas reduction goals and progress in meeting them, UC is part of a leadership community of colleges and universities that are learning and demonstrating together the challenges, costs and many benefits of efforts to reduce campus greenhouse gas emissions. As part of these reports, UC also submits information about its work to embed climate change into its education and research endeavors.

The synergistic relationship between UC's participation in, and regular reporting to, both Second Nature and to AASHE STARS is depicted in the Figure 1.2.

Together, these two nationally recognized measurement tools have helped UC frame its sustainability objectives and goals.

## A Philosophical Approach to Sustainability

The most valuable resource for the successful implementation of this Sustainability and Climate Action Plan is UC's individual stakeholders, and the extent to which they can inspire or be inspired. UC's stakeholders are interconnected through their daily interactions. Currently, they remain an untapped resource. Yet, they possess considerable value in the form of a high energy level, a sense of poetic license and a balance between home and work life. All of which, if tapped, could improve the overall culture of sustainability at UC, and help the University meet all of its sustainability goals, including those focused on climate action, with the urgency and leadership that the issues demand.

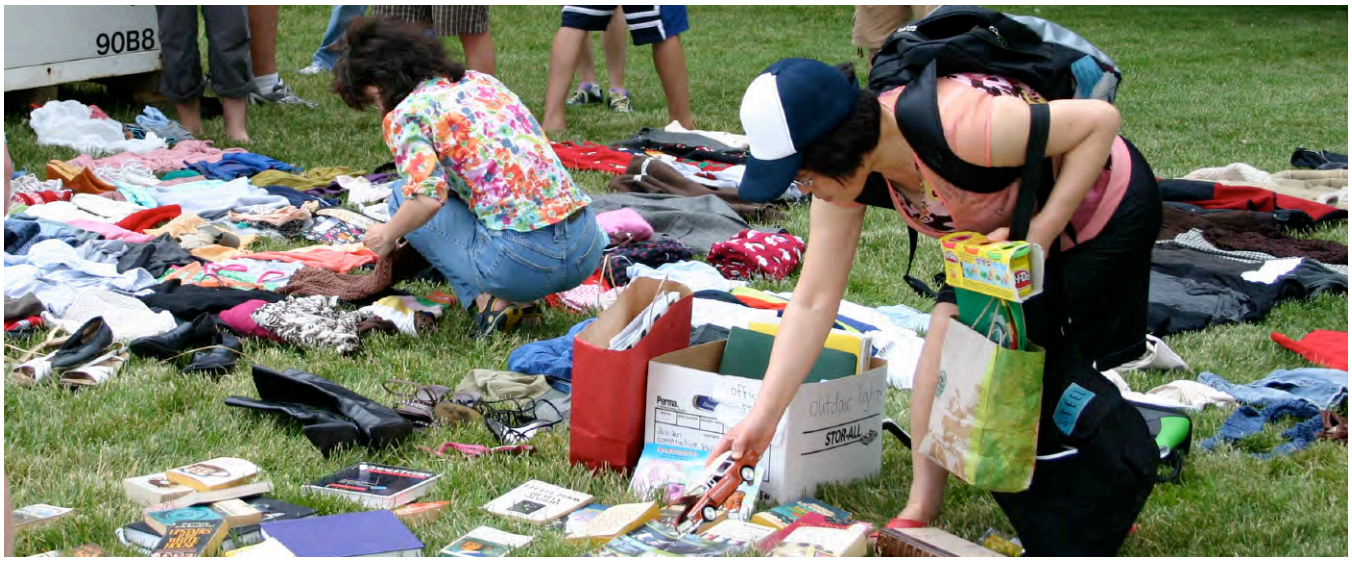
### Energy

Individuals at UC possess energy. Currently, this energy is funneled in a variety of diverse ways: students attending school full-time while working part-time, faculty teaching classes while pursuing their personal research, staff and administration maintaining the university while looking ahead to future challenges and opportunities. Within these activities are opportunities to become involved with creating sustainability and implementing elements of the Sustainability and Climate Action Plan.

To tap this energy, these individuals must see the opportunities for sustainability that exist within the activities to which they are committed. For students, it could be choosing a class or independent study that researches a certain element of sustainability at UC. For faculty, it might be incorporating examples of sustainability, including climate change, into their classes. For staff and administration, it might be making choices today that have long-term sustainable outcomes. Once this energy is harnessed, its expression becomes the next important consideration.

### Poetry

Many individuals do not relate to the mainstream. Their approach to the world and their viewpoints is best discovered in a non-linear and poetic way. Poetic expression in the context of sustainability means allowing individuals to use their energy to give expression to their concerns and ideas for solutions to sustainability challenges. Given the ways in which climate has and will necessitate massive social change, the world desperately needs this creativity. This expression can take the form of writing, speaking, mentoring, learning,




*Students participating in the annual Re*Use Market*

debating, teaching, or planning. It is important that individuals feel free to express their energy and concerns in their own way, and UC needs to be cognizant of this reality when recruiting stakeholders to implement elements of the Sustainability and Climate Action Plan.

## Live/Work

Achieving sustainability is a professional, as well as a personal, endeavor. If at home individuals recycle, turn-off lights when not in use, and conserve water, then these practices should be encouraged in their professional lives. If on campus, individuals oversee the installation of money-saving energy technologies or establish policy to change usage behavior, then they will more than likely devote resources and funding to implement similar interventions at home and in their communities. In order to ensure that full live/work synergy is fostered, individuals need support from their peers and the larger UC community for suggesting and implementing these behaviors in their personal and professional lives. Such live/work collaborations will speed the growth of UC's culture of sustainability, climate leadership and climate resilience.

*American flag graces the Rumpke Landfill, photographed during a UC sustainability sponsored tour of the Rumpke recycling facility*

## Culture of Sustainability

By capitalizing on individuals' energy, sense of poetry and live/work experiences, UC will find many individuals willing to act on their desire to have a positive impact on sustainability efforts, and who will combine experiences from their personal and professional lives to create a richer culture of sustainability at UC. Such a positive cultural environment can lead to higher individual satisfaction, promote retention among students, faculty and staff, create a green image for prospective students and ultimately make the world a better place. Such an environment will also lead to further UC community buy-in and leadership activity in support of sustaining the climate action planning process. With these challenges, considerations and potential resources in mind, this Sustainability and Climate Action Plan establishes the process for UC to achieve a more sustainable future.

# Chapter 2 Building a Campus Culture

## Building a Sustainable Learning Community - A Campus Culture

*Culture is our adaptation to the world around us, and design is the conscious process of making culture.*
*- Peter Bane*

*Student walking through the university's Mews, a lush quiet space located behind Steger Student Life Center on West Campus*

Sustainability is about actively creating communities in which meaning, beauty and connection are available to everyone, and current and future generations are afforded equal opportunity to thrive. The practice of sustainable behaviors is itself sustainable, in the most literal sense, only when driven by a set of shared values that make the most environmentally, socially, and economically responsible decisions, the ones that also result in the greatest sense of satisfaction and joy.

Through education and awareness-raising that connects a shared value of service to community to behaviors which have positive sustainability impacts, the University of Cincinnati is demonstrating leadership in pursuit of its mission to "…create opportunity, develop educated and engaged citizens, enhance the economy and enrich our University, city, state and global community."

Laying a foundation for this culture means breathing sustainability throughout every aspect of the institution: in the University's educational programs and research, in the ways in which the campus community and public are engaged, and in the social and governance structures that shape UC's planning and administration. Academic innovations, institution-wide and public engagement, and progressive governance are critical tools for ensuring that the UC campus serves as a living laboratory, in which solutions to society's most pressing problems, such as climate change, are discovered and exemplified.

# Education

Education in sustainability is what will equip students to face the complexities of the twenty-first century. Increasingly, society needs citizens who are able to understand the natural and social systems around them; think systemically and analytically about challenges; develop responses and solutions that are intellectually rigorous, culturally respectful and contextually appropriate, and that are able to be adaptive in the face of continual rapid change.

As an institution of higher education, the University of Cincinnati's greatest potential impact on the world around it is in the degree to which it is successful in its aspiration to "equip students with the knowledge, skills and attitudes for full and productive lives," expressed in the Baccalaureate Competencies outlined as part of UC's General Education core. What follows is an overview of the ways in which UC's current educational offerings provide its students essential sustainability knowledge and skills—and a review of priority action items for continuing to do so in the future.


## Academic Master Plan and Learning Outcomes

UC's Academic Master Plan holds sustainability as an integral principle and recommends that sustainability be integrated into educational programs and research. In addition, the University's Undergraduate General Education core course requirements are purposefully designed to strengthen and promote development of four important learning outcomes or competencies throughout students' progress toward their degrees: 1) Critical thinking, 2) Effective communication, 3) Knowledge integration, and 4) Social Responsibility. Taken together, these concepts and four core learning outcomes are foundational sustainability competencies.

As noted above, sustainability practice requires a value set that prioritizes stewardship and co-creation of community (i.e. "social responsibility"); in its definition of "Social Responsibility," UC elaborates that this goal requires introducing students to historical ethical reasoning, ecological literacy, contemporary social, ethical, and sustainability issues, as well as promoting knowledge, skills, and attitudes that encourage responsible stewardship and civic engagement. All of these are foundational sustainability concepts according to the "Learning Outcome" section of the national Sustainability Tracking, Assessment, and Rating System (STARS) program offered by the Association for the Advancement of Sustainability in Higher Education (AASHE). The STARS program notes that sustainability is inherently multi- and inter-disciplinary, and requires an ability to understand and think in terms of systems (i.e. UC's "knowledge integration"); to be curious, critical and adaptive (i.e. UC's "critical thinking"); and to collaborate effectively (i.e. UC's "effective communication"—coupled with emotional intelligence and teamwork that can be cultivated through work and co-curricular experiences).

## Co-Ops

Sustainability is not conceptual; it is about lived experience. It—like effective education—is active and personal. At UC, experiential education has long been an integral aspect of the student experience. The University of Cincinnati was the first in the world to develop co-operative education as a model in which students alternate traditional academic semesters with semesters spent working full-time in their chosen field. By providing students the opportunity to gain real world experience through co-ops, UC prepares them to join the work force, ensuring higher rates of employment for recent graduates. This is important, as sustainability encompasses social and economic components as well as environmental ones; the University strives to equip its students with the tools to be able to sustain themselves economically and socially during and after their time at UC.

**SUSTAINABILITY COURSES 2016-2017**

Fiscal Year 2017

| College | Undergraduate | Graduate | Total |
|---|---|---|---|
| UC Clermont/UC Blue Ash | 2 | - | 2 |
| College of Engineering & Applied Science | 32 | 17 | 49 |
| College of Medicine | 1 | - | 1 |
| Winkle College of Pharmacy | - | 1 | 1 |
| Design, Art, Architecture, & Planning | 38 | 23 | 61 |
| Lindner College of Business | 7 | 2 | 9 |
| College of Arts & Sciences | 118 | 16 | 132 |
| Professional Practice and Experiential Learning | 2 | 4 | 6 |
| **Totals** | **200** | **63** | **261** |

**SUSTAINABILITY COURSES 2017-2018**

Fiscal Year 2018

| College | Undergraduate | Graduate | Total |
|---|---|---|---|
| UC Clermont/UC Blue Ash | 3 | 1 | 4 |
| College of Engineering & Applied Science | 36 | 19 | 55 |
| College of Medicine | 1 | - | 1 |
| Design, Art, Architecture, & Planning | 22 | 41 | 63 |
| Lindner College of Business | 5 | - | 5 |
| College of Arts & Sciences | 111 | 13 | 124 |
| Professional Practice and Experiential Learning | 3 | 3 | 6 |
| **Totals** | **181** | **77** | **258** |

## Undergraduate Majors, Graduate Programs, and Course Offerings

UC offers numerous courses and programs of study, across departments and disciplines, that provide sustainability focused or related content and skills to students. Highly-respected undergraduate and graduate programs of study in natural, social and applied sciences that offer direct pathways into sustainability careers are all available.

Analysis of the 2016-2017 and 2017-2018 course catalogues highlights more than 250 courses available annually, across all seven colleges, focused on sustainability topics.

According to UC's 2016 report to AASHE STARS, two-thirds of departments across UC have sustainability course offerings. In addition, the University seeks to support enrollment and promote growth in the number of such courses by providing "sustainability" as one of the keywords that students can use to search for and select courses when they are planning their next term's course registration.

### *Directly Sustainability Focused Majors*

- Environmental Studies
- Environmental Engineering
- Horticulture
- Urban Studies
- Urban Planning
- Geography
- Geology
- Biology
- Chemistry

### *Directly Sustainability Focused Graduate Programs*

- Architecture
- Community Planning
- Landscape Architecture

### *Indirectly Sustainability Focused Majors*

Civil Engineering, Architecture, Interior Design, Anthropology, Physics, Political Science, Philosophy, Industrial Design, Sociology

## Certificate Programs

UC also offers several certificate programs that are related to sustainability skills and various industries. These certificates provide valuable new credentials for working professionals.

### *Certificates*

- Education for Environmental Sustainability Certificate
- Geographic Information Systems Certificate
- Green Roofs Certificate
- Historic Preservation Certificate
- Horticulture Certificate
- Permaculture Design Certificate
- Sustainable Landscape Design Certificate
- Urban Agriculture Certificate
- Urban Landscapes Certificate


*Attending and participating in classes for Environmental Literacy, each participant is awarded an Environmental Literacy Certificate.*

In addition, UC provides students the opportunity to earn an Environmental Literacy Certificate of Achievement through registration and active participation in the Office of Sustainability's co-curricular educational and engagement series.

*Photo on left: Green roofs workshop at the Civic Garden Center.*

*Photo above: The first Environmental Literacy Class at the University of Cincinnati.*

Students in this program earn a professional certificate from the University, outside of their traditional academic field of study, through the pursuit of engaged, self-directed learning; they are required to attend four specified discussion units, but the program is unique in its scope and helps cultivate the prime condition for self-directed learning as it allows students to choose which of a diversity of events they will attend in order to satisfy those requirements. This is a useful tool that UC can continue to leverage to enhance its sustainability education outcomes in the future.

## EDUCATION PRIORITIES / NEXT STEPS

### Create sustainability-literate graduates that become leaders in addressing the world's most critical problems

#### *Spread sustainability throughout the UC curriculum*

- Continue to measure, annually, the number of sustainability-focused and sustainability-related courses throughout all colleges and departments.
- Work with faculty to increase the number of sustainability-focused and sustainability-related courses.
- Increase the sustainability knowledge, interaction, and collaboration among colleges.

#### *Support and increase co-curricular sustainability learning*

- Ensure that every college hosts a co-curricular sustainability lecture or presentation, highlighting esteemed work and perspectives from their respective field.
- Translate academic outcomes and theory into practice on campus and facilitate the opportunities for the campus community to practice their innovative solutions and ideas.
- Increase participation in the Office of Sustainability's Environmental Literacy Certificate of Achievement.

*"At one level, the scholarship of engagement means connecting the rich resources of the university to our most pressing social, civic, and ethical problems... Campuses would be viewed by both students and professors not as isolated islands, but as staging grounds for action. But, at a deeper level, I have this growing conviction that what's also needed is not just more programs, but a larger purpose, a larger sense of mission, a larger clarity of direction in the nation's life as we move toward century twenty-one. Increasingly, I'm convinced that ultimately, the scholarship of engagement also means creating a special climate in which the academic and civic cultures communicate more continuously and more creatively with each other, ...enriching the quality of life for all of us."*

- Ernest Boyer, former president of the Carnegie Foundation.

# Research

As one of America's top public research universities, UC has long blazed trails in innovation. Considering that sustainability relies on inter-, multi-, and transdisciplinary collaboration, UC strives to forge new partnerships and relationships within the institution that break silos and create the space for progress and creativity to blossom.

## Support for Sustainability Research at UC

Traditionally, academia has seen research as something to be removed from practice; something to be undertaken in controlled settings in order to answer very specific questions organized into disciplinary silos. However, a growing movement over the past 20-plus years toward "engaged scholarship" or "public scholarship" has helped break down the walls between research and practice, and between disciplines, arguing that universities' research capacities have a vital role to play in making the world a better place by discovering and applying answers to pressing societal and environmental questions.

UC's research enterprise has begun to lay a foundation for contributing its impressive intellectual capital to the search for sustainability solutions. It is doing so in many ways—not least, the following:

***Encouraging students to undertake sustainability research:*** UC's Undergraduate Scholarly Showcase offers recognition and valuable fodder for building students' academic and professional resumes. It is a venue for students of all disciplines to present their creative and scholarly works, in which all projects are evaluated and considered for competition and the three most highly-rated projects within each Scholarly Theme receive certificate awards. Themes comprise the following, nearly all of which have sustainability elements:

- Behavior & Other Patterns of Being
- Diversity Matters
- Food, Water, Energy
- Games & Competition
- Health & Body
- Motor and Sensory Systems
- Security
- Space and Time

***Supporting faculty in sustainability research:*** The 2019 Strategic Plan and Academic Master Plan include Sustainability as an operational principle. Incentives, such as priority funding, are in place to encourage colleges and units to help achieve the UC 2019 targets—including entrepreneurial research in sustainability.


*The partnership of multiple entitites in Greater Cincinnati enabled a combined effort to combat the Asian long horned beetle infestation. UC created the marketing graphic and poster to announce this effort with the Hamilton County Re-forestation Initiative.*

***Incentivizing multi-, inter-, and transdisciplinary projects:*** Examples of departmental incentives for working with colleagues in other disciplines abound across each of UC's colleges (and are specific to each college). One example is in the College of Medicine, where rewards are given annually for meaningful multidisciplinary research efforts.

***Linking the community with existing research to inform innovation:*** The library has web-based "research guide" for Sustainability that enables students and faculty to find relevant sustainability resources. These include search keywords, links to relevant books and journals, UC research, and professional organizations.


## Open Access to Research

The research produced by universities like UC can only be as useful in solving societal problems as it is accessible to those who might need to utilize it. The "Open Access" (OA) movement seeks to make more research freely available for the public good—and in doing so it seeks to change many of the conventions of academic publishing. Given current US and global political trends toward hyper-partisanship and intractability of power, many sustainability advocates see OA as becoming increasingly more important to the University's institutional mission of serving people, the state and the world as a public research institution, by providing a truly democratic approach to the pursuit of knowledge.

Currently, UC has a voluntary, "opt-in" policy related to Open Access, and is in the process of working to increase OA policies and procedures throughout the institution. An example of Open Access research at UC can be observed in the Health Science Library, which provides an OA Guide created by the UC Health Sciences Library on the NIH Public Access Policy and Public Access Mandates. To help advance science and improve human health, the Policy requires that these papers are accessible to the public on PubMed Central no later than 12 months after publication. In addition, the UC Digital Resource Commons is a repository available to all UC researchers. The University is in the process of creating incentives for faculty to use the repository.

## Research Centers and Projects

Sustainability-focused research truly is a multidisciplinary undertaking at UC. A 2016 inventory of research projects found that roughly three-quarters of departments at UC that produce any sort of research were in fact doing work related to sustainability. These span the natural and social sciences, business and professional practice. Some examples of UC Centers that contribute significantly in the realm of sustainability research are below:

- Environmental Engineering Research Center
- Center for Environmental Genetics
- Center for Field Studies
- Center for Geospatial
- Information & Environmental Sensor Networks
- University of Cincinnati Research Center

**300 (37%) of faculty and staff are engaged in sustainability research**

**109 academic departments include faculty or staff conducting sustainability research**

**73.39% of research producing departments are engaged in sustainability research**

## Academic Year 2015 - 2016

Clearly, UC's impressive research enterprise has a great deal to contribute to advancing sustainability. The challenge now is how to ramp up such efforts for maximum impact in and far beyond the University's borders.

In 2017, the University completed the construction of the Great Miami Ground Water Observatory, which monitors water quality for over two million Ohio residents who rely on the Great Miami Valley Aquifer for drinking water. The C.V. Theis Groundwater Observatory is a catalyst for interdisciplinary field based research to better understand the intricacies of the water cycle and potential threats to public health and the natural environment. The site is a research location for students, water managers, scientists, suppliers, and regulators. UC was nationally recognized for its work with innovative research with the Great Miami Groundwater Observatory in the Association for the Advancement of Sustainability's 2017 Sustainable Campus Index.

*Photo left: Graphic Description of the new C.V. Theis Groundwater Observatory along the Great Miami River.*

*Photo above: Aerial view of the Observatory.*

## RESEARCH PRIORITIES / NEXT STEPS

### Continue to incorporate sustainability more broadly and deeply across the UC research enterprise

#### *Increase the levels of opportunity and support for faculty and students to pursue sustainability research*

- Inventory and recognize, annually, sustainability research taking place throughout the institution, by department and college.
- Translate research into practice on campus and facilitate opportunities for the campus community to practice their innovative solutions and ideas regarding sustainability.
- Increase the number of research-based projects or competitions that require students and faculty from different departments and colleges to collaborate.

#### *Expand and increase opportunities for Open Access*

- Work to establish a wider recognition across all colleges and departments of the value of an Open Access approach to research.
- Work to establish a campus-wide Open Access policy as a default, with "opt-out" if/as necessary.

## Campus Engagement

Collaboration is key to the vitality of sustainability efforts at the University. Working interdependently, UC can arrive at more democratic, legitimate and comprehensive approaches to the most pressing issues that it faces. In addition, by inviting members of the community to collaborate in learning about the ways in which sustainability challenges show up outside of the classroom and laboratory, sustainability values and behaviors can be explored, demonstrated, refined—and internalized. The result: students, faculty, staff and community members become educated and empowered to become proactive agents in creating a better world.

### Vision and Mobilization

In February of 2018, President Neville Pinto laid out the University's new strategic direction, *Next Lives Here*. The "urban futures" component of the vision speaks powerfully to the University's potential to infuse a sustainability ethos through education, engagement and innovation: "Both locally and globally, Urban Futures will deepen our commitment and broaden our impact in the interdisciplinary areas of real-world learning, problem-based scholarship and research, and community-based partnerships."

next lives here

*Wordmark of the University of Cincinnati's new strategic direction* Next Lives Here.

This aspect of the *Next Lives Here* vision builds upon UC's legacy of sustainability leadership over the past fifteen years, as a member of the Association for the Advancement of Sustainability in Higher Education (AASHE), a participant in the Sustainability Tracking, Assessment, and Rating System (STARS), and a part of the Climate Leadership Network. Through all of these commitments, UC has sought to bring resources—best practices, relevant tools and useful context—to bear in infusing sustainability across its own campus. In so doing it has also been a model nationally, advocating through example as to the benefits of, and need for, more sustainable institutions of higher learning.

Strategies for guiding the integration of sustainability across campus have, for more than 15 years, been guided by the President's Advisory Council on Environment & Sustainability (PACES), an All-University Committee founded in 2003 as the Environmental Sustainability Committee (ESC). (Its name was changed in 2007). The committee is composed of students, faculty, and staff, and is open to all members of the UC community. PACES has helped laid the groundwork for all of the sustainability coordination and collaboration across campus—highlights of which follow.

## Office of Sustainability

UC hired a part-time Sustainability Coordinator in 2008, made the position full-time in 2009, and established an Office of Sustainability in 2010, housed within the Department of Planning + Design + Construction with links to Facilities Management and Central Utilities. A team of 10-15 student employees known as Sustainability Advocates help to facilitate the various programs and initiatives of the Office. In 2018, the Office grew by hiring a full-time Assistant Sustainability Coordinator.


The Office of Sustainability is the primary driver of sustainability-focused engagement and programming at UC, including the UC Bike Kitchen, Bearcat Bike Share, UC Garden, Athletics and Special Event Recycling, Re*Use Market, Annual Cincinnati Bike Show, Soiled Hands Learning Garden and Operation Move-In Recycle. It coordinates internal collaborative initiatives—such as the efforts, undertaken in collaboration with Campus Services, to implement "trayless" dining and to eliminate the distribution of plastic bags at some food service locations on campus.


**UC SUSTAINABILITY EVENTS**

| | Event Type | Attendance |
|---|---|---|
| 2016 | Films | 169 |
| | Lectures | 130 |
| | Workshop/ Special Event | 22 |
| | Tour | 18 |
| | Annual Student Sustainabilty Summit | 60 |
| | Annual Bike Show | 150 |
| | City Wide Clean Up | 52 |
| | Community Bike Ride | - |
| | Move In/Move Out Waste Diversion | 10,878 |
| | Recycling | 80 |
| | PACES (All University Sustainability Committee) | 31 |
| | **Total** | **11,590** |
| 2017 | Films | 456 |
| | Lectures | 353 |
| | Workshop/ Special Event | 78 |
| | Tour | 64 |
| | Annual Student Sustainabilty Summit | 60 |
| | Annual Bike Show | 60+ |
| | City Wide Clean Up | 1800+ |
| | Community Bike Ride | 161 |
| | Move In/Move Out Waste Diversion | 11,987 |
| | Recycling | 284 |
| | PACES (All University Sustainability Committee) | 109 |
| | **Total** | **13,096** |

*Above: Graphics and events illustrate the activity and engagement by UC Sustainability throughout the year.*

*Photo on right: Students attending workshops at the annual Sustainability Summit*

As one strategy for engaging campus stakeholders, the Office of Sustainability hosts and facilitates co-curricular educational opportunities such as the sustainability film, lecture, tour and workshop series; it also organizes more proactive events such as city-wide clean ups community bike rides, and tree plantings.

The premier annual sustainability event at UC is the student led and organized Sustainability Summit, which has taken place on a weekend during the fall semester every year since 2011.

This retreat is funded by the Office of Sustainability. It is held at a state park, and features workshops on a variety of sustainability issues and solutions. At the end of the weekend, the students bring back projects they would like to see executed at the University, and form focus groups that work on those projects. Water bottle refill stations and a living wall have been

placed on campus as a result of these student projects. The Summit is successful in creating physical changes to campus to enhance sustainability, but also in enhancing the non-physical culture of sustainability, facilitating a space for students to grow in community together and learn from one another different sustainability practices. It is an inclusive, mindful environment that carries over into campus in the everyday lives of those who attend.

## Other Campus and Student Organizations

In addition to co-curricular educational events hosted through the Office of Sustainability, a wide variety of educational programming organized through other offices and organizations relate to and advance sustainability efforts on campus. These include (but are not limited to) the Center for Community Engagement, African American Cultural Resource Center, Women's Center, Student Wellness Center, and LGBTQ center. There are likewise a variety of student clubs and organizations that incorporate elements of sustainability into their mission, operation, and vision, such as:

- ASME BikeWorks!
- Clean Up Cincy
- DAAPcares
- Engineers Without Borders
- Environmental Law Society
- Leaders for Environmental Awareness and Protection (LEAP)

- Mountaineering Club
- Ornithology Club
- Planning Students Organization (PSO)
- Serve Beyond Cincinnati
- Society of Environmental Engineers
- UC BeeKeeping Club
- UC Cycling Club
- UC Students for Burnet Woods
- UC Veg Health Club
- US Green Building Council student chapter

UC's Office of Sustainability works with and supports the efforts of many of these groups. Together, all of these partners are working to build UC's sustainability culture—an enterprise that can never have an end point, but that is continually shifting and changing as UC's students, faculty and staff come and go.

## CAMPUS ENGAGEMENT PRIORITIES / NEXT STEPS

### Continue to reinforce sustainability as a shared community value and empower students, staff, and faculty to adopt sustainable behaviors

#### *Increase outreach programming for all students*

- Continue to reach out to all students about UC Sustainability.
- Increase the presence of Sustainability Advocates by offering leadership opportunities to empower them and give them a sense of ownership on sustainable initiatives.
- Increase tabling and outreach efforts to expand the presence of UC Sustainability on campus, while educating the campus community on sustainability.
- Collaborate with multiple university offices on campus to support and engage as diverse an array of students as possible.
- Increase "inreach" to staff and departments across campus with a Green Office Program, supporting and celebrating their work to champion sustainability efforts.
- Develop criteria for Green Office designation related to recycling, waste diversion, energy, purchasing, transportation.
- Launch program, recruit & support Green Office participants.

#### *Explore creation of a Campus Green Fund to support student- and/or staff-led sustainability projects*

- Survey other schools' programs to begin to imagine possible frameworks, policies and practices.
- Assess demand/interest at UC for such a program.
- Explore possible funding sources.

#### *Enhance sustainability efforts at campus events*

- Create a Green Check List for event/meeting hosts to reference when hosting an event/meeting.
- Develop protocol for offering recycling, water jugs, etc. at special events/meetings on campus.

# Engaging the Greater Cincinnati Community

In order to be meaningful, UC's sustainability efforts must extend beyond the physical borders of campus—and they do. As a community pillar, UC takes this responsibility quite seriously, and seeks to engage and support partners from across the city, state and region in their efforts to create a more ecologically, economically and socially vibrant place.

## University Impact Area Solutions Study (UIASS)

One key effort, the University Impact Area Solutions Study (UIASS), is a partnership between the University, local neighborhood associations, the City of Cincinnati, and other stakeholders. The UIASS lays out goals aimed at preserving the unique character of the diverse neighborhoods surrounding the University of Cincinnati, while at the same time improving the University's relationship with the neighboring communities. A range of offices and organizations at UC are working methodically to address concerns illustrated by the UIASS.

For example, recognizing that safety, wellness, and community are integral elements of sustainability, the Office of Sustainability organized a co-curricular *Living in the Neighborhood* series of talks in the fall of 2017 and 2018. The series involved the Center for Community Engagement, Department of Public Safety, and the Student Wellness Center, and revolved around the question of: *what does it truly mean to be a good neighbor and member of your community, as a student living off campus?* The vision of the series was to provide students with the opportunity to learn how they can make their time at UC as positive and meaningful as possible, through enhancing the Uptown Cincinnati community and contributing to creation of more livable, just, and robust neighborhoods. Students who attended the talks received service hours.

The UIASS raised quality-of-life issues related to waste and blight in the neighborhoods. In response, a variety of campus organizations have facilitated the following initiatives:

- In 2018, the Center for Community Engagement at UC collaborated with the City of Cincinnati's Neighborhood Enhancement Program and the neighborhood of Avondale to provide yearlong beautification and community revitalization support in Avondale.
- Clean Up Cincy, a student-led beautification organization, facilitates clean up events throughout the year, working with local community councils to integrate efforts to make Cincinnati a better place to live, work, and play.
- *UC Serves* has deployed UC staff volunteers throughout the city on a variety of different beautification projects as part of its annual event.

Another significant concern brought to light by the UIASS was related to connectivity, parking, and issues of congestion in the neighborhoods surrounding the University. To address these concerns, UC has continued to expand its ecology of transportation alternatives outside of the personal automobile to encourage students, staff, and faculty to choose alternative transportation modes (i.e. walking or biking) as ways to get from "point A" to "point B" while supporting healthy lifestyles and building community.

the green partnership
FOR GREATER CINCINNATI

## Regional Multi-sectoral Collaborations

Broader efforts to collaborate around sustainability are ongoing as well. One of these, launched in 2008, is the Green Partnership for Greater Cincinnati (GPGC). A longstanding collaboration between six major regional institutions (City of Cincinnati, Hamilton County, Cincinnati Public Schools, University of Cincinnati, Duke Energy, and Cincinnati State College), the GPGC's goal is to encourage and support efforts that will measurably improve environmental performance, save money for the GPGC partners, and lead to changes in both public policy and personal behaviors.

Another such effort is Green Umbrella, Cincinnati's regional sustainability alliance. Green Umbrella "facilitates collaboration among over 200 area non-profits,

businesses, educational institutions and governmental entities." It was founded primarily as a conservation organization (named the "Regional Green Space Initiative") in 1998, and in 2011 became the regional sustainability network that it is today, with a variety of action teams related to different environmental issues. UC has been quite active in the Transportation Action team, on which the University's Sustainability Coordinator sits. Given that student and employee commuting to and from campus has a significant local sustainability impact, this collaboration is mutually beneficial—for example, as when in August 2018 the University hosted the Green Umbrella's *Regional Trails Summit*.

Green Umbrella
REGIONAL SUSTAINABILITY ALLIANCE

## Coordinated Climate Action Planning

In 2018, the City of Cincinnati created its new *Green Cincinnati Plan*, providing a comprehensive guide for how the City will work to mitigate climate change. The City's Office of Environment and Sustainability (OES) and UC's Office of Sustainability met to discuss ways that cross-pollination and linkages between their respective climate action plans could best be realized. Many topical connections were identified, including the following: *(for complete matrix see Table 1)*

- The Built Environment: LEED certification of buildings, energy efficiency investments, and potential for increasing density and forming an "EcoDistrict"
- Education and Outreach: Creation of Green Fund/s, enhanced branding and communication efforts, and collaboration with the Cincinnati Public Schools
- Energy: Building benchmarking, and aggregation to support clean energy purchases
- Food: Efforts to reduce food waste, increase urban agriculture, enhance food security, and improve awareness of sustainable procurement practices and dietary choices
- Natural Systems: Increasing tree canopy and access to green space, undertaking biodiversity assessments, reducing grassy areas that require intensive mowing, and utilizing green infrastructure to improve stormwater management
- Resilience: Conducting urban heat island assessments, improving communication systems and efforts for diverse populations, and providing places of shelter/refuge for those displaced by climate events

## COMMUNITY ENGAGEMENT PRIORITIES / NEXT STEPS

### Enhance sustainability-related collaboration between the University and other community anchor institutions, and improve community relations

***Implement the University Impact Area Solutions Study***

- Host events and programs that engage community members and educate students on community concerns with the University.

***Integrate sustainability agenda with Next Lives Here.***

- Work with more Cincinnati Public Schools (e.g., LEAP Academy and Hughes High School).

***Grow collaborations on Climate Action and Resilience Planning with the City***

- See Table 1 for a complete list of action items across the topic areas identified (i.e. Buildings, Energy, Food, Waste, Transportation, Natural Systems, Outreach).

- Transportation: Promoting electric vehicles, increasing fleet efficiency, improving bus and bike systems, and increasing connectivity

- Waste: Diversion and recycling education and infrastructure

Additionally, the UC Environmental Studies department's Senior Capstone class worked with the City to provide recommendations for the *Green Cincinnati Plan*. Through this collaboration, students were able to learn hands-on planning skills that result in real life solutions, while the City gained additional research capacity and local input. These mutually beneficial collaborations create opportunities to enhance the quality of life in Cincinnati now and in the future.

## Conclusion

As institutions of higher education serve as catalysts for the dissemination and proliferation of ideas and paradigms, the willingness of the institution to adopt sustainable policies and programs is essential. Likewise, in order to achieve a sustainable university, individuals must embrace sustainable, regenerative behaviors that in turn shape the culture of the institution. The outcome of the ebb and flow between the institutional influence and the choices of the individual community members is what creates a campus' cultural identity.

It is UC's goal that, through empowering and educating individuals, and leveraging the scale of institutional practices, it creates a culture of sustainability that is proactive in showcasing solutions in the face of the most pressing, intractable issues of our time.

| | Topics | City of Cincinnati | University of Cincinnati |
|---|---|---|---|
| The Built Environment | United States Green Building Council (USGBC) LEED Standards | Require all new City facilities to be LEED Silver certified or better. | Require all major construction projects and renovations to be at least LEED certified, by ideally LEED Gold. |
| | Energy Efficiency | Improve City Facilities by investing in energy efficiency - specifically HVAC and lighting. | Improve University facilities by continuing to invest in LED lighting and HVAC. |
| | Population Density | Encourage population density and transit-oriented development in appropriate locations through zoning and incentives. | Supports population density in on campus and off campus projects through community development initiatives. |
| | Sustainability District | Create a "Sustainability District". | UC is a leading institution in the Uptown section of the district. |
| Education and Outreach | Green Fund | Create a "Green Cincinnati Fund" to finance sustainability initiatives. | Work to develop a Green Revolving Fund/ Sustainability Fund. |
| | City - University Partnership | City-University-Corporate Partnership for Education and Training. | UC Environmental Studies Program. |
| | Branding and Communications | Create branding and communication strategy for Cincinnati sustainability efforts. | Continue to enhance the influence of the branded UC \| Sustainability across the institution. |
| | Cincinnati Public Schools | Expand environmental education and experiences for CPS students and others. | Continue to participate in the Hughes HS Green STEM events. |

**Table 1**

| | Topics | City of Cincinnati | University of Cincinnati |
|---|---|---|---|
| Energy | Energy Benchmarking | Implement mandatory energy benchmarking ordinance. | Implement energy dashboards in facilities across campus, starting with residence halls. |
| | Energy Aggregation | | Explore the feasibility of solar energy on branch campuses if the City adopts energy aggregation. |
| Food | Food Waste | Encourage individuals and companies to prevent, recover, and recycle wasted food. | Continue to utilize the *Leanpath* food waste software in campus dining halls, continue to research the feasibility of anaerobic digestion, and expand UC's coffee ground composting program. |
| | Dietary Choices | Promote understanding of the impact of dietary choices and benefits of a plant based diet. | Revitalize and expand "meat less Mondays" in campus dining facilities. |
| | Urban Agriculture | Create policies and support programs that encourage urban agriculture. | Continue to incorporate edible, multi-functional vegetation into the campus landscape. |
| | Food Security | Support strategies for ensuring food security in ALL communities throughout Cincinnati. | Expand the utilization and influence of the *Bearcat Food Pantry*. |
| | Purchasing | Encourage purchasing of healthy, sustainable foods by major institutions. | Continuing working with UC Food Services to provide sustainable, regionally sourced food. |

| | Topics | City of Cincinnati | University of Cincinnati |
|---|---|---|---|
| Natural | Tree Canopy and Access to Greenspace | Increase city-wide tree canopy coverage to at least 40%, and ensure all residential neighborhoods to 30% tree canopy coverage. | Ensure that UC has at least a 30% tree canopy coverage. |
| | Grass Spaces | Decrease the acreage of mowed grass and replace with bushes and trees. | Reduce the amount of mowed grass spaces through shrubs, bushes, and trees. |
| | Stormwater Management | Increase the amount of storm water holding capacity using green infrastructure and natural systems. | Increase the amount of storm water holding capacity using green infrastructure and natural systems. |
| | Biodiversity | Conduct biodiversity assessment for Cincinnati. | Conduct a campus wide biodiversity assessment. |
| Resilience | Communication | Develop multilingual communication network for disseminating risks and recommendations in the event of emergency (e.g. Rave Alert). | Work to enhance the effectiveness of communication efforts in the event of emergency. |
| | Shelter and Security | Climate Haven - Prepare Cincinnati to receive climate refugees. | Prepare the University to be a place of shelter during extreme emergencies. |
| | Urban Heat Island Assessment | Conduct an Urban Heat Island Assessment. | Conduct an Urban Heat Island Assessment. |

| | Topics | City of Cincinnati | University of Cincinnati |
|---|---|---|---|
| Transportation | Electric Vehicles | Encourage the use of electric vehicles through City programs that incentivize EV ownership and infrastructure. | Expand and increase the amount of EV charging stations. |
| | Green the Fleet | Green the Fleet: Improve the fuel efficiency of the City's Fleet. | Work to expand the efficiency of the University's vehicles by purchasing hybrid and electric vehicles. |
| | Bus Usage | Encourage corporate sponsorship of transit passes and infrastructure to encourage employee bus and bikeshare ridership. | Continue to provide UC students, staff, and faculty with the UC / Metro EZ Ride program, to encourage bus usage. |
| | Connectivity | Increase connectivity and cohesion within multimodal transportation options. | |
| | Bike Infrastructure | Implement and update 2010 Cincinnati Bike Plan and Cincinnati Riding or Walking Network (CROWN) Plan. | Continue to work to help make the Uptown connector element of CROWN a reality. |
| Waste | Waste Diversion | Improve recycling and waste reduction in City facilities. | Improve recycling and waste reduction across UC's campus, building by building. |
| | Recycling in Public Spaces | Install public recycling receptacles in neighborhood business districts. | Work to install recycling bins on the perimeters of UC's campus. |

# Chapter 3 Operationalizing Sustainability

## Operationalizing Sustainability- Campus Infrastructure, Policies and Initiatives

*There is no such thing as 'away'. When we throw anything away it must go somewhere.*

– Annie Leonard
Proponent of
Sustainability

The University of Cincinnati (UC), like any large research university, functions as a small city, with buildings and landscapes that must be maintained, resources and materials constantly flowing through campus, and a large population utilizing services such as energy, housing, dining and transportation. This large scale cuts both ways: it means that UC is responsible for a significant environmental "footprint"—but also has an opportunity to be a powerful force for, and model of, sustainability solutions and innovations.

To that end, the University works to incorporate sustainability into the design, operation, and maintenance of its buildings, landscapes, and overall campus operations. The following is a review of UC's current successes, challenges and goals regarding all major operational components of campus: building design, construction and maintenance; landscape management; water and energy supplies and management; transportation; food and dining; purchasing; and waste reduction and diversion.

1819 Innovation Hub, University of Cincinnati
*LEED Silver*

Teachers College Renovation Ph1 & 2, University of Cincinnati
*LEED Certified and LEED Silver*

## Buildings

The physical structures of the places in which one lives, works, and plays influences how the world is constructed and experienced. Ideally, these structures will maintain and support natural systems, foster learning, and create a sense of place. As home to one of the preeminent Design and Architecture programs in the nation, UC strives to meet that ideal—a commitment embodied in when it became one of the first campuses in the nation to adopt a robust Sustainable Design Policy for new buildings, in 2001.

## Designing to LEED Standards

The University of Cincinnati requires new construction or renovation projects to align with LEED Silver standards or better. Currently, the university has twelve LEED-certified buildings (12.4% of the total built space on campus), and is in the process of renovating and constructing others to meet LEED certifications. While numerous other campuses have policies that endorse LEED "equivalency" rather than actual certification, UC holds itself accountable and maintains transparent adherence to this important commitment by undertaking the independent third-party review and thorough documentation required to have its projects certified—as demonstrated on its website. At the university, LEED is an important tool for creating buildings that have lower construction impacts, are more resource-efficient to operate, and provide more healthy, pleasant spaces for occupants.

**CONSTRUCTION WASTE DIVERSION**

| Building | Total Waste Tonnage | Total Diverted Tonnage | % Diverted Material | Year Completed |
|---|---|---|---|---|
| Morgens Hall | 1,613.50 | 1,269.90 | 78.70 | 2013 |
| Nippert Stadium Renovation | 3,516.45 | 3,049.94 | 86.73 | 2015 |
| Medical Sciences Building (MSB) | 6,376.09 | 4,435.09 | 69.56 | 2016 |
| Scioto Hall | 2,038.91 | 1,676.66 | 82.20 | 2016 |
| Teachers-Dyer Complex | 4,846.10 | 4,627.40 | 95.50 | 2016 |
| **Totals** | **16,777.55** | **13,789.09** | **81.88%** | |

## Minimizing Waste in Construction and Renovation Projects

One key criterion associated with LEED is construction waste diversion—that is, the degree to which building materials from construction are kept out of the landfill through recycling or re-use. LEED goals range from 50-75% diversion, depending on the level of certification sought. UC's overall construction and demolition waste diversion rate for projects between 2013 and 2018 was an impressive 81.8%, with one project achieving a diversion rate of over 90%. In terms of overall waste generation, however, major construction projects over the past five years created an average of 51 pounds of waste for each of the 655,672 square feet added; this is much higher than the USGBC's ideal benchmark of 2.5 pounds or less per square foot added—something UC can continue to work on with its contractors.

**DIVERTED WASTE MATERIALS**

| Material | Pounds | Tons |
|---|---|---|
| IT Recycling | 53,683 | 26.84 |
| Metals/De-manufactured Recycling | 246,380 | 123.19 |
| Departmental Re-use | 63,830 | 31.92 |
| Public Sales+Auctions | 184,475 | 92.24 |
| Trash | 122,400 | 61.20 |
| **Totals** | **670,768** | **6,394.18** |

When renovation and construction projects occur, many interior furnishings and infrastructure gets displaced, and need to be properly reused, recycled, repurposed, or scrapped. The Surplus Management Department serves the University community in all matters relating to the proper handling of campus materials throughout their life-cycles, ensuring maximum "re-use" of materials when feasible, and sustainable end-of-life treatment if not.

## Managing Space Sustainably and Efficiently

UC has well-established protocols for managing its buildings sustainably. Its Green Housekeeping policy has been in place since 2009 and includes training and engagement of housekeeping staff and building occupants, as well as a commitment to purchasing environmentally-preferable products. Its Indoor Air Quality policy ensures healthy buildings across campus. Also, a robust energy and water benchmarking programs ensure that the buildings are run efficiently.

Another important aspect of sustainability pertains to space utilization. Analyses of higher education as an industry have pointed out that the level of campus growth across the US is unsustainable, resulting as it does in bloated maintenance and operational budgets. Hence the mantra, gaining ground in the field: "The greenest building is the one you don't build." Thinking creatively and strategically about space utilization has the potential to help campuses like UC reduce operational loads and costs and also to avoid unnecessary growth.

*Above: Construction from LEED site*

## BUILDING PRIORITIES / NEXT STEPS

### Provide a healthy, environmentally-friendly and productive built environment for UC students, faculty and staff

#### *Build on the success of UC LEED Buildings*

- As new buildings are designed and constructed, continue to make use of the USGBC's LEED certification criteria, while striving for Silver or Gold.
- As buildings are renovated, continue to make use of the USGBC's LEED certification criteria, while striving for Silver or Gold.
- Work with contractors to reduce the amount of waste generated in construction and demolition projects.

#### *Conserve resources through strategic space utilization*

- Strategically schedule night/weekend classes to allow certain buildings to be shut down for periods of the day/weekends.

#### *Cincinnati 2030 District*

- After joining the Cincinnati 2030 District in early spring 2019, continue to work with the organization to reduce building energy use, water consumption, and transportation emissions by 50% by the year 2030.

## Landscape

Sustainable landscape design begins with an understanding of the intended use of a site and includes function, maintenance, ecological compatibility, cost effectiveness, accessibility and aesthetics. A sustainable landscape creates a positive connection between humans and nature by working with, rather than against, natural systems while also serving as a place for social interaction, reflection, and intellectual stimulation.

UC Garden

### Understanding and Valuing Natural Systems on Campus

UC's guiding values and principles in relation to its landscape can be found in the 2014 Landscape Guide, which explicitly calls out sustainability as a foundational principle in UC's landscape management, and specifies the use of design and management practices that promote biodiversity, conserve resources, prevent pollution, utilize environmentally preferable materials when possible, and promote education and awareness-raising amongst members of the campus community.

One aspect of "valuing" the campus landscape is the need to understand the various systems in play, as well as the ecosystem services provided, and the resulting overall biodiversity assets and challenges. UC has not yet undertaken such a comprehensive systems analysis. It has inventoried and monitored species found in the Harris M. Benedict Botanical Preserve (Hazelwood), and incorporated inventory and analysis of the many rare, endangered and native species found there into the curricula of the College of Arts and Sciences. Given the already-evident and increasing impacts of climate change, as well as ongoing development, there is now a need to expand this level of inventory and monitoring to the rest of campus (see Chapter 5 regarding climate preparedness.)


## Pollution Prevention

The University's current prescriptive approach to snow and ice removal is one important way in which it minimizes the harmful effects of salt on the campus's built environment, its landscapes, and adjacent streams and habitats. Salting sidewalks and roadways is necessary throughout snowy, icy winters, to provide safe vehicle and pedestrian access to campus spaces. However, applying salt increases salinity levels, leading to soil contamination, poor water quality, a reduction in biodiversity, and erosion of nutrient rich topsoil. The corrosive nature of salt also deteriorates sidewalks, buildings, and site furnishings at an accelerated rate. UC's approach to snow and ice removal reduces the quantity of salt application required, by focusing on primary and secondary pathways (Tertiary ways, those sidewalks and steps less traveled, remain snow- covered). This site-specific approach also allows the University to identify micro-climates and opportunities for alternative de-icing elements.

Application of fertilizers and pesticides is undertaken in accordance with Integrated Pest Management, which is a decision-making framework that incorporates cultural, mechanical and biological interventions in addition to chemical ones, thus providing alternatives and minimizing chemical pesticide and fertilizer applications.

Reducing the need for chemical usage can also be accomplished by reducing and/or limiting the area of campus that require "intensive" maintenance. This also has the potential benefit of reducing the area that needs to be mowed or otherwise groomed—saving labor and equipment, reducing noise pollution, and reducing costs.

## Learning with the Landscape

The UC Soiled Hands Learning Garden is an experimental and educational sustainable agriculture site located near the Uptown campus. The Office of Sustainability has adopted a holistic, systems-based approach to the design, maintenance, and utility of the space, which features companion planting, a variety of bio-regionally appropriate edible perennials, "pollinator pockets," and rainwater harvesting from the tool shed. There are educational workshops, community building work days, and environmental education for children at the adjacent Early Childhood Learning Center in the space; participants learn about plant identification, composting, ecology, and where food comes from. Currently, the Office has donated the harvest from the site to the Bearcat Food pantry, which provides food and resources for free to students experiencing food insecurity.

## LANDSCAPE PRIORITIES / NEXT STEPS

### Protect and enhance campus ecosystems, look for opportunities to increase multi-functional landscapes and utilize maintenance practices that work with nature

#### *Assess strengths, weaknesses, and opportunities related to natural systems and landscape management on campus*

- Analyze the relationships of several campus-wide systems such as campus stormwater, hardscapes, lighting, lawn areas, transportation systems, etc.
- Inventory campus trees, focusing on overall health and quantity of species.
- Incorporate a tree diversification and reforestation program based on the results of existing tree inventory to combat against future insect and disease issues and improve biodiversity.

#### *Minimize high maintenance lawn areas*

- Analyze the usage and maintenance practices for the existing turf areas on campus.
- Reduce the "high maintenance" areas by (3)% in favor of "low maintenance" areas that require one or two maintenance mowing per year.

#### *Reduce Toxins*

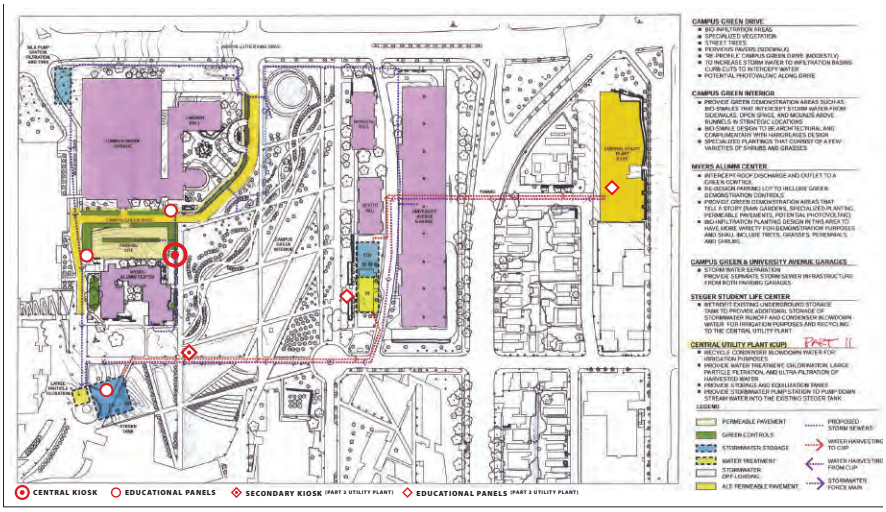
- Continue to minimize pesticide and herbicide usage across campus utilizing treatment programs that are more sustainable and/or organic.

#### *Increase pollinators attracted to designated campus areas*

- Participate in the Zoo's program on landscapes to attract pollinators and measure the results. Phased areas for consideration: Victory Parkway and Fishwick. If successful, UC Blue Ash and UC Clermont would be second phases.

## Water

Water is an integral and iconic part of life in Cincinnati, founded at the confluence of two rivers and developed in large part thanks to the opportunities afforded thereby. While adequate water supply is not generally an issue, water quality and potential for flooding are two areas of ongoing concern—with the growing impacts of climate change adding a degree of urgency (see Chapter 5). UC is contributing its considerable research and technical expertise to regional water issues with its creation of the Great Miami Ground Water Observatory and was recognized by the Association for the Advancement of Sustainability in Higher Education's (AASHE) 2017 Sustainable Campus Index as the top institutional performer in dealing with water.




## Water Conservation

UC's water conservation efforts are significant and ongoing. Data from its most recent AASHE STARS report indicates the University reduced its per capita water use by 45% between 2009 and 2016, thanks to a variety of efforts: using efficient fixtures, educating building occupants and maintenance staff, capturing rainwater for irrigation purposes, and reusing chilled water in campus energy infrastructure. The University continues to see water efficiency and re-use as an area of opportunity.

*Above: Stormwater planning materials for the University of Cincinnati Uptown West Campus.*

## Stormwater Management

Combined Sewer Overflow (CSO) events, where stormwater and sewage overburden a municipal sewer system resulting in discharges to natural waterways, are commonplace in Cincinnati, as is the case in many older cities in the United States that feature outdated sewer systems. The output of sewage into natural waterways results in an enormous amount of pollution that negatively affects environmental, human, and economic wellbeing.

To provide a guiding framework for dealing with stormwater on campus, UC has developed a Stormwater Master Plan, which looks at opportunities for how to utilize green and gray infrastructure to reduce the possibility of combined sewer overflow (CSO) events. In the future, UC may explore working with community partners to develop "district" plans looking at the two primary areas where there are consistent CSO issues that include UC's campus.

One key strategy for reducing stormwater run-off is through the incorporation of green roofs in appropriate locations on campus. Green roofs are multi-functional as they reduce the urban heat island effect, provide habitat, enhance biodiversity, reduce heating and cooling costs of buildings, and add aesthetic and rejuvenating qualities. Currently, the University has green roofs on the DAA addition of the DAAP complex, on Procter Hall, and also has the Zimmer Roof Garden that functions as a green roof. The new College of Business, which is currently being constructed, will feature an intensive green roof.

## WATER PRIORITIES / NEXT STEPS

### Prioritize strategies to protect water supply and water quality for the campus and broader community, due to water-related climate change impacts.

***Continue on campus-wide water conservation strategies***

- Continue/expand harvesting rain water for irrigation.
- Explore more opportunities to use chilled water to regulate building temperatures.

***Implement elements of stormwater master plan***

- Continue to store water in retention basins and control its release, to reduce the possibility of combined sewer overflow events.
- Increase the amount of pervious surfaces throughout the built environment (i.e. pervious pavements or green space).
- Incorporate more green infrastructure into the campus landscape (e.g. rain gardens, bioswales, etc).

***Explore opportunities for "district" planning with the City and other partners to reduce CSO runoff***

- "District 1" opportunity: a conversation with EPA, Burnet Woods, Tri Health, MLK corridor, city garage on Central Parkway to Central Parkway and UC.
- "District 2" opportunity: a conversation with VA, Childrens, UC Health, the Zoo, the Vine Street corridor to Mitchell Avenue and UC.

*Above: Inside the Central Utility Plant*

*Next page: Exterior view of the UC Central Utility Plant*

## Energy

An accessible, consistent energy supply is a pillar of sustainable development; it is the driver of modern economies and societies. Global energy production systems also, unfortunately, create land, water and air pollution and are the principle driver of man-made climate change. This is manifest by the extraction and consumption of fossil fuel resources in the form of coal, oil and natural gas throughout the world, and their emissions.

At the University level, energy supports the campus primary functions with heating, cooling, lighting, and power for the buildings, and fuel for UC transportation needs. The sources of this energy are electricity from the regional power grid; "unitary" sources of fuel used in outlying buildings and individual vehicles; and central sources of electricity, heat and cooling provided by the University's two utility plants that serve the Uptown Campus and surrounding hospitals.

Continual technological evolution offers opportunities for energy production and utilization approaches that are ever-more efficient and reliable. As the central sources of GHG emissions on UC's campus, supply-side energy generation and demand-side distribution and consumption of energy in the University's buildings together hold one of the best opportunities for minimizing UC's footprint and costs. As a major research institution and a major energy consumer, UC is clear-eyed about the need to support such innovation; its energy team works tirelessly and creatively to strike a balanced approach to campus energy that minimizes campus environmental impact while providing economic value.

## Supply-side Power Generation

UC has generated much of its own utilities for many years from a central plant, with boilers and steam turbines with coal as the only fuel.

In the 1960's and 1970's, air conditioning was installed throughout the campus, it was supplied from a central chiller plant. Several oil boilers where installed for peak steam loads.

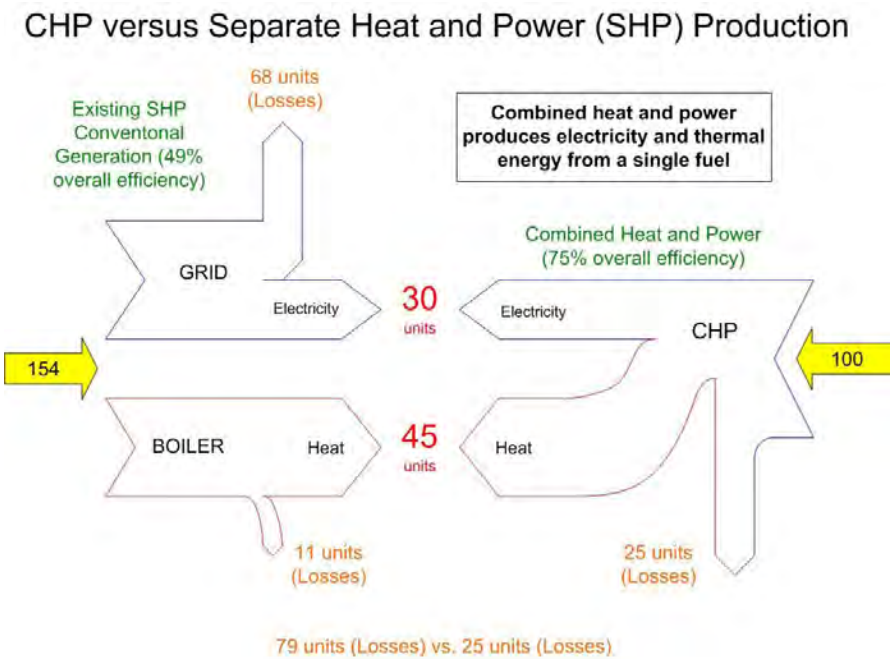
In the 1980's and 1990's, the Central Plant and other infrastructure was constructed for steam generation. Steam, chilled water and electric distribution for two campuses were interconnected.

Chilled water storage was installed to offset peak electric loads. Natural gas was piped to the east and central plants. At that point; coal was used for base loads and natural gas was used for peak steam and electric loads.

In the 2004 the west campus chillers were moved to the Central Utility Plant to make room for the construction of MainStreet.

Natural gas combustion turbine generators were installed for electric generation with waste heat boilers for steam production. The steam could be used by the building or used by a steam turbine generator for peak electric loads.

In 2010 UC installed a 138,000 v electric substation, enabling 50% of UC's electric to be made from natural gas fired turbines, rather than being purchased from a coal based utility company. Coal was also replaced with steam from UC's waste heat steam generators.




In 2009 and 2010, the Combined Heat and Power Certification of Greenhouse Gas Reduction by the EPA for efficient operation of the cogeneration plant was awarded to the Utility Department.

The benefit of combined heat and power systems like UC's is that they provide much more clean and efficient power than power from large utilities. The following figure illustrates the benefits of combined heat and power systems.

Making changes to power supply infrastructure is capital intensive and often requires long planning horizons. On the "plus" side, this capital intensity means that the generation and distribution of power is directly tied to cost, which means that a reduction of its usage can also save money. UC's energy strategies and its power generation facilities are overseen by UC's Utilities Department.

Many production improvement projects have been implemented to increase efficiency and reduce the amount of fuel consumed by the UC plant: for example, installation of variable frequency drives on boiler combustion fans, a back-pressure steam turbine, a new ash handling system, heat exchangers to reduce energy consumption through city water cooling, and piping modifications to reduce pump horsepower.

## Clean Energy Options

Over the last decade, many colleges and universities throughout the country have adopted renewable energy into their energy portfolios. Renewable opportunities are very location dependent. They include: solar PV, solar hot water heating, geothermal, wind power, microwind and biomass. Many of these technologies can be inserted directly into the context of the campus as smaller scale installations. Or alternatively, built at large in partnership with local utilities or energy service providers.

Every year, alternative and renewable fuels become more cost-competitive and the technologies get better. Universities will continue to evaluate systems that provide the best value for them, the reliability and efficiency of a district system, central plant CHIP (combined, heat, chilled water and electric plant) and/or the flexibility of unitary or building systems, while looking at option to purchase electric from the grid.

At UC, the approach to energy supply is under constant review, as the potential for individual build solar arrays, geothermal systems, condensing boilers and other systems are periodically being evaluated, according to the following criteria:

1) Reliability: For base loads and demand variation (i.e. peak, stand-by), from water and steam ranging from (-25°F to 100°F), to power.

2) Cost: Includes "first cost" (i.e. capital investment needs) for base load, peak load and stand-by, and the potential for building load reduction (i.e., building efficiency improvements); and includes operating cost or cost energy.

Weighing all of these factors, alongside environmental impact, UC has made significant progress in "greening" its energy supply. For example, over the past decade, the University has completely phased out the use of coal as a fuel on campus—a decision that is great for the campus carbon footprint and for overall campus sustainability. Currently the university is also weighing the possibility of purchasing wind power for buildings that aren't part of the Uptown campus cogeneration system. As cost-effective, reliable energy supply options become more and more available, UC will continue to evaluate them, and adopt them if and as they meet the triple bottom line of (life-cycle) cost-effectiveness, environmental benefit and reliability.

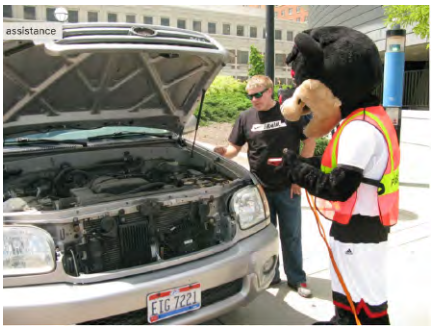


*Above: Equipment installed in the new Lindner Hall, on target for a Gold LEED designation in 2019.*

## Demand-side Energy Conservation & Efficiency

As on the supply side, UC staff have spent many years upgrading existing buildings with more efficient technologies, while building its newest buildings with highly efficient designs. Some of these improvements have included: lighting upgrades, HVAC improvements, occupancy and building controls, installation of variable speed drives on fan and pump motors, thermal envelope upgrades and the purchase of more efficient plug load devices all throughout the campus. These types of conservation and energy efficiency projects represent the most cost-effective projects that are easy to implement and can give UC momentum on the path to sustainability.

Delivery of electricity, steam and chilled water from the central plants takes place through an extensive and complex network of underground service tunnels, underground conduits and overhead lines. These networks supply the campus buildings, outdoor lighting and essential equipment. Initiatives to reduce the amount of energy used to distribute steam and electricity on campus have included installing over 1,000 insulation blankets on steam valves in all campus buildings, improvements to the chilled water distribution, steam line loss, transformers and control upgrades. These improvements involve collaboration among multiple departments across campus.


*Above: EV charging stations*

## Fleet Vehicles & Electric Vehicle Infrastructure

Currently, the University of Cincinnati has 276 fleet vehicles including four hybrid Chevy Volts, and one electric GEM. Plans are to continue expanding fleet vehicles with hybrid and electric ones. UC also has four electric vehicle charging stations, which creates the infrastructure that supports and promotes the utilization and popularization of emission free, electric vehicles.

# ENERGY PRIORITIES / NEXT STEPS

## Reduce the demand for, and carbon intensity of, energy on campus to reduce costs, lower greenhouse gas emissions, and increase resilience

### *Encourage an ethos of energy conservation and efficiency for building occupants*

- Build and utilize an energy dashboard for all UC buildings.
- Adjust lights, heaters, AC units, etc. when residence halls and dining halls are closed over breaks.
- Ensure lights are off in dining halls when closed over the weekends.

### *Retrofit existing buildings to improve energy efficiency*

- Continuing to retrofit existing buildings with energy conservation methods, i.e: LED lights, water bottle refill stations, energy recovery systems, occupancy sensors, temperature controlled thermostats, and better insulation.

### *Switch to lower-carbon, renewable building energy sources*

- Invest in new chillers and use chilled water to regulate building temperatures.

### *Transition fleet to be fuel-efficient with less carbon*

- Adopt MPG standards in fleet vehicles purchases, to reduce fossil fuel consumption.
- Study feasibility of installing more EV charging station on campus.
- Procure electric and hybrid fleet vehicles, as existing vehicles get decommissioned.

# Transportation

Since it requires thousands of students, employees and community members to get to and from campus every day, the University works to provide a comprehensive and varied array of multimodal transportation options that are more environmentally, socially, and economically sustainable than the personal, conventional automobile—taking cues from ecosystem ecology, in which diverse natural systems are the strongest and most resilient.

Even with this institutional investment in supporting and promoting varied alternatives, car culture is still prevalent at the University, as elsewhere in the US. This is an ongoing challenge that will require significant innovation—locally, regionally, and nationally.


## Active Transportation: Walking and Biking

The University is analytic of the flows of energy through campus and is committed to ensuring that it is a place for people first. With the opening of the new Lindner College of Business, UC will restrict vehicular traffic throughout the Mainstreet Roundabout, keeping pollution and vehicular exhaust out of campus proper. By rerouting vehicular traffic through Woodside to Campus Green Drive, the University is making a bold statement in its efforts to encourage pedestrian and bicycle activity and healthy lifestyles.

The Bike Kitchen is a free service provided to the community by the Office of Sustainability that offers repair services, tune-ups, and workshops, and community bike rides with local environmental organizations. The Bearcat Bike Share is a free service for students, staff, and faculty that allows individuals to check out bikes for free from the Bike Kitchen for up to a week. Through these programs, UC promotes bicycle culture, safety, and accessibility to promote a sustainable form of transportation that builds community and fosters healthy lifestyles.

In addition, UC is collaborating as part of the Green Umbrella (see chapter 2) on related initiatives, including the Cincinnati Riding or Walking Network (CROWN) project, which is working toward a vision for a 30-mile separated trail loop around Cincinnati's urban core that, when complete, will connect at least 242,000 people in 49 neighborhoods to major destinations (including UC).

*Above: : Sustainability advocate with the Bearcat Bike Share bike fleet*


## Ride and Car-Sharing

The University offers options for individuals affiliated with UC to have the use of a vehicle without necessarily needing to own one. Providing the campus community with the ability to eschew car ownership helps minimize issues related to parking and congestion, while simultaneously reducing UC's carbon footprint.

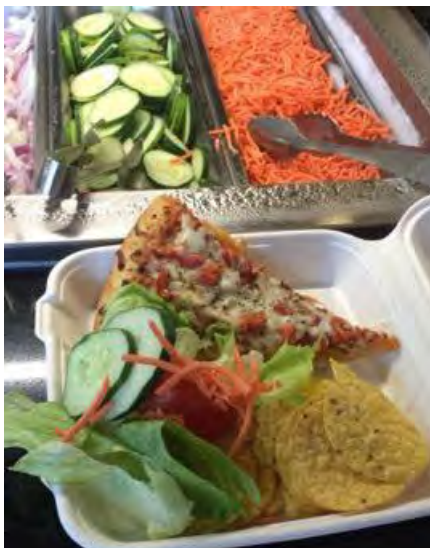
Zipcar is a car sharing service that maintains 24-hour access for students, faculty, and staff to reserve a car by the hour or by the day. ZimRide is an online ride sharing service that connects drivers and passengers heading to the same area—which makes for a great solution for rides for weekend trips, commuters, students visiting home, or to similar destinations. NightRide is a free nighttime on-demand transportation service that provides safe and reliable transportation to and from locations within a one-mile radius around the campus. NightRide has 11 vans operating 8pm - 5am every evening.

## Public Transportation

The UC Shuttle System is a free service offered to students, staff, and faculty within the UC community. Shuttles circulate throughout the neighborhoods of Uptown Cincinnati and to satellite campuses, offering a convenient way to get to and from campus.

For more regional travel, UC*Metro is an agreement between UC and the Southwest Ohio Regional Transit Authority, which operates the region's Metro bus service. An EZ Ride Fare Card is open to students, staff, and faulty, which allows them to take the local bus at a substantial discount. Because this is an important resource, UC hopes to explore deepening this partnership to make these fares free for UC-affiliated individuals.

To support sustainable travel outside of the Cincinnati metro area, UC has collaborated with GoBus, Megabus, and Barons Bus to provide intercity bus transportation options that are affordable, convenient, and reliable, with a bus stop located on campus.



## TRANSPORTATION PRIORITIES / NEXT STEPS

### Increase Multi-Modal Transportation Use

***Expand educational programming on bike safety, maintenance, and riding to increase ridership***

- Continue to promote the *UC Bike Kitchen* and its services, workshops and events.
- Continue to promote the campus *Bearcat Bike Share.*

***Update the UC Bike Plan***

- Accomodate more bikes on campus by increasing the zones specified for bicycles and pedestrians and adding bike racks.
- Connect UC's bike infrastructure, with regional partners such as the Cincinnati Riding or Walking Network (CROWN) and the City of Cincinnati's *Green Cincinnati Plan*.

***Enhance the usage and impact of existing sustainable transportation options on and off-campus***

- Promote Zimride, Zipcar, the UC Shuttle system, EV Charging stations and Nightride through face-to-face outreach, tabling, social media, and targeting students at orientation.
- Expand the UC*Metro program, and increasing the collaboration with Metro to provide cheaper or free opportunity for UC community to use Metro services.

## Food and Dining

UC has partnered with Aramark to provide food and hospitality services. University Food and Housing Services offers food services through 23 locations across campus which includes nationally-branded franchises, four residential dining halls and three catering locations, as well as supplying food services for sporting events at Nippert Stadium, Marge Schott Stadium, Gettler Stadium and Fifth Third Arena. Aramark has partnered with the Office of Sustainability to prioritize sustainability efforts and create long term and short-term goals.

*Above left: UC Shuttle picking up students on McMicken Arc.*

## Sustainable Menus

Human health and well-being are directly related to food access and choices—and, since approximately 20-25% of greenhouse gas emissions are driven by global agriculture and associated land use changes, so is the health of ecosystems. Many institutions, including UC, have worked hard to expand the quantity and quality of vegan and vegetarian options available, and to encourage their patrons to make healthier, sustainable choices.

## Reducing Dining-Related Waste

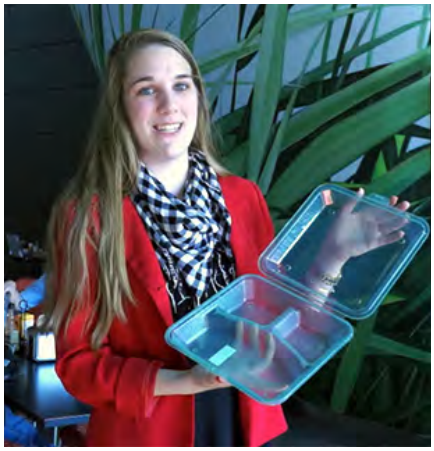
In the United States, approximately 40% of food goes to waste, resulting not only in enormous environmental externalities such as climate change, but also social externalities in that many college students are food insecure. UC went "tray-less" more than a decade ago, as one way to tackle the issue of food waste (when diners don't have trays, they are less likely to take more food than they can eat.)

As a further step toward mitigating food waste, UC Food Services has begun to implement *Leanpath* software to monitor the amount of pre- and post-consumer food waste, and to optimize purchasing and menu planning to reduce waste. Since the launch of *LeanPath* in March 2016, the University has avoided wasting almost 17,000 lbs of food. Additionally, UC Food Services has begun collecting pre- and post-consumer food waste for composting at Market Pointe and On the Green (OTG) dining facilities.

Additional efforts to reduce dining-related waste have focused on recycling used cooking oil, incentivizing re-use of mugs and eliminating unnecessary plastic packaging. A campaign in 2017 accomplished the reduction of over 64,000 plastic bags during the fall semester by eliminating the offering of bags in Catskeller, a grab-and-go dining hall on campus, and they have since been eliminated in other locations as well. Single use plastics are a huge global problem and reducing their use is an important priority.

*Above left: Classicfare catering*
*Above right: Chef preparing food in one of UC's dining halls*

*Next page top left: Student with reusable to-go container*
*Next page top right: Students in dining hall*



## Sustainably-Sourced Product Offerings

Many product designations and criteria exist to help consumers learn more about the degree to which their food is produced in ways that benefit local producers and entrepreneurs; are ecologically sound; include humane treatment of animals and ensure fair treatment of workers. UC's Food Services procures a number of items designated as organic, fair-trade, GMO-free, local, or have some other sustainability aspect. These include fair trade coffee in the cafés, cage-free requirements for eggs, Monterey Bay Aquarium Seafood Watch certified seafood, and local produce when feasible. Locally-sourced suppliers makes up 60% of Aramark's food purchases. These include Sara Lee, Great Lakes Cheese, T. Marzetti Company, Kahn's, Glier's, Cargill, Brandt Meats, Hillshire Farms, Servatii, Buskens Klosterman's, Reiter Dairy, John Morrell & Co., JTM, Hubert Supply Co and Ohio Proud Produce.

# FOOD PRIORITIES / NEXT STEPS

## Increase Sustainability of Campus Food Systems

### *Expand the amount of food sourced sustainably*

- Work to quantify, measure, and track food that is USDA Certified-Organic, and use that data to set goals for increase.
- Work to quantify, measure, and track food that is Fair Trade certified-Organic, and use that data to set goals for increasing the amount of food that meets equitable labor and trade standards.
- Work to quantify, measure, and track the amount of food procured from within a 250 mile radius so that we can set goals on increasing the amount of food coming from within this "local zone".
- Establish and maintain 65% sustainable purchasing at OTG dining center (150 food miles or organic).

### *Reduce Food Waste*

- Expand the Leanpath foodwaste software throughout all dining halls to calculate the amount of pre- and post-consumer food waste.
- Expand composting services to dining halls outside of Market Pointe and OTG.
- Begin transitioning/utilizing composting capabilities in retail locations by fall 2019 and 100% of retail by fall 2020.


# Purchasing

Every year, the University spends $460 million in goods and services. Each of those purchases is an opportunity for advancing sustainability. UC does make an effort to purchase efficient, environmentally preferable and fair- trade products when it comes to its buildings and landscapes, fleets and food. Recognizing the strides UC has made in the past, the University is also setting goals for the future.

## Procurement Contracts as Tools

Contracts can be a tool for improving sustainability if crafted correctly—but too often they pose obstacles. An example: Game day recycling efforts in Nippert Stadium have been significant (see chapter 3), but current contractual agreements require branded plastic cups at many games, and Rumpke Recycling, the University's waste and recycling hauler, is not able to recycle these cups. One potential solution is to reevaluate contractual agreements when they go up for renewal, with the possibility of using compostable cups or eliminating the use of cups altogether. Similar situations abound across UC (as with all large institutions); the University will continue to identify opportunities to make the contracts work for sustainability.

## "Life-Cycle" Oriented Decision-Making

Purchasing sustainably means considering the entire life-cycle of products, from raw materials to production, distribution to installation, operation to eventual disposal (i.e., "cradle to grave"). It means applying this thinking not only to the item's environmental impact but also the cost, operations, maintenance, and disposal expenses, in addition to the purchase price—even when the department buying the item might not be the same department that will bear the other costs. (Revolving funds, like the one proposed in chapter 2, can be a good tool for facilitating this approach.) UC's capital procurement of heating and water systems are analyzed and selected according to their life-cycle environmental impact; ideally, policies could be instated to require a similar consideration for all purchases. The proposed Green Office program (see chapter 2) could be used to cultivate and strengthen this mindset for campus community members.

## PURCHASING PRIORITIES / NEXT STEPS

### Leverage UC's considerable purchasing power to increase demand for sustainable options within markets

#### *Increase University purchases to meet sustainability criteria*

- Increase purchasing of 90-100 percent post-consumer recycled and/or agricultural residue content and/or FSC recycled label office paper from 4.79% to 25%.
- Require electronics purchased to be EPEAT Silver and ENERGY STAR labeled unless justifiable reason is given.
- Add information to UC's central purchasing website and UC Sustainability's website regarding sustainable purchasing.

#### *Increase Purchasing knowledge of sustainable companies*

- Flag and highlight products that are environmentally preferential to others in UC's internal purchasing system.
- Seek 3rd-party verification of companies such as Sustainable Purchasing Leadership Council (SPLC).
- Explore becoming a Fair Trade University.

#### *Institutionalize sustainable procurement University-wide*

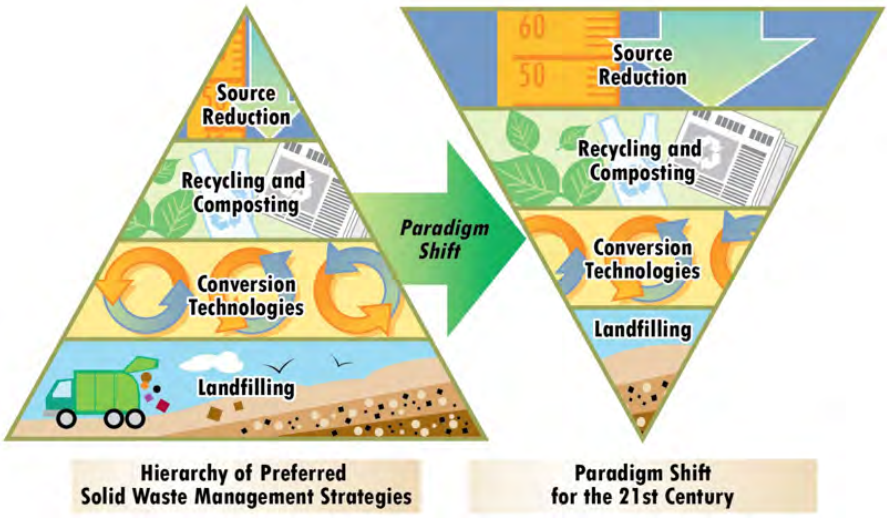
- Increase student education on sustainable procurement through lectures, classes, and programs.
- Educate campus buyers on importance of sustainable procurement.

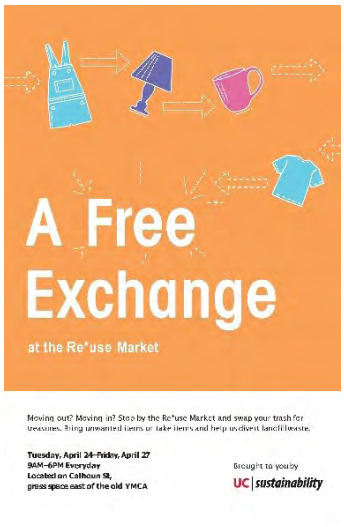

*Above: Dorm Move-Out flyer for donations of unwanted goods.*

## Waste

Avoiding waste is one of the most visible, tangible, intuitive aspects of sustainability. Waste that ends up in a landfill causes the buildup of methane, a powerful greenhouse gas; conversely, cutting consumption and/or reusing or recycling materials lowers the need for resource extraction. This is good for human health, economically efficient—and in some cases, helps local community members by directing donated materials and goods to those in need.

The most fundamental way to approach the problem of waste is by curtailing consumption. The secondary approach to dealing with waste responsibly is through appropriate reuse. Finally, diversion (i.e., recycling or composting) is a critical piece of the puzzle.




## Promoting Waste Reduction and Supporting Re-Use

UC uses varied tools to minimize the unnecessary purchase of goods, including incentive programs, such as those offered by UC Food Services café locations for bringing your own mug; education and outreach campaigns, like those beginning to take place in residence halls on campus focused on empowering and educating first year students, and the proposed Green Office program for staff and faculty (see chapter 2); and systems such as *LeanPath* software (see chapter 3), the Surplus Management system (see chapter 3), and a Green Event Checklist developed by the Office of Sustainability.

During Move–Out, the University partners with local charities to provide convenient receptacles for students living in UC residence halls to donate materials. This program has been successful. However, keeping waste out of the streets when students move out of their off-campus residences during the summer continues to present a perennial challenge.

One strategy to address this issue is the annual Re*Use Market, which provides a central location on campus for students and community members to donate material. Additionally, during the summer of 2018, a partnership was formed between the University, the City, local charities and various community councils in the Uptown area to provide central donations repositories in these neighborhoods during strategic times throughout the summer. Supporting the success of these efforts through widespread promotion, stakeholder collaboration, and education (such as the *Living in the Neighborhood Series*; chapter 2) is an institutional priority.

## Increasing Diversion Rates: Recycling and Composting

In recent years, UC has been working towards increasing the success of campus waste diversion efforts by implementing new linked recycling and landfill stations (i.e., replacing stand-alone receptacles). The goal with these new "waste station" units is to create a language of recycling that is consistent, branded, recognizable, and ergonomic for the campus community. Opportunities for implementing these stations are being undertaken on a building-by-building basis; this is operationally the most manageable approach and allows the cost of the waste station units to be included in budgets for new construction projects and renovations, or to be funded through grants (for example, an EPA Community Development Grant received in 2016).


Bearcat Recycling is the University's program to recycle at special events and athletic games on campus, started in autumn 2007 as 'Tailgate Recycling.' It is facilitated by the Office of Sustainability, whose staff goes through Nippert Stadium collecting recyclables from receptacles, vendors, and the stands, simultaneously educating attendees on the importance of recycling and reducing consumption. The program features a service learning component, as students who are in need of service hours for scholarships are able to volunteer at each game and learn leadership skills, event management, and the importance of reducing the amount of material that ends up in the landfill. Bearcat Recycling is an important tool upon which UC can build; for example, by reducing the quantity of wasteful material served to Stadium patrons (see chapter 3), by continuing to expand the outreach and education it provides via the scoreboards and on bins, and by stationing Sustainability Advocates and volunteers at recycling bins in the stadium to offer point-of-disposal guidance and education.

*Above: on left, old bins in Rieveschl Hall, on right, new ergo cans in Rieveschl Hall*

Each year, around 20,000 unique events take place across the University, from conferences, lectures, meetings, celebrations and workshops. Currently, there is not an effective protocol in place between Conference and Events Services, Facilities Management and the Office of Sustainability to support event-related recycling. Establishing a communication framework for informing the Office of when these events are scheduled would benefit the Office's ability to coordinate recycling efforts.

Campus Move-In and Move-Out are two of the most significant annual events, during which the University works methodically not only to promote re-use as outlined above, but also to divert as much waste from the landfill as possible. At the beginning of the fall semester, the Office of Sustainability partners with Facilities Management, Housing, and Residence Education and Development in "Operation Move-In Recycle" to strategically place additional recycling dumpsters throughout campus, and to enhance educational outreach on the importance of recycling.

Opportunities to enhance Move-In and Move-Out waste diversion efforts will continue to be grounded in a need for enhanced promotion, better coordination, and better communication.


A final aspect of UC's waste diversion efforts relates to composting. Starting in 2015, UC began collecting spent coffee grounds and filters from over seven cafes across campus and taking them to the University's Surplus Management site to be composted with campus yard waste. Once properly broken down, the compost is then brought back to the Uptown campus and is used as soil amendment for annual beds. Recognizing that food waste is also a regional issue in Cincinnati, and that there may be significant value in scaling up its organics management efforts, the University along with a variety of institutional stakeholders in the region have begun researching the feasibility of anaerobic digestion (i.e., industrial composting) that could provide a large-scale solution to local food waste, provide jobs in the area, and harness biogas for the transportation elements of the operation.

Through collaborative research and development, spearheaded by the Green Partnership for Greater Cincinnati, anaerobic digestion could very well be an environmentally, socially and economically viable opportunity for the region.


*Above top: Sustainability Advocates collecting cardboard during Operation Move-In*

*Above: Poster and Graphic for Earth Week*

# WASTE PRIORITIES / NEXT STEPS

## Embrace a campus culture of "zero-waste"

### *Implement recycling and landfill stations, creating a common language of recycling and waste on campus*

- Continue to seek grant funding through the Ohio Environmental Protection Agency (EPA).
- As new buildings are constructed, tie in recycling and trash station costs into the funding for the building.
- As buildings are renovated, tie in recycling and trash station costs into the funding for the building.

### *Increase the amount of material donated and repurposed when students move out of residence halls*

- End of semester "Move Out" donation (Dorms): Work to enhance promotional and educational efforts around partnerships in dorms with local charities.
- End of semester "Move Out" Re*Use Market (Neighborhoods): Work to enhance the effectiveness and promotions of the annual Re*Use Market by having Sustainability Advocates canvass and do face to face outreach, in addition to existing promotional efforts.
- Summer "Move Out:" Taking into account that the majority of students living off campus move out throughout the summer, opportunity lies at the end of July and beginning of August, when many leases end, work to provide central donation, recycling, and repurposing stations throughout the neighborhoods.
- Enhance recycling educational outreach for new students, volunteers and staff during "Move-In", through providing recycling information on move-in traffic maps, wayfinding recycling maps for different residential zones, and meeting with H.O.T. and Helping Hands volunteers.

### *Increase recycling collected from residence halls*

- Implement recycling protocols for each hall including placing recycling bins on each floor of every residence hall, with the end goal of having individual recycling bins in every room on campus.
- Provide additional recycling dumpsters at the beginning of academic year during "Move-In" to divert as much waste from the landfill as possible.

### *Research feasibility of anaerobic digestion for food waste*

- Quantify the amount of food waste being produced by institutions in the Uptown area.

### *Reduce plastic and disposable, single use materials*

- "Champion" waste reduction by encouraging campus community to pledge to stop using single use plastic.
- Use social media, UC News Record and other media outlets to encourage restricting use of plastic bags and bottles.
- Increase number of reusable water bottles.
- Promote the reusable mug incentive program in Express Mart in Tangeman University Center.
- Encourage purchase of the reusable branded Bearcat Tote Bag when shopping at the bookstore.
- Collaborate with faculty and staff in developing a program to recycle gloves from laboratory spaces and food service centers.

### *Reduce the amount of landfill waste at athletic events*

- Host a "Zero Waste" game in Nippert Stadium and 5/3 Arena for upcoming seasons.
- Implement a beverage can recycling program for 5/3 Arena.
- Transition 100% of current grab and go disposable containers to biodegradable (compostable) corn-based containers.
- Transition 100% of Athletic venue services to biodegradable (compostable) draft beer cups.

## Conclusion

The operations of the University play a critical role in not only minimizing the negative impact on the environment, but also in creating a positive impact on the environment through enhancing the health of the land base, the integrity and wellbeing of people and social systems, and the vitality of the economy. There has long been a dominant mantra associated with the paradigm of mainstream environmentalism, that we as humans must reduce our influence on the environment, but in reality, we have the capability to maximize our impact on the environment in the most positive and regenerative ways possible, and it is through creating the institutional framework for doing so that the University can be a force of altruism in the face of the implications of climate change and the global environmental crisis.

# Chapter 4 UC Carbon Footprint

## Climate Action – Understanding and Reducing the UC Carbon Footprint

*Limiting warming to 1.5° is not impossible, but will require unprecedented transitions in all aspects of society.*

- Hoesung Lee, chair of the Intergovernmental Panel on Climate Change

The University of Cincinnati (UC) first responded to calls for climate leadership more than a decade ago, when then-President Nancy Zimpher signed the Carbon Commitment (formerly the American College and University Presidents Climate Commitment or ACUPCC; see chapter 1). Since then, UC has worked consistently and collaboratively to provide such leadership: managing its own emissions, educating students and engaging faculty on the issue, and, most recently coordinating its climate action planning efforts with the City of Cincinnati's (see chapter 2).

As part of the Carbon Commitment, UC agreed to specific action steps, including these:

- Regular updates and public reporting of UC's annual carbon footprint;
- Periodic "climate action plans" that include reduction goals, strategies and targets;
- Infusing climate change into UC's curriculum and educating the campus community about the urgency of the issue and its solutions; and
- Incorporating climate change into UC's research enterprise.

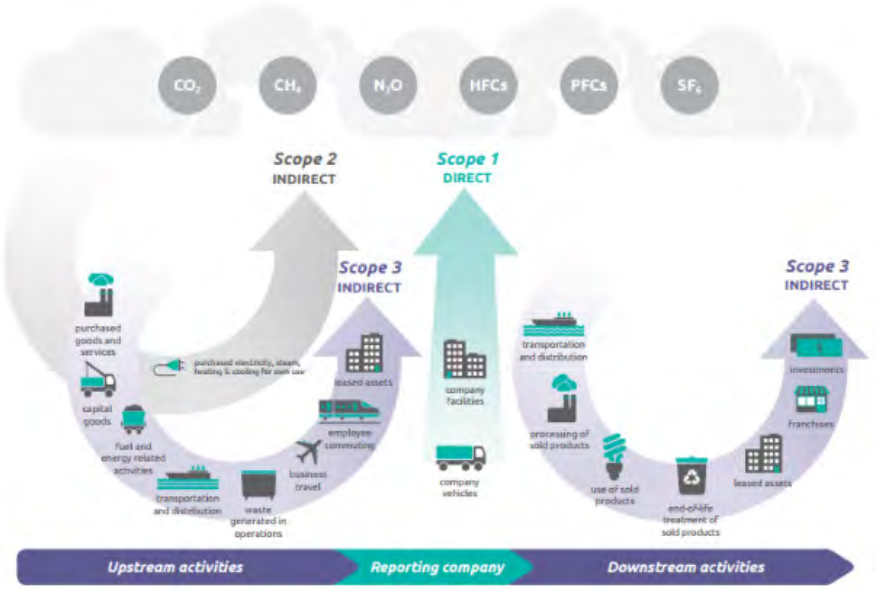
The first step to getting this process started was to calculate UC's initial carbon footprint, based on data from fiscal year (FY) 2007. At that time, UC also calculated its footprint for FY 2004 - FY 2008. Since 2008, UC has continued to monitor its greenhouse gas (GHG) emissions, and make periodic reports available publicly through the Second Nature reporting platform. The updated footprint data contained in this chapter is a continuation of this ongoing reporting process and utilizes data that has been collected through FY2018.

This report, like UC's first Climate Action Plan published in 2009, sets updated goals for emissions reduction targets and timelines. Meeting them will depend very much on successful completion of the various Goals and Objectives outlined in the Sustainability Plan outlined in Chapters 2 and 3—especially the items focused on buildings, energy, and transportation, and changing campus culture.

# Methodology

The original methodology for completing an institutional carbon footprint (also called a greenhouse gas inventory or GHGI) was developed because the United Nations Framework Convention on Climate Change (UNFCC) required participating nations to measure and report their annual national emissions. Since then, that framework has been adapted for developing GHGI's at many other scales: for states, cities, corporations, nonprofit organizations, campuses and individuals. Standard methodologies have evolved over time and continue to be refined. These methodologies have been codified in guidance issued by the GHG Protocol—a partnership between the World Resources Institute (WRI) and World Business Council on Sustainable Development (WBCSD) that facilitates global multi-stakeholder consensus and guidance regarding the development of GHGI's .

The tool used to develop all UC's carbon footprints is the Campus Carbon Calculator™ provided from the University of New Hampshire (UNH). The Calculator was selected because it is based on the GHG Protocol standards, has been developed and tailored specifically for use by institutions of higher education, and is the tool most often used by other universities




*Graphic 1*

undertaking this exercise. Because the Calculator is based on the continually-evolving GHG Protocol, it has changed over time to reflect the refinement of "best practices."

Between the completion and submission of UC's original GHGI in 2009 and this update, several important changes were made to the Calculator. For example, new emission source categories were added, and several existing ones were subdivided and/or renamed. By far the largest changes to the Calculator, though, involves reorganization of emission sources into category by "Scope"—defined based on the framework provided in the GHG Protocol:

- **Scope 1 –** This scope is focused on the emissions that are directly under the control of the university's administrative departments.
- **Scope 2 –** This scope is focused on the emissions that are indirectly under the control of the university's administrative departments through purchase agreements.
- **Scope 3 –** This scope is focused on the emissions that are intrinsic to the functioning of the university —but that administrative departments may have little or no direct control over because they are "upstream" or "downstream." This scope of emissions is important for developing buy-in from the larger campus stakeholders, shifting economies and markets, and driving broader social change, but also can be an extremely difficult one to accurately quantify and mitigate.

According to the GHG Protocol, an institutional inventory must include all relevant Scope 1 and Scope 2 emissions to be

| Fiscal Year | Total Scope 1 | Total Scope 2 | Total Scope 3 | Biogenic | Total Offsets | Total Emissions | Net Emissions |
|---|---|---|---|---|---|---|---|
| | MT $eCO_2$ | MT $eCO_2$ | MT $eCO_2$ | MT $eCO_2$ | MT $eCO_2$ | MT $eCO_2$ | MT $eCO_2$ |
| 2009 | 110,581 | 187,226 | 89,150 | 51 | (262) | 386,956 | 386,695 |
| 2010 | 193,442 | 85,621 | 77,910 | 46 | (312) | 356,972 | 356,660 |
| 2011 | 197,950 | 80,025 | 66,593 | 49 | (311) | 344,567 | 344,256 |
| 2012 | 184,218 | 62,476 | 67,843 | 46 | (93) | 314,537 | 314,444 |
| 2013 | 160,728 | 49,162 | 57,103 | 1,120 | (504) | 266,993 | 266,489 |
| 2014 | 142,714 | 84,132 | 61,728 | 2,903 | (485) | 288,575 | 288,090 |
| 2015 | 89,879 | 153,002 | 72,519 | 20 | (325) | 315,401 | 315,075 |
| 2016 | 129,878 | 88,405 | 66,726 | 16 | (325) | 285,010 | 284,685 |
| 2017 | 127,119 | 49,672 | 57,958 | 15 | (317) | 234,749 | 234,433 |
| 2018 | 139,193 | 40,593 | 57,712 | 8 | (311) | 237,498 | 237,187 |

Baseline Years

*Figure 4.1*

considered complete; any Scope 3 reporting is optional. According to UC's participation in the Climate Commitment, though, the University must also report three specific aspects of its Scope 3 emissions: commuting, business travel and air travel from study abroad programs.

Like all institutional GHGI calculation tools, the Calculator asks users to enter a variety of "activity data," and then does calculations using that data and a variety of embedded "emissions factors" provided by governmental and nonprofit agencies. Some of the major types of activity data required for calculating and analyzing UC's carbon footprint included the following: building fuel usage by type, campus fleet usage, amount of purchased electricity, municipal solid waste generation and disposal, use of refrigerants and other chemicals, commuting patterns, business travel patterns, and carbon sinks/offsets.

| Emission Type | 100 Year GWP |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |
| HFCs | 12 - 14,800 |
| $SF_6$ | 22,800 |
| All Others | 1 - 17,700 |

The six most common GHG emissions, as recognized by the GHG Protocol, are:

1. Carbon Dioxide (CO2);
2. Methane (CH4);
3. Nitrous oxide (N2O);
4. Perfluorocarbons (PFCs);
5. Hydrofluorocarbons (HFCs); and
6. Sulphur Hexafluoride (SF6).

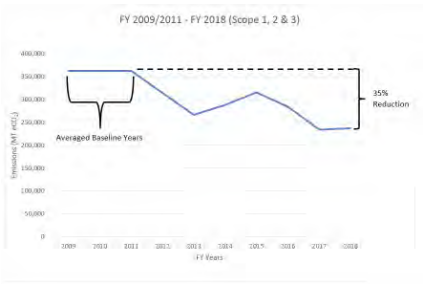
Each GHG emission type has a different "Global Warming Potential" (GWP); this is the relative climate "forcing" impact of the gas, relative to CO2 (the most common GHG), in a 100-year time span. Emissions of the other gasses emissions are multiplied by their GWP, and then added to the total CO2 emissions to get the total metric tons (MT) of Carbon Dioxide Equivalent (CO2e). All GHG emission outputs from the Calculator are reported this way (MT CO2e).

## Baseline

UC has estimates for its institutional GHG emissions going all the way back to FY 2004, but the averaged FY 2009 to 2011 has been set as the normalized baseline. As Figure 4.1 shows, annual emissions by Scope have changed over time.

The first GHGI completed for UC in 2004 did not include all of the same categories: for example, it omitted Scope 1 emissions from Agricultural Sources, as well as Scope 3 emissions from Study abroad-related air travel; the processing of solid waste and wastewater; and the upstream emissions from producing paper and from Transmission and Distribution (T&D) losses from the electrical grid—all of which were subsequently added in later versions of the Calculator.

These changing boundaries make it is difficult to make meaningful comparisons between the totals for FY 2004 (the earliest available year for which data is available), FY 2009 (the baseline year referenced in




*Graph 2*

the previous climate action plan), and those of FY 2018, or to draw useful conclusions about the trajectory of UC's carbon footprint to date. Accordingly, UC has identified a need to adjust its baseline (i.e., the benchmark against which it will set targets for GHG reduction and measure progress moving forward).

To establish the new baseline, UC has averaged its annual emissions for FY2009 - FY 2011 and is using that annual average as its new baseline for moving forward. Taking an average of three years allows for the "smoothing out" of annual anomalies that can result from numerous factors (i.e. weather, relative fuel costs, etc); while re-adjusting to a more recent timeframe accommodates the change in reporting boundaries (i.e., the inclusion of additional emissions sources into the Calculator). The resulting baseline emissions totals are shown in graph 2 —which also shows UC's emissions trajectory between those years and FY2018.

| Emission Category | FY 2009-2011 Baseline (MT $CO_2e$) | FY 2018 (MT $CO_2e$) | % +/- |
|---|---|---|---|
| Scope 1 | 167,324 | 139,193 | -17% |
| Scope 2 | 117,624 | 40,593 | -65% |
| Scope 3 | 77,884 | 57,712 | -26% |
| Biogenic | 49 | 8 | -83% |
| Total GHG Emissions | 362,832 | 237,498 | -35% |
| Total Offsets | (295) | (311) | 6% |
| Net GHG Emissions | 362,537 | 237,187 | -35% |

*Figure 4.2*

## FY 2016 Greenhouse Gas (GHG) Emissions

FY 2018 is the most recent year for which UC has calculated emissions data. Figure 4.2 compares the FY 2018 footprint emission sources against all the previous years since the FY 2009 - 2011 averaged emission baseline. As seen in the chart, UC has reduced its carbon footprint from its baseline years by roughly 34%.

The following is a review of emissions sources and drivers for FY 2018, by Scope.

### Scope 1 Emissions

The total FY 2018 Scope 1 GHG emissions were 141,649 MT of CO2e, or 44% of total GHG emissions. UC has reduced its Scope 1 emissions 15% from the FY 2009-2011 baseline. This total comprises several sub-categories:

***Co-Generation Plant:*** As noted in chapter 3, the central plant, fueled primarily by natural gas, efficiently generates power, heating and cooling for most of the campus buildings. The emissions from the plant comprise 65% of UC's Scope 1 emissions.

***Other Stationary Fuels:*** These emissions result from burning fuel to heat individual buildings not connected to the power plant. These are 33% of the Scope 1 footprint.

***Fleet:*** UC's fleet of approximately 326 vehicles produce less than 1% of its Scope 1 emissions.

***Fugitive emissions from fertilizers, refrigerants and chemicals:*** Applying fertilizers to campus grounds results in fugitive emission of N20; likewise, some refrigerants and chemicals used in equipment and/or in research are themselves potent greenhouse gases. Comparatively, however, all of these sources combined make up just over 1% of UC's Scope 1 footprint.

| Emission Category | Sub-Category | FY 2009-2011 Baseline (MT $CO_2e$) | FY 2018 (MT $CO_2e$) | % +/- |
|---|---|---|---|---|
| Scope 1 | Co-gen Electricity | 37,191 | 51,928 | 40% |
| | Co-gen Steam | 18,806 | 40,006 | 113% |
| | Other On-Campus Stationary | 107,812 | 44,487 | -59% |
| | Direct Transportation | 909 | 1,035 | 14% |
| | Refrigerants & Chemicals | 2,589 | 1,732 | -33% |
| | Agriculture | 16 | 5.7 | -64% |
| Total GHG Emissions | | 167,324 | 139,193 | -17% |

*Figure 4.3*

| Emission Category | Sub-Category | FY 2009-2011 Baseline (MT $CO_2e$) | FY 2018 (MT $CO_2e$) | % +/- |
|---|---|---|---|---|
| Scope 2 | Purchased Electricity | 117,624 | 40,593 | -65% |
| Total GHG Emissions | | 117,624 | 40,593 | -65% |

*Figure 4.4*

| Emission Category | Sub-Category | FY 2009-2011 Baseline (MT $CO_2e$) | FY 2018 (MT $CO_2e$) | % +/- |
|---|---|---|---|---|
| Scope 3 | Faculty / Staff Commuting | 12,502 | 4,206 | -66% |
| | Student Commuting | 29,824 | 24,682 | -17% |
| | Directly Financed Air Travel | 8,123 | 6,186 | -24% |
| | Other Directly Financed Travel | 14,696 | 12,063 | -18% |
| | Study Abroad Air Travel | 2,590 | 5,651 | 118% |
| | Solid Waste | (77) | (100) | 30% |
| | Wastewater | 230 | 152 | -34% |
| | Paper Purchasing | 411 | 264 | -36% |
| | Scope 2 T&D Losses | 9,585 | 4,608 | -52% |
| Total GHG Emissions | | 77,884 | 57,712 | -26% |

*Figure 4.5*

## Scope 2 Emissions

The GHG Protocol outlines two different approaches for calculating emission from electricity generation: a "Location-Based" and "Market-Based" approach. GHGI's are now required to include both—although entities are then asked to select the method that seems most applicable to their situation to include in their analyses of trends and in their programs to set and meet reduction targets.

UC's Market-Based (MB) electricity emissions for FY2018 were 40,593 MT of CO2e. Its Location-Based totals were 45,639 MTCO2e. UC has opted to use the Market-Based data for climate action planning purposes, which is what signatories to the Climate Leadership Network are asked to report and utilize for Climate Action Planning purposes. Since UC does not purchase steam or chill water from outside sources, its MB electricity emissions comprise the entirety of its Scope 2 footprint, which as noted in Figure 4.3, represents 17% of its total FY2018 GHG emissions.

This is a 65% reduction from the FY2009-2011 baseline (see Figure 4.4). Additionally, UC is in the process of signing a 15-year solar power purchase agreement, which may replace 100% of the University's purchased electricity with green, carbon-free power. This purchase will effectively reduce Scope 2 emissions to zero—while providing cost savings and budget predictability.

## Scope 3 Emissions

Total FY 2018 Scope 3 GHG emissions were 57,712 MT of CO2e, or 24% of total GHG emissions. This represents a 26% reduction from the FY2009-2011 baseline (see Figure 4.5).

Scope 3 can include any number of "upstream" and/or "downstream" emissions sources. As noted above, signatories for the Climate Leadership Network are required to estimate emission from commuting, business travel and study abroad air travel—and encouraged to include other sources as well. UC's GHG inventory includes the following Scope 3 sub-categories:

***Student, Staff and Faculty Commuting:*** Getting to and from school/work can have a big impact. Together, these two categories account for 50% of Scope 3 emissions. Reducing these emissions is a priority for



UC, as embodied in the Objectives outlined in chapter 3, and it has made significant progress in reductions from the 2009-2011 baseline (>50%).

***Directly Financed Air and Ground Travel:*** These emissions are the indirect result of faculty, staff and student travel on University business: for example, to attend conferences and meetings, or to conduct research. Such travel accounts for an estimated 11% of the Scope 3 footprint. Options for reducing them in the future may involve greater use of videoconferencing and/or more low-carbon modes of travel.

***Scope 2 T&D Losses:*** These are due to the losses that happen during the transmission and distribution of power purchased by the campus from a utility. They accounted for roughly 8% of UC's estimated Scope 3 emissions profile in FY2018. The university has little control over these emissions—except to the extent it can purchase less power and generate more on site.

***Study Abroad Air Travel:*** The flights taken by students studying abroad generate carbon emissions. Realistically, the only way to deal with these emissions is to purchase or create carbon offsets—since studying abroad is an important experience that the University wants to continue to promote.

***Treatment of Municipal Solid Waste and Wastewater*** generated on campus results in fugitive emissions from the landfill and the treatment facility. This is a less than 1% of the FY2018 Scope 3 total.

***Purchased Paper:*** The emissions associated with producing paper are notable—and traditionally academia has been a heavy user of paper products. Proportionally, however, this is also a negligible source (<1%) of emissions for UC, as for most campuses.

### Biogenic Emissions

Combusting biomass (e.g. wood chips or wood pellets) or biofuels (e.g. ethanol or biodiesel) results in carbon dioxide emissions. These CO2 emissions are not to be reported as part of the Scope 1, 2 or 3 categories, because they are considered "carbon neutral;" since these fuels are plant-based and the plants would decompose eventually as part of their natural life cycle, the resulting carbon dioxide would be released back into the atmosphere at some point, anyway. However, because emissions are produced, the GHG Protocol now recommends reporting these emissions in a separate Biogenic category, rather than excluding them from the inventory altogether. In FY 2018, UC had 8 Metric Tons of biogenic emissions, which came from the use of alternative fuel vehicles (E85) in UC's campus fleet. This biogenic total is down from earlier years, when some wood pellets were used for heat on campus.

### Offsets and Sequestration

GHG emission offsetting is the process of using carbon positive GHG emission reductions to offset the negative impacts of an institution's carbon footprint. Examples of carbon offsets methods include; planting trees which sequester carbon, forest preservation, using biomass or methane from landfills or agricultural processes for energy production, and diverting waste from the landfill to a composting program.

In FY 2018, UC composting initiative generated an estimated 1,107 tons of compost, which resulted in carbon sequestration totaling 311 MT of CO2e (0.1% of total GHG emissions). This represents more than a three-fold increase over the FY2009-2011 baseline. For more information about these sources, see the website.

## Trend Analysis and Contextualization

It can be difficult to make meaning of raw numbers of MT of CO2e. The most important thing to understand is that the world needs global emissions to be reduced drastically and rapidly: something on the order of 80% reductions by 2050, with the bulk of those coming by 2030. As noted above, UC has seen estimated reductions from its baseline of 35% relative to its FY 2009/2011 averaged baseline, which is a very positive trend—but still leaves a lot of work to do to reach 80% by 2050.

### Growth as a Factor

Projecting forward, the "business as usual" assumption is that without continued commitment and effort, growth will drive the campus emissions upward. Changes over time are impacted by many drivers. To further contextualize UC's carbon footprint, it is necessary to look

at some of these: for example, the annual budget size, population size, amount of building space and cost of energy used to power the University.

In the revised budget of FY 2018, UC's total budget was $767,008,696. In FY 2018, UC had a student population of nearly 33,000 (FTE) students, a faculty and staff size of nearly 8,000. Altogether the total UC population was over 40,000 individuals who attended, taught or worked at the University. The buildings included in this analysis combine for a total of 17,458,240 Gross Square Feet (GSF). This includes 2,837,734 GSF of medical facilities in the area that are not UC buildings but have energy supplied to them from UC utility plants. These factors together influence the size of UC's carbon footprint (see figure 4.7).

| FY | Full Time Equivalent | Percentage Increase per Year | Square Footage | Percentage Increase per Year | Net Emissions (MTCO2e) | MTCO2e/ Student | MTCO2e/ 1,000 GSF |
|---|---|---|---|---|---|---|---|
| 2009 | 26,055 | -17.2% | 16,543,428 | 31.6% | 386,695 | 14.84 | 23.4 |
| 2010 | 27,471 | 5.4% | 17,160,362 | 3.7% | 356,660 | 12.98 | 20.8 |
| 2011 | 28,361 | 3.2% | 17,281,282 | 0.7% | 344,256 | 12.14 | 19.9 |
| 2012 | 29,371 | 3.6% | 17,491,282 | 1.2% | 314,444 | 10.71 | 18.0 |
| 2013 | 30,680 | 4.5% | 17,483,462 | 0.0% | 266,489 | 8.69 | 15.2 |
| 2014 | 31,966 | 4.2% | 17,507,501 | 0.1% | 288,090 | 9.01 | 16.5 |
| 2015 | 33,361 | 4.4% | 17,332,080 | -1.0% | 315,075 | 9.44 | 18.2 |
| 2016 | 33,361 | 0.0% | 17,348,572 | 0.1% | 284,685 | 8.53 | 16.4 |
| 2017 | 34,290 | 2.8% | 17,371,419 | 0.1% | 234,536 | 6.84 | 13.5 |
| 2018 | 34,877 | 1.7% | 17,458,240 | 0.5% | 239,643 | 6.87 | 13.7 |

*Figure 4.6*

**Comparison to Other Schools - Scope 1, 2 & 3**

| Institutions | Emissions (FY2018) | Student (FTE) | MTCO2e/ Student | GSF | MTCO2e/ 1,000 GSF |
|---|---|---|---|---|---|
| Cuyahog Community College | 60,288 | 14,100 | 4.3 | 3,098,722 | 19.50 |
| Bowling Green State University | 95,940 | 15,764 | 6.1 | 5,485,791 | 17.50 |
| Ohio University | 148,574 | 21,778 | 6.8 | 8,364,849 | 17.80 |
| University of Cincinnati | 239,643 | 34,342 | 7.1 | 17,458,240 | 13.73 |
| U.S. Average - doctoral-granting | | | 7.1 | | 17.10 |
| Ohio State University | 629,722 | 50,978 | 12.4 | 24,426,000 | 25.80 |
| University of Toledo | 519,432 | 17,293 | 30.0 | 7,822,755 | 66.40 |

Source: Second Nature Reporting Platform

*Figure 4.7*

## Peer Comparisons

It may also be potentially useful to look at UC's Scope 1 and 2 carbon footprint compared to that of other colleges and universities, as depicted in Figure 4.7. As part of the Carbon Commitment, UC must also consider some of its Scope 3 emissions. These are some of the hardest to influence. UC is working hard through education and outreach, which is explored in chapter 2, to mitigate these emissions by changing culture and behavior.

# Reduction Strategies and Goals for UC

In the Intergovernmental Panel on Climate Change's (IPCC) Special Report on Global Warming of 1.5°C, released in 2017, scientists from around the world agreed that it is vital to realize a rapid and significant decrease in global GHG emissions in order to preserve climate stability: specifically, the report calls for a global 45% reduction in emission by 2030, and 80% reductions by 2050. UC supports this goal — and given the University's 35% reduction since 2010, is well on its way to meeting these targets. A potential 15-year solar power purchase agreement currently being investigated could eliminate Scope 2 emissions, combined with the energy conservation and efficiency measures outlined in chapter 3 will move UC to an estimated 55% reduction against the FY 2009/2011 baseline, more than achieving this IPCC goal as early as 2020 or 2025. This accomplishment should be celebrated by the University, and emulated by other colleges and universities around the country, as a financially-sound strategy for achieving global emission goals.

Beyond these absolute global reductions, there are many other ways to look at and set goals around emissions reductions: UC is tracking its emissions reductions by scopes, and by intensity, as well as in absolute terms.

## Targets for Scopes 1 and 2

The emissions from Scope 1 and 2 combined are the ones most directly under the university's control. There is an interplay between Scope 1 and 2 at UC because the University generates and buys energy dynamically—so in many ways it makes sense to group them. Together they account for 76% of UC's footprint.

UC has adopted a 45% by 2030 reduction goal for its Scope 1 and 2 combined, which—as noted above—it is well on track to meet and even exceed. This is not only a positive reduction against the FY 2009/ 2011 baseline, but when the projected business-as-usual scenario is considered – if UC administration had done nothing in the last 10 years to reduce its emissions – the results are astonishing.

## Goals for Scope 3

UC will continue to strive to minimize Scope 3 emission through the cultural changes suggested in Chapter 2 and transportation, purchasing, waste and dining strategies suggested in Chapter 3. The University has established a Scope 3 reduction target of 45% from the baseline, by 2030.

## Stationary Combustion Emissions

UC will work towards a 30% reduction in Stationary Combustions Emissions by 2030 from a 2010 baseline. These reductions will be achieved through utilizing the following strategies:

- Renovations and energy saving projects, including retrofits of residence halls, MSB, Rieveschl, CARE, Vontz, and Kettering Addition, installing energy recovery in energy intensive buildings
- New Chillers
- Demolition of inefficient space (Crosley).
- Participation in the Cincinnati 2030 District. Note, the 2010 baseline is actually a three-year-average baseline for the years 2009-2011

## Purchased Electricity Emissions

UC will work towards a 80% reduction in Purchased Electricity Emissions by 2030 from a 2010 baseline. The University has already reduced its purchased electricity footprint by 65%. These additional reductions will be achieved through utilizing the following strategies:

- Continued generation of electricity through cogeneration at central plant.
- Renovations and energy saving projects (i.e. adding occupancy sensors, LED lighting retrofits, residential hall retrofits).
- Purchase of wind energy for non-uptown buildings.
- Participation in the Cincinnati 2030 District. Note, the 2010 baseline is actually a three-year-average baseline for the years 2009-2011.

## Scopes 1, 2, and 3 Emissions

UC will work towards an 80% reduction in total scopes 1,2, and 3 emissions by 2050. The University will continue to collaborate and innovate to get as close to carbon neutrality as possible by mid-century.

## Carbon Neutrality

Looking to the future, the University will strive to achieve Carbon Neutrality by the year 2075. Taking into account the diversity of work that the University is currently doing related to decarbonizing its infrastructure while working to create a culture of sustainability, the efforts to achieve a net zero carbon footprint are possible. The University has the capability of moving from being a source of carbon to being a sink for it, through continuing to create and enhance the built environment in a manner that is ecologically restorative. Future opportunities exist with carbon sequestration amongst the University's campuses.

## CARBON REDUCTION NEXT STEPS

### Reduce amount of Greenhouse Gas Emissions

- Scopes 1 & 2 45% reduction by year 2030 based with 2010 base year.
- Scope 3 45% reduction by year 2030 based with 2010 base year.
- Stationary Combustion Emissions 30% reduction by year 2030 with 2010 base year.
- Purchased Electric Emissions 80% reduction by year 2030 with 2010 base year.
- Scopes 1, 2, 3 80% reduction by year 2050 based with 2010 base year.
- Carbon Neutral by 2075.

## Conclusion

UC has demonstrated an encouraging and impressive track record of combining GHG reductions and financially-savvy energy management over the past decade and has a strong foundation upon which to continue to lead. Implementing the energy and climate mitigation strategies outlined in chapter 3, and Table 1 will be essential to ensuring that the University can meet its carbon footprint reduction target and move, ultimately, toward carbon neutrality. Taking these steps to help prevent significant future climate disruption will also have many ancillary benefits in terms of containing costs and improving quality of life in our community.

However, the unfortunate reality is a level of climate disruption is already occurring—driving increased annual temperatures, more variable and extreme weather, and shifts in ecosystems. Even if UC and every other organization on the planet stopped producing greenhouse gas pollution tomorrow, there are still high enough concentrations of carbon pollution in the atmosphere that UC and the greater Cincinnati region will have some level of climate change to deal with in the foreseeable future, and it's quite likely that climate change impacts will become more prominent before achievement of global stabilization of greenhouse gas pollution. In other words, UC needs to plan for a future in which more pronounced climate disruption is inevitable—and it has begun doing exactly that.

# Chapter 5 Fostering Resilience

## Fostering Resilience - Climate Change Adaptation & Preparedness

*We have the capacity to create a remarkably different economy: one that can restore ecosystems and protect the environment while bringing forth innovation, prosperity, meaningful work, and true security.*

– Paul Hawken, Environmentalist

The current and growing evidence of the impacts on climate change in communities across the globe is sobering, and points to the need for urgent action—but it also presents a number of positive opportunities. A growing international movement is embracing the idea of climate resilience as a goal that can have many social and economic benefits beyond the obvious benefit of reducing climate risk. Figure 5.1, from the Community and Regional Resilience Institute, encapsulates this notion.

UC recognizes the need for and the opportunities inherent in embarking on a journey of climate resilience planning, and in that spirit, has begun a conversation among a wide array of stakeholders about how things are likely to change and how the University can prepare for those changes. Because UC is a part and parcel of the greater Cincinnati community, this is an issue in which it is essential that UC work with its many civic and private sector partners to plan for necessary adaptation and ensure local resilience. This effort dovetails with initiatives already underway by the City of Cincinnati, county and state governments, local nonprofits, other Ohio and Kentucky universities.

In November 2017, the UC Office of Sustainability kicked off what is an ongoing campus-wide dialogue about assessing current levels of climate resilience at UC and planning to improve it over time. Moving forward, UC will continue to convene stakeholders to develop a campus-wide vision for resilience, overarching goals, specific strategies, and an implementation plan for those strategies.

*Above: Volunteers in the UC Soiled Hands Learning Garden*

Generally, resilience on college campuses is:

- Concerned with domains *beyond traditional emergency management;*
- About the *whole* of an IHE – marshalling all of its resources and capacities;
- About managing change and disruptions in increasingly turbulent times, and
- About *seizing opportunity in change* and taking advantage of disruption.


**Figure 1: Resilience Hierarchy**

*Figure 5.1*

## Understanding the Risks

One key concept embedded in the notion of climate resilience planning is that of managing and reducing risks to the community to prevent the need for a response—which many local and regional planning agencies already do as a matter of course. Hamilton County, for example, has a comprehensive Hazard Mitigation plan that was last updated in 2018, which calls out risk to the greater Cincinnati area from eleven threats; these include severe storms (including winter), flooding, extreme heat, drought, and landslides. The plan details a long list of strategies and recommendations for reducing the risk from these occurrences.

However, as noted in the preceding section, resilience planning also goes far beyond the risk mitigation and disaster preparedness frames which are the foundation for hazard mitigation plans like Hamilton County's. For one thing, resilience planning is about looking for opportunity to improve upon the status quo, not simply to protect or maintain it. Also, hazard mitigation planning only considers quantifiable financial risks to property or infrastructure; resilience planning, by contrast, looks at risks that may not be so tangible or quantifiable, including risks to human health, to ecosystem integrity, and to social institutions.

One final and very important difference: hazard mitigation plans gauge the likelihood of threats like flooding or extreme weather by looking at the historical occurrence of those conditions in the community. Resilience planning requires the acknowledgement that the past is no longer a reliable predictor of future climate conditions or climate threats in any given region; by definition, climate change means that future conditions will be different from what has been experienced historically.

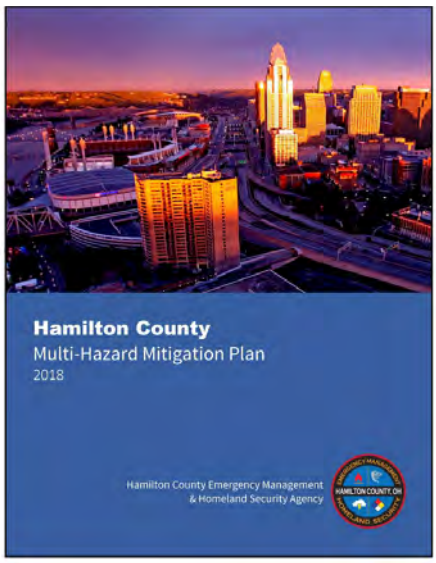
How, then, is the climate in UC's region likely to change? Thanks to a substantive, respected and growing body of science that uses modeling to understand climate dynamics and the impact of changing atmospheric greenhouse gas levels on local and regional climate patterns, reasonable predictions are available. Starting in 1990, with ongoing support from administrations of both political

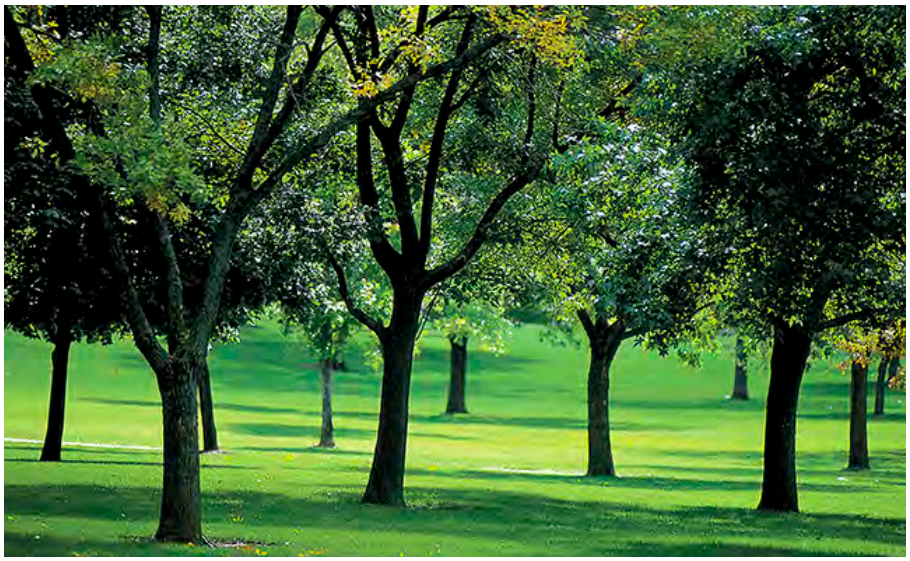
parties, the US Global Change Research program has undertaken an extensive multi-agency collaborative effort to model the impacts of climate change on the United States, and to do so on a regional scale. The results of this effort are the National Climate Assessment, which tells us that the greater Cincinnati area will experience the following changes in in this century:

***More (and more intense) heat waves*** - Already, the Cincinnati area sees approximately 20 days above 90 degrees F annually. Intense heat of this nature threatens productivity; presents possible health risks for students, staff and faculty alike; and limits the ability to undertake various normal outdoor activities. By 2050, the NCA predicts an increase of 15 more days above 95 annually, which is likely to have multiple operational impacts for UC. The NCA also predicts 300-375 additional cooling degree days—a 25-30% increase—which is likely to drive up energy demand and could impact costs.

***More extreme rainfall*** - More precipitation coming in shorter bursts of time will mean more flash flooding, especially in low-lying riverine areas—with implications for buildings and transportation systems. This will hamper the ability of certain places to continue operating, of people to get to work or to class, and/or of service providers to continue to provide services. This will be especially disruptive because it will be intermittent.

***Increased likelihood of drought*** - Three factors are likely to lead to exacerbated drought conditions in the region: the likelihood of more consecutive days without precipitation, the increase in high heat which will increase evaporation of surface water, and the increase in the number of extreme precipitation events—which may bring more water overall but will make it impossible for that water to be absorbed into porous surfaces and be stored as groundwater before it runs off and is lost. More drought creates stress to local ecosystems, to local and regional food systems and to some local businesses and could threaten the supply of affordable water for campus operations.



***Degraded air quality*** - Excessive heat causes chemical reactions in the atmosphere that degrade air quality. This worsens health conditions like allergies and asthma; has the potential to reduce productivity of students, staff and faculty; prompts curtailment of outdoor recreational activities; and causes an accompanying overall decrease in quality of life for everyone in the community.

***Significant shift in forest cover*** - The iconic elm, ash, cottonwood, maple, beech, and birch trees that currently comprise greater Cincinnati's woodlands and street trees are not well-suited to the increase in annual temperatures and the other predicted climate changes; in addition, an increase in invasive pest species driven by the seasonal and temperature shifts will threaten them further. Loss of trees means a likelihood of increased "urban heat island" effect, compounding the issues associated with increasing temperatures. It also means a distinct change in the look and feel of the place. Long term, the region can expect to see more hickory and oak trees, as these species are more well-suited to the temperatures and climate we will have in the future.

All of these impacts present a variety of challenges to the University and the Cincinnati community.

## Frameworks for Assessing and Improving Resilience

As communities and institutions across the globe wrestle with the need to build resilience, much work is being done to determine the best processes and frameworks for approaching this task—which, as noted above, bears some similarity to Hazard Mitigation planning, but which also has significant differences. Many governmental and non-profit agencies have developed resources for communities and institutions to aid them in taking on this new planning challenge.

In higher education, most of this work is being facilitated through the nonprofit organization called Second Nature. This is the same group that supports the Carbon Commitment (formerly the American College and University Presidents Climate Commitment

or ACUPCC), to which UC is a signatory. Hundreds of universities from across the US have also committed to climate resilience planning and implementation through the Resilience Commitment and Climate Commitments (also administered by Second Nature).

Working with those institutions and a host of other scientific, NGO and governmental partners, Second Nature has developed a framework for approaching resilience planning as a dynamic and inclusive process. The Second Nature framework suggests an iterative process as represented in Figure 5.1.

The Second Nature framework also uses an important concept from other community resilience approaches to ensure that campuses are looking beyond the impacts to infrastructure or property, to consider less tangible or direct impacts that are equally important. They use the "5 Capitals" model offered by Forum for the Future, which was originally a framework for sustainability planning, but which applies equally to resilience.

According to this model, communities, institutions and organizations have "capital" across five equally important domains: Physical, Natural, Human, Social and Financial. The key to being sustainable and resilient is to increase, protect and leverage those resources.

Building and deploying all of these kinds of capital makes communities and institutions more resilient and sustainable. For simplicity's sake, other frameworks collapse these five categories into three, by combining the Human and Social into one category (still labelled "social") and by thinking of financial capital as something that is woven throughout the other three domains. As UC works with its partners to make the campus and community more resilient in the face of climate change impacts, it will continually assess the degree to which capital across these three categories—Physical, Social and Natural—is being protected, maintained and built upon.

## A Snapshot of Current Strengths and Vulnerabilities

Climate resilience planning is not about planning for specific individual risks as much as it is about making a community more equipped to deal with any and every risk, by building a culture of flexibility and cooperation and by putting multi-faceted tools and resources in place across the different domains of capital outlined earlier. The idea is to make the institution as healthy, creative and vibrant as possible now, before climate impacts get more frequent or severe—because healthy, strong institutions, like individuals, are inherently more equipped to deal with challenges and variability.


To that end, the first step after putting structures in place for campus-community collaboration is to assess the historic and current state of our natural, physical and human capital. To begin to do that, UC has convened conversations with a range of UC and greater Cincinnati stakeholders and officials to develop an initial "inventory" of capital (physical, natural, and social, as well as financial), to identify which resources are vulnerable and which can be leveraged and built upon in the short term to make the campus and community more sustainable and resilient. These conversations have yielded a very robust initial evaluation of the current state of resilience for UC.

A couple of key themes have continually re-emerged, cutting across the assessment of all domains:

- Communication, engagement, outreach and education are critical. How can many more faculty, students, staff and community members be effectively educated and engaged in campus resilience and sustainability initiatives?
- UC has more physical and social capital than many other parts of the city (e.g. reliable and efficient energy systems, healthcare facilities that accept everyone), and people will come here during climate events; how can the University prepare to be a refuge for others without being overwhelmed?
- How to ensure students, faculty, staff and community members are equipped to be "assets" rather than "liabilities" in the face of an acute event? What programs, training or community connections can be put in place to ensure people's safety while facilitating effective communication and action, and minimizing trouble or conflict resulting from boredom, anxiety, helplessness or panic?
- UC is a sizeable institution with systems of scale and working together with the City can broaden that influence further. However, a great deal still depends on the action of individual community members, and the campus and community are still very much at the mercy of natural, economic and social forces beyond greater Cincinnati. So, how to begin to tackle the things that happen beyond the campus or community? For example, how to ensure continuity of services and access to critical supply chains (e.g. food), or to increase physical capital in surrounding neighborhoods where housing stock is sub-par and landlords are under no obligation to address it?
- How will UC fund the many programs and infrastructure upgrades that will be necessary for preparing and responding to climate change impacts?

*Above: Students during Move-In at UC*

# Next Steps

This initial snapshot of UC's current climate change-related strengths, weaknesses, opportunities and threats suggests numerous opportunities. UC will focus first on the following essential priorities to build campus and community resilience:

## Continue Planning

Continue the resilience planning and implementation process by engaging stakeholders from across the University and community to develop and adopt the following actions:

- A long-term vision for resilience at UC
- "Indicators" of resilience, from across the three domains of capital, that UC will use to evaluate progress toward achieving that vision. For example, a physical indicator of resilience might be the number of days the campus plant could run given existing fuel stores; a social indicator might be some measure of the physical, mental or psychosocial health of students/staff/faculty.
- Specific objectives, strategies, and roles and responsibilities for implementing those strategies (i.e. a detailed resilience implementation plan).
- A mechanism for regular "report-outs" to the UC community about progress, challenges, and opportunities for involvement.

## Ramp Up Research, Education and Engagement Efforts Aimed at Resilience

Gather additional information and develop more sophisticated assessments of the current state of specific types of capital; for example, around the following:

- the strengths and vulnerabilities of campus/community transportation systems and infrastructure;
- the reliability of the information technology that supports online learning platform and how to make it more resilient;
- any gaps in UC's emergency communication systems;
- the need and/or potential for increasing local food supply and/or food storage;
- the strengths and vulnerabilities in other vital UC supply chains;
- options for reducing vulnerabilities for populations on campus (e.g. people with accessibility or language barriers);
- Whenever possible, work with faculty and students to integrate data-gathering initiatives into research and curricular efforts, as well as working with key UC staff and administrators and with community partners. As noted above, engagement and education are critical components of this work. UC's Office of Sustainability will continue to participate in—and, when appropriate, facilitate—an active dialogue with the City and community partners. As the City, surrounding counties, and the state of Ohio all continue to develop and implement their own resilience plans, UC will be an active contributor to those efforts. In addition, the Office of Sustainability will work to integrate education and dialogue about climate resilience into its many existing outreach and engagement efforts with students, staff and faculty.

## "No-Regrets" Action

While there is still much to learn and to plan for, there are common-sense actions that UC can take now to protect and enhance existing physical, natural and human capital:

- Work with the campus water utility to create and test systems for ensuring the campus water supply in the case of a regional weather/climate emergency.
- Continue to improve energy efficiency across campus, investigate and implement systems for energy storage and options for renewable fuels if/as they become available, appropriate and cost-effective.

- Work with the IT departments on campus to bolster the resilience of all of UC's IT systems. Continually improve campus and community communications systems (emergency and day-to-day).

- Work with UC Landscape Architect and UC Grounds Maintenance to diversify tree species on campus.

- Continue to support and improve health and wellness campaigns and resources for students, staff and faculty.

*Above: UC commencement ceremony*

## Conclusion

At the heart of the concept of climate resilience planning is the idea that by acknowledging the reality of significant future disruption, communities can be inspired to embrace both their strengths and their potential. Through this embrace, they can move boldly toward a vision of a future that is indeed different—and also better and richer. They can increase and leverage their physical, natural and social capital to create more vibrancy and diversity, more opportunity and connection, more beauty and well-being.

Of all of the capital that UC has at its disposal to support these efforts, by far the most important is the social capital that our students, staff and faculty possess. They can offer their vital knowledge and engagement in fields from planning and design to health and well-being to environmental conservation to economics and business to liberal arts; strength of character and careful, critical habits of mind; and—perhaps most importantly—deep wells of creativity, energy and courage.

With those strengths to bring to bear, the University is well-positioned not only to build its own institutional resilience, but also to fulfill its institutional mission to "…create opportunity, develop educated and engaged citizens, enhance the economy and enrich our University, city, state and global community."

# Chapter 6 Concluding Thoughts

*If it can't be reduced, repaired, rebuilt, refurbished, refinished, resold, recycled or composted, then it should be restricted, redesigned or removed from production. – Peter Seeger*

*The environment is in us, not outside of us. The trees are our lungs, the rivers our bloodstream. We are all interconnected, and what you do to the environment ultimately you do to yourself.*

*– Ian Somerhalder*

*Above: Students and faculty tour the UC Central Utility Plant.*

The University of Cincinnati (UC) continues to be grateful to its peers who are participants in STARS and/or the Climate Leadership Network, with whom it is continually learning and working with to model leadership. Likewise, UC appreciates the resources, support and facilitation provided by AASHE and Second Nature to help all of their members and signatories "make good" on their commitments. UC believes that the STARS and Carbon Commitment missions, and broad base support among more than 1,200 US colleges and universities participating in one or both programs signals a significant change in the sustainability expectations for institutions of higher education and their students, faculty, and the communities they serve.

## Strengths and Opportunities

This plan helps UC meet the requirements of STARS and the Carbon Commitment—but it also represents so much more. A primary value of going through the process of creating an integrated, updated Sustainability and Climate Action Plan has been the continued centralization of documentation pertaining to all sustainability efforts at the University. This centralization also served as a collaborative working map of present and future resources for sustainable efforts. Another value has been continued successful collaborative process among the UC stakeholders.

The plan also updates the short- and long-term goals from the original 2009 Climate Action Plan that acts as a multi-departmental framework, or blueprint, for initiating change throughout the campus. Prioritization separates the low-hanging carbon opportunities from the high-hanging non-carbon projects and efforts. Understanding these priorities is critical for seeking local, state and national funding through grants, endowments and direct financial assistance. Yet another

value of this planning process was to identify the existing and untapped sustainability resources on campus.

With the completion of this 2019 Sustainability and Climate Action Plan, UC has demonstrated its commitment to a greener and more sustainable campus. UC has much to be proud of when looking at the sustainable work listed throughout the chapters and appendices of this report. This work is built on a history of progressive leadership from UC's presidents and the hard work of its staff, faculty and students.

With his commitment to bold goals in this 2019 UC plan, President Pinto demonstrates his leadership and commitment to sustainability at UC. Past President Nancy L. Zimpher institutionalized a voice for sustainability by signing Administrative Memo 135 in 2006. This memo supported the efforts of a few individuals championing the cause and launched the university's Leadership in Energy and Environmental Design (LEED) certified building program, when LEED was not as widely recognized as it is today.

Past President Zimpher also drew a line in the sand by signing with ACUPCC and providing her support of an "All University" committee, PACES (President's Advisory Council on Environment and Sustainability).


The PACES committee advocates that sustainability be viewed as a central component of the new agenda.

Adopting sustainability as a long-term goal will affect every aspect of campus activity. The implementation of these goals can achieve significant savings in the long term and provide a cutting-edge image for the university in attracting students and faculty. For example, a goal currently championed by PACES is a 2 to 3% annual reduction of energy used by buildings.

Meeting this and other goals will require system and behavioral changes at the university.

It is up to individuals at UC to reexamine their work, study, and teaching styles and to incorporate sustainability and efficiency into these practices. It is important for managers, department chairs and teachers to encourage new outlooks and to reward efforts and accomplishments in these areas. The implementation of new systems and innovative changes will foster a culture of sustainability at UC and will ensure that incoming students and faculty are immediately immersed in UC's sustainable culture and have opportunities to participate on many levels.

At a university such as UC, students and non-tenured faculty are relatively transitory. The university experience for these individuals is short-term. This poses a challenge to empower these individuals to build a lasting legacy during their time at UC. This plan has documented their disparate activities, but going forward PACES must unite these efforts into an organized and well-orchestrated effort. This will reassure the students and faculty who dedicate their time to these efforts that their work will continue and that individuals will be recruited to carry on their mission. The opportunity to do sustainability work at UC by students and faculty is limitless through their courage, imagination, and pursuit of a better world.

## Challenges of Implementing this Plan

UC is not complacent with its past accomplishments. This plan continues the University's journey to address their climate change challenges in concert with the efforts and challenges at the national and international levels.

The challenges to implementation of this plan are large and will likely continue over several decades. They include: meeting the 2019 sustainability goals of President Pinto, mitigating or compensating for the high carbon content of power purchased from Ohio's electricity grid, changing ingrained mindsets and outdated systems at the university, fostering new leaders and voices among constantly changing students and faculty members, and maintaining flexibility in the evolving context of sustainability challenges—including climate change, and rapidly developing new markets, policies, and technological solutions.

A key hurdle to reducing UC's GHG emissions is the high carbon content of power purchased from Duke Energy's electricity grid. This challenge is tied directly to the heavy dependence on fossil-fueled power plants in Ohio and the surrounding states. Cutting electric demand and

diversifying the university's supply can help mitigate financial and other risks posed by the possibility of future regulation, as well by growing climate change impacts in the region.

A further challenge is fostering sustainability leadership at UC. As this report demonstrates, behaviors and systems at UC are changing, but not as comprehensively or as rapidly as needed. At times, a more sustainable world is difficult to imagine. Many fear that radical shifts toward greater sustainability, including those needed to avert global warming of more than 2°C, are not possible – but this is short-sighted, for the positive changes are happening daily.

The current cultural, social and environmental paradigm shift is not unlike the shift that occurred in the early 20th century when cars, planes, helicopters, and electricity rapidly became commonplace. The individuals today professing that climate change cannot be overcome are from the same mold of ones who thought automobiles were a passing fad in the early 20th century. Now is the time for bold action, practice and experimentation, and for staying informed of new sustainability and climate change solutions. These opportunities could include: new forms of power generation, research breakthroughs, funding sources, and positive outcomes from the continual—and sometimes bitter—cultural and political debates around climate and sustainability issues. These are several of the challenges that this plan addresses, but as demonstrated in this plan the UC community is up to the task.

## Getting Involved

To all who have taken the time to read this Sustainability and Climate Action Plan – thank you. If you are a UC affiliate, please reflect on its messages and consider the opportunities to do your part at UC to mitigate climate change. For other readers, please feel free to take the ideas and strategies detailed in this plan and adapt it for your own purposes. Working together as a university and a regional, national and international community we can succeed!

To start this process, feel free to contact any of the campus groups.

Additionally, there are a number faculty, departments, classes, projects, and lecture series throughout campus to help you learn how to be part of this exciting work that can also be found on the website. Working together, we can make the vision of this updated plan a reality.

For more information about events, groups or resources go to UC's sustainability website at http://www.uc.edu/af/sustainability/ or follow UC Sustainability on Twitter at twitter.com/UCSustainable or Facebook at facebook.com/ucsustainability.

# Chapter 7 Goals and Objectives

## Chapter 2: Building a Sustainable Campus Culture

### Education

Spread sustainability throughout the curriculum

- Increase the number of courses explicitly dealing with sustainability
- Increase the number of courses with learning outcomes related to sustainability
- Create ecologically literate graduates

### Research

Increase research related to sustainability

- Increase the amount of research opportunities related to sustainability
- Expand and increase opportunities for open access of research

### Campus Engagement

Empower students, staff and faculty to adopt sustainable behaviors and be ecologically literate

- Continue to integrate co-curricular sustainability programming through collaborating with different colleges
- Increase educational programming and opportunities for all students, and focus on incoming students, international students and transfer students
- Continue to integrate sustainability program across diverse students groups

### Engaging the Greater Cincinnati Community

Enhance University/City collaboration and community relations

- Foster and support opportunities for citywide collaboration, in particular the topical connections with the Green Cincinnati Plan
- Work to implement the University Impact Area Solutions Study

## Planning and Administration

Guide the institution towards sustainability

- Integrate sustainability agenda with *Next Lives Here*
- Develop a Green Office designation program
- Develop a framework for enhancing sustainability efforts at events
- Sustain and enhance the presence and influence of Sustainability Advocates

# Chapter 3: Operationalizing Sustainability - Campus Infrastructure, Policies and Initiatives

## Buildings

Green buildings through renovations and new construction

- Expand LEED certified buildings through new construction and renovation projects
- Retrofit existing buildings with energy conservation methods
- Strategic scheduling to allow certain buildings to be shut down for periods of the day/ weekends

## Landscape

Enhance and protect green space, vegetation and maintenance practices that work with nature

- Complete a biodiversity analysis
- Minimize high maintenance lawn areas
- Continue to minimize pesticide and herbicide usage
- Analyze the relationships of several campus wide systems such as stormwater, hardscape, lighting, lawn areas, transportation, landscape etc.
- Increase the amount of pervious surfaces throughout the built environment
- Incorporate multi-functional, green infrastructure into the campus landscape

## Water

Increase conservation, efficiency, and utilization of water

- Implement elements of the storm water master plan
- Continue on campus wide water conservation strategies

## Energy

Reduce the demand for, and carbon intensity of, energy on campus to reduce costs, lower greenhouse gas emissions and increase resilience

- Encourage an ethos of energy conservation and efficiency for building occupants
- Retrofit existing buildings to improve energy efficiency
- Switch to lower-carbon, renewable building energy sources
- Transition the fleet vehicles to be more fuel-efficient and less carbon-intensive

## Transportation

Increase multi-modal transportation options outside of the personal automobile

- Expand educational programming on bike safety, maintenance, and riding
- Update the UC Bike Plan
- Enhance the usage and impact of existing sustainable transportation options on campus

- Enhance the usage and impact of sustainable options for transportation off campus
- Enhance the sustainability of fleet vehicles

## Food and Dining

Improve ecologically healthy food, diet and culture

- Expand the amount of food sourced sustainably
- Increase the amount of food procured from within a 250 mile radius
- Reduce the amount of food wasted through programs such as *Leanpath* and through composting

## Purchasing

Procure material from sources that cause the least negative environmental and social ramifications

- Increase the amount of sustainable purchases
- Increase knowledge of sustainable options
- Institutionalize sustainable procurement

## Waste

Reduce waste

- Continue working building by building to enhance recycling efforts through implementing connected stations and working with occupants and staff
- Continue to increase the amount of material donated and repurposed when students move into and out of residence halls
- Increase the amount of recycling collected from residence halls
- Continue to research the feasibility of anaerobic digestion for food waste
- Reduce the ubiquity of plastic and disposable, single use materials

# Chapter 4: Reducing Emissions

## Reduce Greenhouse Gas Emissions

- Scopes 1 & 2, 45% reduction by year 2030 based with 2010 base year
- Scope 3, 45% reduction by year 2030 based with 2010 base year
- Stationary Combustion Emissions 30% reduction by year 2030 with 2010 base year
- Purchased Electric Emissions 80% reduction by year 2030 with 2010 base year
- Scopes 1, 2, 3, 80% reduction by year 2050 based with 2010 base year
- Carbon Neutral by 2075

## Implementation Strategy Matrix: Operations

# Goals for Operations

### Buildings: Provide a healthy, environmentally-friendly and productive built environment for UC students, faculty and staff

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Continue to use LEED as a tool for improving sustainability outcomes in UC buildings | New Construction: As new building are constructed, continue to make the USGBC's LEED certified criteria, while striving for Silver or Gold | | Planning + Design + Construction |
| | Rennovations: As buildings are rennovated, continue to make the USGBC's LEED certified criteria, while striving for Silver or Gold | | Planning + Design + Construction |
| Conserve resources through strategic space utilization | Schedule night/weekend classes to allow certain buildings to be shut down for periods of the day/weekends | | |
| Cincinnati 2030 District | After joining the Cincinnati 2030 District in early spring 2019, continue to work with the organization to reduce building energy use, water consumption, and transportation emissions by 50% by the year 2030 | Green Umbrella/City of Cincinnati / 2030 District | UC |

### Landscapes: Protect and enhance campus ecosystems, and utilize maintenance practices that work with nature

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Assess strengths, weaknesses, threats and opportunities related to natural systems and landscape management on campus | Analyze the relationships of several campus wide systems such as stormwater, hardscape, lighting, lawn areas, transportation, landscape, etc. | External Consultants | Planning + Design + Construction/ Grounds |
| | Complete an existing tree inventory analysis, focusing on overall tree health and quality of species | | Landscape Architect (PDC) |
| | Incorporate a tree diversification and reforestation program based on the results of existing tree inventory to combat against future insect and disease issues and improve biodiversity | | Landscape Architect (PDC) |
| Minimize high maintenance lawn areas | Analyze the usage and current light maintenance practices for the existing turf areas on campus | Brightview | Landscape Architect (PDC) / Grounds / Moving / Transportation |
| | Minimize the high maintenance turf areas on campus by **(3)%** , by implementing more sustainable low maintenance areas that require one or two maintenance mowings per year | | Landscape Architect (PDC) / Grounds / Moving / Transportation |
| Reduce toxins | Continue to minimize pesticides and herbicide usage across campus utlizing treatment programs that are more sustainable or /and organic | | Planning + Design + Construction/ Grounds |
| Increase the number of pollinators attracted to designated campus areas | Participate in the Zoo's program on landscapes to attract pollinators and measure the results. The Soiled Hands Learning Garden and Victory Parkway have already been designated. Additional opportunities exist at Clermont College and Victory Parkway. | | Planning + Design + Construction |

## Implementation Strategy Matrix: Operations

### Goals for Operations *(continued)*

**Water: Prioritize strategies to protect water supply and water quality for the campus and broader community, especially in the face of increased water-related climate change impacts.**

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Continue campus-wide water conservation strategies | Continue/expand rainwater harvesting for irrigation | | Planning + Design + Construction |
| Implement elements of the storm water master plan | Continue to store water in retention basins and control its release, to reduce the possibility of combined sewer overflow events | | Facilities Management / Planning + Design + Construction |
| | Continue/expand using chilled water to regulate building temperatures | | Facilities Management / Planning + Design + Construction |

**Energy: Reduce the demand for, and carbon intensity of, energy on campus in order to reduce costs and greenhouse gas emissions and to increase resilience**

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Encourage an ethos of energy conservation and efficiency for building occupants | Build and utilize an energy dashboard for every building on campus | | Planning + Design + Construction / Facilities Management |
| | Adjust lights, heaters, AC units, etc. when residence halls are closed over breaks | | Planning + Design + Construction / Facilities Management/ Housing |
| | Ensure lights are off in dining halls when closed over the weekends | | Planning + Design + Construction / Facilities Management/ Food Services |
| Retrofit existing buildings to improve energy efficiency | As funding becomes available, work to implement LED lights, sink aerators, temperature controlled thermostats, better insulation, etc. | | Planning + Design + Construction / Facilities Management |
| Switch to lower-carbon, more renewable sources for heating, cooling and powering buildings | Replace the three (3) R-22 chillers E-5200 ton & 2850 ton, C-5200 ton on the Uptown Campus | | Planning + Design + Construction / Facilities Management |
| | Replace remaining coal boilers with natural gas boilers | | Planning + Design + Construction / Facilities Management |
| | Purchase green power or RECs through Duke Energy Program for direct metered buildings (including Victory Parkway and Fishwick Building) | | Planning + Design + Construction / Facilities Management |
| Transition the fleet vehicles to be more fuel-efficient and less carbon-intensive | Reduce fossil fuel consumption of fleet vehicles through MPG standards in vehicles purchases | | Grounds / Moving / Transportation and Purchasing |
| | Study feasibility of installing more EV charging station on campus | | |
| | Procure electric and hybrid fleet vehicles, as existing vehicles get decommissioned | | Grounds / Moving / Transportation and Purchasing |

## Implementation Strategy Matrix: Operations

# Goals for Operations *(continued)*

### Transportation: Increase multi-modal transportation use (outside of the personal automobile), and improve the existing campus fleet *(continued)*

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Expand educational programming on bike safety, maintenance, and riding to expand the number of individuals riding bicycles | Continue to promote the "Bike Kitchen" and its services, workshops and events | | Office of Sustainability / Tour Guides / Orientation Leaders |
| | Continue to promote the "Bearcat Bike Share" Program on campus | | Office of Sustainability / Tour Guides / Orientation Leaders |
| Update the UC Bike Plan | Increase the accomodations for biking on campus by increasing the amount of zones specified for bicycles and pedestrians, increasing the amount of bike infrastructure related to bike racks, etc. | | Office of Sustainability |
| | Look for opportunities of how the University can best connect with regional partners to enhance bike infrastructure, such as through the Cincinnati Riding or Walking Netowrk (CROWN) and the topical connections with the City of Cincinnati's Green Cincinnati Plan, | City of Cincinnati/ Tri-State Trails (CROWN)/ Queen City Bike/ OKI | Office of Sustainability |
| Enhance the usage and impact of existing sustainable transportation options on and off-campus | Develop enhanced marketing and promotion for Zimride, Zipcar, the UC Shuttle system, EV Chargining stations and nightide through face-to-face outreach, tabling, social media, and targeting students at orientation. | | Purchasing / Planning + Design + Construction |
| | Expanding the influence of the UC*Metro program | Metro/ TANK | Planning + Design + Construction |

### Food and Dining: Increase the sustainability of campus food systems

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Expand the amount of food sourced sustainably | Work to quantify, measure, and track food that is labeled as "organic", so that we can set goals on increasing the amount of food that is organic | Aramark | Food Serivces |
| | Work to quantify, measure, and track food that is labled as "fair trade", so that we can set goals on increasing the amount of food that mets equitable labor and trade standards | Aramark | Food Serivces |
| | Work to quantify, measure, and track food that is labled as "non-gmo" | Aramark | Food Services |
| | Work to quantify, measure, and track food that is coming from within a 250 miles radius, so that we can set goals on increasing the amount of food coming from within this "local zone" | Aramark | Food Services |
| | Establish and maintain 65% sustainable purchasing at OTG dining center (150 food miles or organic) beginning fall 2018 semester | Aramark | |

## Implementation Strategy Matrix: Operations

### Goals for Operations *(continued)*

#### Food and Dining: Increase the sustainability of campus food systems *(continued)*

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Reduce the amount of food wasted | Expand the Leanpath foodwaste software throughout all dining halls to calculate the amount of pre and post-consumer food waste | Aramark | Food Services |
| | Composting capabilities in all Residential Dining Halls by fall 2019 | Aramark | Food Services |
| | Begin transitioning/utilizing Composting Capabilities in Retail locations by fall 2019 and 100% of retail by fall 2020 | Aramark | Food Services |

#### Purchasing: Leverage UC's considerable purchasing power to increase demand for sustainable options within markets

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Increase amount of "sustainable" purchases | Inrease purchasing of 90-100 percent post-consumer recycled and/or agricultural residue content and/or FSC recycled label office paper from 4.79% to 25% | | Purchasing / Office of Sustainability |
| | Require electronics purchased to be EPEAT Silver and ENERGY STAR labeled unless justifiable reason is given | | Purchasing/ Office of Sustainability |
| | Add information to UC's central purchasing website and UC\|Sustainability's website regarding sustainable purchasing | | Office of Sustainability |
| Increase knowledge of sustainable options | Work to flag/highlight certain products that are environmentally preferential to others in UC's internal purchasing system | | Purchasing / Office of Sustainability |
| | Seek 3rd-party verification on companies such as Sustainable Purchasing Leadership Council (SPLC) or whomever UC sees fit | | Purchasing / Office of Sustainability |
| | Look into becoming a Fair Trade University | | Purchasing / Office of Sustainability |
| Institutionalize sustainable procurement | Contracts will incorporate sustainable products as they are rebid or renewed | | Purchasing / Office of Sustainability |
| | Increase student education on sustainable prcurement through lectures, classes, and programs | | Lindner College of Business/ Office of Sustainability |
| | Campus buyers will be educated on importance of sustainable procurement | | Purchasing / Office of Sustainability |

## Implementation Strategy Matrix: Operations

### Goals for Operations *(continued)*

#### Waste

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Continue working building by building to enhance recycling efforts through implementing connected stations | Grant Funding : Annually, the Ohio Environmental Protection Agency (EPA) offers a Community Development Grant, that is applicable to purchasing new recycling and trash stations. UC received this grant in 2016. The deadlline to apply for 2019 is in February. | External Agencies/ Ohio EPA | Office of Sustainability |
| | New Construction: As new building are constructed, tie in recycling and trash station costs into the funding for the building | | Planning + Design + Construction / Office of Sustainability |
| | Rennovation Projects: As new building are rennovated, tie in recycling and trash stations costs into the funding for the rennovation | | Planning + Design + Construction / Office of Sustainability |
| Continue to increase the amount of material donated and repurposed when students move in to and out of residence halls | End of Semester "Move Out" donation **(Dorms):** Work to enhance promotional and educational efforts around partnerships in dorms with local charities. | St. Vincent de Paul | Housing/ Housekeeping/ RED/ Office of Sustainability |
| | End of semester "Move Out" re-use market **(Neighborhoods):** Work to enance the effectiveness and promotions of the annual Re*Use Market by having Sustainability Advocates canvass and do face to face outreach , in addition to existing promotional efforts. | Block Leased Units / St. Vincent de Paul | Office of Sustainability |
| | Summer "Move Out" : Taking into account that the majority of students living off campus move out throughout the summer, opportunity lies at the end of July and begininng of August, when many leases end. Work to provide central donation, recycling, and repurposing stations throughout the neighborhoods. | Local charities (SVDP)/ City of Cincinnati Office of Environment and Sustainability DPS/ CHURC/ Corryville/ CUF | Office of Community Development / Office of Sustainability |
| | Provide educational outreach for new students, volunteers and staff during "Move- In" about waste mgmt & recycling, through providing recycling information on move-in traffic maps, providing way finding recycling maps for different resdential zones, meeting with H.O.T. and Helping Hands volunteers. | | Office of Sustainability/ H.O.T / Volunteers/ RED/ Housing/ Houskeeping |
| Increase amount of recycling collected from residence halls | Implement recycling protocols for each hall including placing rescycling bins on each floor of every residence hall, with the end goal of having individual recycling bins in every room on campus | | Housing/ RED/ Office of Sustainability |
| | Provide additional recycling dumpsters an the beginning of academic year during "Move-In" to divert as much waste from the landfill as possibile. | Rumpke | Office of Sustainability/ Facility Mgmt/ RED/ Housing / Volunteers |

## Implementation Strategy Matrix: Operations

### Goals for Operations *(continued)*

#### Waste *(continued)*

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Continue to research the feasibility of anaerobic digestion for food waste | Quantify the amount of food waste being produced by institutions in the Uptown area. | | Planning + Design + Construction / Environmental Engineering Faculty |
| Reduce the ubiquity of plastic and disposable, single use materials | Work with various colleges, departments, and offices as well as university wide events, to "champion" waste reduction efforts by pledging to stop using single use plastic. Ex: Welcome Week | Campus Wide | Office of Sustainability |
| | Empower students, staff, and faculty through grassroots campaigns to be encouraged to not use plastic bags and bottles, through publishing articles in the News Record, face to face outreach, meetings, events, etc. | | Students / Office of Sustainability / Student Organizations/ Student Government |
| | Increase amount of reusable waterbottles given to students, faculty, and staff to discourage use of single use plastic water bottles | | Office of Sustainability |
| | Develop a program to recycle gloves from laboratory spaces and food service centers on campus | | |
| Reduce the amount of landfilled waste from UC athletic events | Encourage campus consumers to purchase the branded Bearcat Tote Bag when shopping at the bookstore. Continue to work with the bookstore to sell reusable bags at the point of sale. | | Bookstore (Follet) / Campus Services/Office of Sustainability |
| | Host a "Zero Waste" game in Nippert stadium | | |
| | Transition 100% of current grab and go program disposable containers to biodegradable (compostable)corn based petroleum containers | Aramark | Food Services |
| | Transition 100% of Athletic venue services to biodegradable (compostable) draft beer cups | Aramark | Food Services |

## Implementation Strategy Matrix: Education and Campus

# Goals for Education, Research and Campus and Community Engagement

### Education: Create Ecologically- and Sustainability- literate graduates that go on to become leaders in addressing the world's most critical problems

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Spread sustainability throughout the UC curriculum | Continue to measure, annually, the number of sustainability-focused and sustainability-related courses, throughout all colleges and departments | | Office of Provost/ Office of Sustainability |
| | Work with the faculty to Increase the number of courses with learning outcomes focused on or related to sustainability | | Office of Provost/ Office of Sustainability |
| | Increase the sustainability knowledge, interaction, and collaboration among colleges | | Office of Provost/ Office of Sustainability |
| Support and increase co-curricular sustainability learning at UC | Ensure that every college hosts a co-curricular sustainability lecture or presentation, highlighting esteemed work and perspectives from their respective field | | Office of Sustainability / Various Academic Colleges |
| | Translate academic outcomes and theory into practice on campus and facilitate the opportunities for campus community to practice their innovative solutions and ideas | | Office of Provost/ Office of Sustainability |
| | Increase participation in the the Office of Sustainability's Environmental Literacy Certificate of Achievement. | | Office of Sustainability |

### Research: Incorporate sustainability broadly and deeply across UC research enterprise

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Increase the amount of research opportunities related to sustainability | Annually quantify the amount of sustainability research taking place comprehensively throughout the institution, and by department and college | | Office of Research Leadership |
| | Translate research into practice on campus and facilitate opportunities for the campus community to practice their innovative solutions and ideas regarding sustainability | | Office of Research Leadership |
| | Increase the number of research based projects or competitions that requires students and faculty from different departments and colleges to collaborate | | Provost / University Wide |
| | Research the impact of bird strikes on campus buildings | | |
| Expand and increase opportunities for open access of research | Work to establish a wider recognition across all colleges and departments of the value of an Open Access approach to research | | Office of Research Leadership/Provost/Office of Sustainability / Various Academic Colleges/Libraries |
| | Work to establish a campus-wide Open Access policy as a default, with "opt-out" if/as necessary | | Office of Research Leadership |

## Implementation Strategy Matrix: Education and Campus

### Goals for Education, Research and Campus and Community Engagement *(continued)*

**Campus Engagement: Reinforce sustainability as a shared community value and empower students, staff and faculty to adopt sustainable behaviors**

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Increase outreach programming and opportunities for all students | Continue to talk to students at every freshmen/transfer/international student orientation about the role of Sustainability at UC | | Office of Sustainability |
| | Sustain and enhance the presence and influence of Sustainability Advocates by increasing the number of leadership opportunities that give them ownership over certain projects i.e.: the UC Bike Kitchen, UC Garden, Bearcat Recycling, etc. | | Office of Sustainability |
| | Increase tabling and outreach efforts on campus to enhance the presence of UC Sustainability, while educating the campus community on sustainability | | Office of Sustainability - Sustainability Advocates |
| | Collaborate with various office on campus i:e: The Student Wellness Center, Center for Community Engagement, African American Cultural Resource Center, Women's Center, LGBTQ Center etc. Ex: The existing partnership between the Soiled Hands Learning Garden and the Bearcat Food Pantry. | | Student Affairs Offices/ Student Groups/ Office of Sustainability |
| Increase "inreach" to staff and depts across campus with "Green Office Program", supporting and celebrating their work to champion sustainability efforts | Develop criteria for Green Office designation related to recycling and waste diversion, energy, purchasing, transportation, etc. | | University Offices and Departments/ Office of Sustainability |
| | Launch program and recruit and supoprt Green Office participants | | Office of Sustainability |
| Explore development of a Campus Green Fund | Survey other schools' programs to begin to imagine possible frameworks, policies and practices | | Office of Sustainability |
| | Assess demand/interest at UC for such a program | | Office of Sustainability |
| | Explore possible funding sources | | Office of Sustainability |
| Develop a framework for enhancing sustainability efforts at campus events | Create a Green Check List for event/meeting hosts to reference when hosting an event/meeting | | Office of Sustainability / Conference and Event Services |
| | Develop protocol for offering recycling, water jugs, etc. at special events/meetings on campus | | Facilities Management/ Office of Sustainability / Conference and Event Services |

## Implementation Strategy Matrix: Education and Campus

### Goals for Education, Research and Campus and Community Engagement *(continued)*

**Enhance sustainablity-related collaboration between the University and other community anchor institutions, and improve community relations**

| Objective | Opportunities/Actions | External Partners | UC Responsible Parties |
|---|---|---|---|
| Work to implement the University Impact Area Solutions Study. | Host events and programs that engage community members and educate students on community concerns with the University. | Neighborhood Associations | Community Development/ Office of Sustainability/ Center for Community Engagement |
| Integrate sustainability agenda with Next Lives Here | Work with more Cincinnati Public Schools, like LEAP Academy and Hughes High School | CPS | Office of Sustainability |
| Continue and grow collaborations on Climate Action and Resilience Planning with the City | See Table 1 | City of Cincinnati | Office of Sustainability |

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# Appendices

Implementation Worksheets
Green Events Checklist
REC Purchasing

# Implementation Worksheet – Education 1

**Objective:** Spread sustainability throughout the UC curriculum

**Responsible Parties (internal):** Office of Provost, Faculty, UC|Sustainability

**Partners (external):** N/A

**Current Status:** for 2017-2018 academic year 258 courses offered

**Opportunities and Actions**

1. Annually measure the amount of sustainability courses comprehensively throughout colleges and departments
2. Encourage professors to include sustainability in their courses
3. Increase the sustainability knowledge, interaction, and collaboration among colleges

## Implementation Worksheet – Education 2

**Objective:** Integrate co-curricular sustainability programming through collaborating with different colleges

**Responsible Parties (internal):** Academic Colleges, Office of Sustainability

**Partners (external):** N/A

**Current Status:**

Currently, the Office of Sustainability has revitalized the University's professional, not-for credit *Environmental Literacy Certificate Program*, which is planned to launch in the fall of 2019. The *Environmental Literacy Certificate* will provide students the opportunity to earn a professional certificate from the University outside of their traditional academic field of study through the pursuit of engaged, self-directed learning. Outside of the four specified discussion units that students are required to attend, the program is unique in its scope as it allows students to choose what events they attend in order to satisfy the requirement for the certificate. The diversity of disciplines explored in the Office of Sustainability's programs cultivate the prime condition for self-directed learning, as sustainability is an overarching, holistic, and all-encompassing lens for humanity, where everyone is involved. An integral part of the *Environmental Literacy Certificate* will be collaborating with different academic department to host a talk or lead a discussion unit.

**Opportunities and Actions**

1. Work with every college across the institution to host a co-curricular sustainability lecture or presentation, highlighting esteemed work and perspectives from their respective field
2. Translate academic outcomes and theory into practice on campus and facilitate the opportunities for campus community to practice their innovative solutions and ideas
3. Increase participation in the Office of Sustainability's Environmental Literacy Certificate of Achievement.

## Implementation Worksheet – Research 1

**Objective:** Increase the levels of opportunity and support for faculty and students to pursue sustainability research

**Responsible Parties (internal):** Office of Research Leadership

**Partners (external):** N/A

**Current Status:**

**Opportunities and Actions**

1. Annually quantify the amount of sustainability research taking place comprehensively throughout the institution
2. Translate research into practice on campus and facilitate opportunities for the campus community to practice their innovative solutions and ideas regarding sustainability
3. Increase the number of research based projects or competitions that requires students and faculty from different departments and colleges to collaborate

# Implementation Worksheet – Research 2

**Objective:** Expand and increase opportunities for open access of research

**Responsible Parties (internal):** Office of Research Leadership

**Partners (external):** N/A

**Current Status:**

Currently, UC has a voluntary, “opt-in” policy related to Open Access, and is in the process of working to increase OA policies and procedures throughout the institution. An example of Open Access research at UC can be observed in the Health Science Library, which provides an OA Guide created by the UC Health Sciences Library on the NIH Public Access Policy and Public Access Mandates. To help advance science and improve human health, the Policy requires that these papers are accessible to the public on PubMed Central no later than 12 months after publication. In addition, the UC Digital Resource Commons is a repository available to all UC researchers. The University is in the process of creating incentives for faculty to use the repository

**Opportunities and Actions**

1. Work to establish an open access to research policy

# Implementation Worksheet – Engagement 1

**Objective:** Increase outreach programming and opportunities for all students, focusing on incoming, international, and transfer students

**Responsible Parties (internal):** Facilities Management, Housing, Office of Sustainability, Conference and Event Services, New Student Orientation

**Partners (external):**

**Current Status:**
A diversity of outreach currently takes place across the University, from new student orientation "spotlight" sessions, student led face to face out reach that is led by the Sustainability Advocates, as well as departmental collaboration, such as the *Living in the Neighborhood Series* hosted by the Center for Community Engagement, Department of Public Safety, Office of Sustainability, and Student Wellness Center. Additionally, nearly all student centered offices regularly engage in student focused outreach that touches on sustainability.

**Opportunities and Actions**

1. Continue to talk to students at every freshmen/transfer/international student orientation about the role of Sustainability at UC
2. Sustain and enhance the presence and influence of Sustainability Advocates by increasing the number of leadership opportunities that give them ownership over certain projects i.e.: the UC Bike Kitchen, UC Garden, Bearcat Recycling etc.
3. Increase tabling and outreach efforts on campus to enhance the presence of UC Sustainability, while educating the campus community on sustainability
4. Collaborate with various office on campus i:e: The Student Wellness Center, Center for Community Engagement, African American Cultural Resource Center, Women's Center, LGBTQ Center etc. Ex: The existing partnership between the Soiled Hands Learning Garden and the Bearcat Food Pantry.

## Implementation Worksheet – 2

**Objective:** Develop a Green Office designation program

**Responsible Parties (internal):** University offices and departments, UC|Sustainability

**Partners (external):** N/A

**Current Status:**

The University is currently beginning to look at how it may best establish a green office designation program, through looking at precedence from other institutions.

**Opportunities and Actions**

1. Create a green office program where various administrative offices can champion sustainability efforts.
2. Develop a grading system to measure an office or departments level of sustainability

## Implementation Worksheet – Engagement 3

**Objective:** Explore development of a Campus Green Fund

**Responsible Parties (internal):** Administration and Finance, Provosts, Office of Research, Office of Sustainability

**Partners (external):** N/A

**Current Status:**
This tasks in in the infantile stage of development, however opportunities exist with integration with the University's strategic direction *Next Lives Here* and the Innovation agenda.

**Opportunities and Actions**

1. Survey other schools' programs to begin to imagine possible frameworks, policies and practices
2. Assess demand/interest at UC for such a program
3. Explore possible funding sources

## Implementation Worksheet – Engagement 4

**Objective:** Develop a framework for enhancing sustainability efforts at events on campus

**Responsible Parties (internal):** Conference and Event Services, UC|Sustainability

**Partners (external):** N/A

**Current Status:** A green event checklist is of voluntary solutions that individuals can take to make events more sustainability is available on UC|Sustainability's and Conference and Event Services' websites. Additionally, in the spring of 2019, the Office of Sustainability collaborated with Conference and Event Services on a series of presentation related to green event planning.

**Opportunities and Actions**

1. Create a Green checklist for event/meeting hosts to reference when hosting an event/meeting -*Completed*-
2. Develop protocol for offering recycling, water jugs, etc. at special events/meetings on campus
3. Continue to work with Conference and Event services to host green event planning informational sessions throughout the year

## Implementation Worksheet– Engagement 5

**Objective:** Work to implement the University Impact Area Solutions Study.

**Responsible Parties (internal):** Community Development, Office of Sustainability, Center for Community Engagement, Public Safety, Parking Services, Student Wellness Center

**Partners (external):** Neighborhood Associations, Clifton Heights Urban Redevelopment Corporation, City of Cincinnati

**Current Status:**
Through the implementation of the *Living in the Neighborhood Series*, multi-modal transportation initiatives, community engagement initiatives and waste diversion efforts, the University is doing a diversity of things related to addressing specific goals of the UIASS.

**Opportunities and Actions**

1. Host events and programs that engage community members and educate students on community concerns with the University.
2. Continue to host the *Living in the Neighborhood Series*, providing the opportunity for students to learn about what it truly means to be a good neighborhood and member of the community.
3. Continue to enhance the influence of multi-modal transportation alternative.
4. Continue to work to mitigate waste and blight from occurring in the neighborhoods.

# Implementation Worksheet – Engagement 6

**Objective:** Integrate sustainability agenda with Next Lives Here

**Responsible Parties (internal):** University of Cincinnati Research Institute, Office of Sustainability, Center for Community Engagement

**Partners (external):** Cincinnati Public Schools, Non Profits, Private Industry,

**Current Status:**
In the spring of 2018, the Office of Sustainability worked with CPS's LEAP Academy to install edible, ecologically restorative vegetation into the landscape of the school.

The Center for Community Engagement currently does a plethora of work related to building partnerships and enhancing opportunity for students at Cincinnati Public Schools.

**Opportunities and Actions**

1. Work with more Cincinnati Public Schools, like LEAP Academy and Hughes High School.

## Implementation Worksheet – Engagement 7

**Objective:** Continue to grow collaborations on Climate Action and Resilience City Planning

**Responsible Parties (internal):** University Wide

**Partners (external):** City of Cincinnati

**Current Status:**
In the fall of 2017, the Office of Sustainability in collaboration with City of Cincinnati's Office of Environment and Sustainability hosted a climate resilience planning charrette, with the intention of identifying issues of topical concern between the City, the University and the region. These issues have been incorporated into the goals and objectives of this plan.

In the spring of 2018, the Office of Sustainability hosted a collaborative working session with the City of Cincinnati's Office of Environment and Sustainability, analyzing topical connections between the City's Green Cincinnati Plan and the University's upcoming Sustainability and Climate Action Plan.

**Opportunities and Actions**

1. See Table 1 for a complete list of action items across the topic areas identified (i.e. Buildings, Energy, Food, Waste, Transportation, Natural Systems, Outreach)

## Implementation Worksheet – Buildings 1

**Objective:** Continue to use LEED as a tool for improving sustainability outcomes in UC buildings

**Responsible Parties (internal**): Planning + Design + Construction

**Partners (external):** N/A

**Current Status:** 11 buildings are LEED certified, 3 buildings are tracking. University wide policy that new buildings and renovations must be at least LEED Silver

**Opportunities and Actions**

1. As new building are constructed, continue to make use of the USGBC's LEED certified criteria, while striving for Silver of Gold.

2. As buildings are renovated, continue to make us of the USGBC's LEED certified criteria, while striving for Silver of Gold.

3. Work with contractors to reduce the amount of waste generated in construction and demolition projects.

# Implementation Worksheet – Buildings 2

**Objective:** Conserve resources through strategic space utilization

**Responsible Parties (internal):** Planning + Design + Construction, Facilities Management

**Partners (external): N/A**

**Current Status:**

**Opportunities and Actions**

1. Schedule night/weekend classes to allow certain buildings to be shut down for periods of the day/weekends
2. Adjusting lights, heaters, AC units, etc. when Residence Halls are closed over breaks
3. Ensuring lights are off in dining halls when closed over the weekends and holiday breaks
4. Only allow open certain buildings for meetings/classes after hours and on weekends
5. “shut down” unused buildings after hours and on weekends by adjusting lights, heater, a/c units, etc.

## Implementation Worksheet – Buildings 3

**Objective:** Cincinnati 2030 District

**Responsible Parties (internal):** Planning + Design + Construction, Facilities Management

**Partners (external):** Cincinnati 2030 District, Green Umbrella, City of Cincinnati

**Current Status:**
The University joined the Cincinnati 2030 District in the spring of 2019

**Opportunities and Actions**

1. Work with the organization to reduce building energy use, water consumption, and transportation emissions by 50% by the year 2030

# Implementation Worksheet – Landscape 1

**Objective:** Assess strengths, weaknesses, threats and opportunities related to natural systems and landscape management on campus

**Responsible Parties (internal):** Planning + Design + Construction, Grounds/Moving/Transportation

**Partners (external):** External Consultants

**Current Status:**

The University is currently in the process of mapping trees that exist on campus.

**Opportunities and Actions**

1. Analyze the relationships of several campus wide systems such as stormwater, hardscape, lighting, lawn areas, transportation, landscape etc.

2. Inventory campus trees, focusing on overall health and quantity of species

3. Incorporate a tree diversification and reforestation program based on the results of existing tree inventory to combat against future insect and disease issues and improve biodiversity

# Implementation Worksheet – Landscape 2

**Objective:** Minimize high maintenance lawn areas

**Responsible Parties (internal):** Landscape Architect (Planning + Design + Construction), Grounds/Moving/Transportation,

**Partners (external):**

**Current Status:**
The University currently has been looking for opportunities to minimize high maintenance lawn areas, in order to save fuel and to create more habitat. An example of a space of this nature is the hillside on the Northern side of DAAP along Martin Luther King Drive.

**Opportunities and Actions**

1. Analyze the usage and current light maintenance practices for the existing turf areas on campus

2. Minimize the high maintenance turf areas on campus by (3) % , by implementing more sustainable low maintenance areas that require one or two maintenance mowing's per year

## Implementation Worksheet – Landscape 3

**Objective:** Reduce Toxins

**Responsible Parties (internal):** Landscape Architect (Planning + Design + Construction), Grounds/Moving/Transportation

**Partners (external):** N/A

**Current Status:** UC Sustainability Coordinator, Landscape Architect, and Facilities Management staff meeting in the summer of 2019.

**Opportunities and Actions**

1. Continue to minimize pesticides and herbicide usage across campus utilizing treatment programs that are more sustainable or /and organic
2. Investigate how to make Integrated Pest Management more robust
3. Establish an herbicide reduction policy

## Implementation Worksheet – Landscape 4

**Objective:** Increase the number of pollinators attracted to designated campus areas

**Responsible Parties (internal):** Planning + Design + Construction

**Partners (external):** External Consultants

**Current Status:**
The Soiled Hands Learning Garden and Victory Parkway have already been designated as part of the Zoo's registered pollinator program.

**Opportunities and Actions**

1. Participate in the Zoo's program on landscapes to attract pollinators and measure the results.
2. Additional opportunities exist at Clermont College and Victory Parkway.

## Implementation Worksheet – Water 1

**Objective:** Continue on-campus water conservation strategies

**Responsible Parties (internal):** Facilities Management, Planning + Design + Construction

**Partners (external):** N/A

**Current Status:**
In the spring of 2018 and 2019, the University hosted residence hall conservation challenges, with the intention of educating students on the importance of conservation and adopting sustainable behavioral choices.

**Opportunities and Actions**

1. Using Chilled water to regulate building temperatures
2. Harvesting water for irrigation and retention purposes
3. Increase education related to water conservation

## Implementation Worksheet – Water 2

**Objective:** Implement elements of the storm water master plan

**Responsible Parties (internal):** Planning + Design + Construction

**Partners (external):**

**Current Status:** Storm Water master plan was completed in 2011. The new Lindner College of Business will feature a bio-swale along its western façade, and will also feature an intensive green roof.

**Opportunities and Actions**

1. Continue to store water in retention basins and control its release, to reduce the possibility of combined sewer overflow events.
2. Integrate proposed sewers and green roofs

# Implementation Worksheet – Energy 1

**Objective: –** Encourage an ethos of energy conservation and efficiency for building occupants

**Responsible Parties):** Planning + Design + Construction, Facilities Management, R.E.D., Housing

**Current Status:**

Currently, the University is working to encourage an ethos of energy conservation and efficiency through a variety of measures, such as the annual Residence Hall Conservation Challenge and the help of energy data visualization in the residence halls.

**Opportunities and Actions**

1. Build and utilize an energy dashboard for every building on campus
2. Adjust lights, heaters, AC units, etc. when Residence Halls are closed over breaks
3. Ensure lights are off in dining halls when closed over the weekends

# Implementation Worksheet – Energy 2

**Objective:** Retrofit existing buildings to improve energy efficiency

**Responsible Parties (internal):** Planning + Design + Construction, Facilities Management

**Current Status:**
As new buildings are constructed or renovated, the incorporation of energy conservation infrastructure is included.

**Opportunities and Actions**

1. Continuing to retrofit existing buildings with energy conservation methods, i.e: LED lights, water bottle refill stations, energy recovery systems, occupancy sensors, temperature controlled thermostats, better insulation

# Implementation Worksheet – Energy 3

**Objective:** Switch to lower-carbon, renewable building energy sources

**Responsible Parties (internal):**

**Partners (external):** External consultants, renewable energy suppliers

**Current Status:**
The University of Cincinnati has signed an agreement with American Electric Power Energy to purchase 100% of its electric supply to all University Branch Campuses and Satellite Buildings with “Green Power” at a cost less than previously paid for conventional power. This contract, which began in October of 2018, provides 100% renewable energy produced by wind turbines to UC Clermont, UC Blue Ash, UC Reading, UC Victory Parkway and university satellite buildings through mid-year 2021

**Opportunities and Actions**

1. Invest in new chillers and use chilled water to regulate building temperatures
2. Investigate opportunities to purchase renewable power for campus buildings not fueled by the cogeneration plant

## Implementation Worksheet – Energy 4

**Objective:** Transition the fleet to be more fuel-efficient and less carbon-intensive

**Responsible Parties (internal):** Purchasing, Grounds/Moving/Transportation, Athletics

**Partners (external):**

**Current Status:**

Currently the University is beginning to procure electric and fuel efficient vehicles in addition to transitioning some work trucks to golf carts.

**Opportunities and Actions**

1. Adopt MPG standards in fleet vehicles purchases, to reduce fossil fuel consumption
2. Study feasibility of installing more EV charging station on campus
3. Procure electric and hybrid fleet vehicles, as existing vehicles get decommissioned

# Implementation Worksheet – Transportation 1

**Objective:** Expand educational programming on bike safety, maintenance, and riding to expand the number of individuals riding bicycles

**Responsible Parties (internal):** UC|Sustainability, ROAR Guides

**Partners (external):** Tri-State Trails, Queen City Bike

**Current Status:**
Currently, the University performs a variety of programs related to bike education, such a tabling at orientation and open houses, annual workshops at the Bike Kitchen, the annual UC Bike Show and hosting community rides. Additionally, the Office of Sustainability and Public Safety are developing a campaign related to how to properly lock your bike on campus.

**Opportunities and Actions**

1. Continue to promote the "Bike Kitchen" and its services, workshops and events through tabling on campus, at Spotlight Orientation, Welcome Week, and open houses

2. Continue to promote the "Bearcat Bike Share" Program on campus through tabling on campus, at Spotlight Orientation, Welcome Week, and open houses

3. Host community rides with community partners like Tri-State Trails.

# Implementation Worksheet – Transportation 2

**Objective:** Update the UC Bike Plan and the UC Transportation Guide

**Responsible Parties (internal):** UC|Sustainability

**Partners (external):** City of Cincinnati, Tri-State Trails (CROWN), Queen City Bike, OKI

**Current Status:** UC published its original bike plan in 2011 and published its Transportation Guide in 2014

**Opportunities and Actions**

1. Increase the accommodations for biking on campus by increasing the amount of zones specified for bicycles and pedestrians, increasing the amount of bike infrastructure related to bike racks, etc.

2. Look for opportunities of how the University can best connect with regional partners to enhance bike infrastructure, such as through the Cincinnati Riding or Walking Network (CROWN) and the topical connections with the City of Cincinnati's Green Cincinnati Plan

## Implementation Worksheet – Transportation 3

**Objective:** Enhance the usage and impact of existing sustainable transportation options on campus

**Responsible Parties (internal):** Planning + Design + Construction, Parking Services, New Student Orientation

**Partners (external):** Zipcar, Zimride

**Current Status:**

Currently Parking Services has developed a branded marketing flag that promotes the diversity of multi-modal transportation options that the University has. Additionally, the 2014 UC Transportation Guide is in the process of being updated and the Office of Sustainability and Grounds/Moving/Transportation in the process of discussing how related transportation websites could best be centralized.

**Opportunities and Actions**

1. Develop enhanced marketing and promotion for Zimride, Zipcar, the UC Shuttle system, EV charging stations and Nightride through face-to-face outreach, tabling, social media, and targeting students at orientation.

# Implementation Worksheet – Food and Dining 1

**Objective:** Expand the amount of food sourced sustainably

**Responsible Parties (internal):** Food Services

**Partners (external):** Aramark

**Current Status:**
Currently, approximately 65% of annual dining service's purchases are sustainable food (local, and or certified organic/cage free/ human or Fair Trade).

**Opportunities and Actions**

1. Work to quantify, measure, and track food that is labeled as "organic", so that we can set goals on increasing the amount of food that is organic
2. Work to quantify, measure, and track food that is labeled as "fair trade", so that we can set goals on increasing the amount of food that meets equitable labor and trade standards
3. Work to quantify, measure, and track food that is labeled as "non-gmo"

# Implementation Worksheet – Food and Dining 2

**Objective:** Reduce the amount of food wasted in all food operations on campus

**Responsible Parties (internal):** Food Services, Office of Sustainability, Athletics

**Partners (external):** Aramark

**Current Status:**
The University currently has LeanPath food waste reduction technologies in a variety of its dining facilities. Additionally, educational events such as “Scrap Your Plate Day” have been developed as a fun and engaging way to educate the UC community on the importance of reducing food waste.

**Opportunities and Actions**

1. Expand the Leanpath food waste software throughout all dining halls to calculate the amount of pre and post-consumer food waste
2. Host a “Zero Waste” game in Nippert stadium for the 2019 season as well as for Basketball for the 2019-2020 season
3. Composting capabilities in all Residential Dining Halls by fall 2019
4. Begin transitioning/utilizing Composting Capabilities in Retail locations by fall 2019 and 100% of retail by fall 2020
5. Transition 100% of current grab and go program disposable containers to biodegradable (compostable)corn based petroleum containers by August 2019
6. Develop and implement a beverage can recycling program for 5/3 Arena by November 2018
7. Transition 100% of Athletic venue services to biodegradable (compostable) draft beer cups

# Implementation Worksheet – Purchasing 1

**Objective:** Increase amount of sustainable purchases

**Responsible Parties (internal):** Purchasing, Office of Sustainability

**Partners (external): N/A**

**Current Status:**
Percentage of expenditures on office paper that is 90-100 percent post-consumer recycled and/or agricultural residue content and/or FSC Recycled label is 4.79%

**Opportunities and Actions**

1. Increase purchasing of 90-100 percent post-consumer recycled and/or agricultural residue content and/or FSC recycled label office paper from 4.79% to 25%
2. Require electronics purchased to be EPEAT Silver and ENERGY STAR labeled unless justifiable reason is given
3. Add information to UC's central purchasing website and UC|Sustainability's website regarding sustainable purchasing

# Implementation Worksheet – Purchasing 2

**Objective:** Increase knowledge of sustainable options

**Responsible Parties (internal):** Purchasing, Office of Sustainability

**Partners (external):** N/A

**Current Status:**

**Opportunities and Actions**

1. Work to flag/highlight certain products that are environmentally preferential to others in UC's internal purchasing system
2. Seed 3-rd party verification on companies, such as Sustainable Purchasing Leadership Council (SPLC) or whomever UC sees fit.
3. Become a certified Fair Trade University

## Implementation Worksheet – Purchasing 3

**Objective:** Institutionalize sustainable procurement

**Responsible Parties (internal):** Purchasing, Office of Sustainability

**Partners (external):** N/A

**Current Status:**

UC Central Purchasing encourages preference to environmentally friendly products whose quality, function, and cost are equal to or better than more traditional products. UC construction standards require sustainable products to be used in its buildings. Energy Star products dominate the equipment purchased. Fleet vehicles are specified to assure the university meets goals for fuel efficiency and diversification, University Duplicating uses recycled paper or SFI certified products when possible. The university's food services and stationary supplies contracts include specific sections on its requirements and preferences for green products.

**Opportunities and Actions**

1. Contracts will incorporate sustainable products as they are rebid or renewed
2. Increase student education on sustainable procurement through lectures, classes, and programs
3. Campus buyers will be educated on importance of sustainable procurement

# Implementation Worksheet – Waste 1

**Objective:** Continue working building by building to enhance recycling efforts through implementing connected stations

**Responsible Parties (internal):** Planning + Design + Construction, UC|Sustainability

**Partners (external):** Ohio EPA

**Current Status:** Stations have been implemented in 10 campus buildings so far.

**Opportunities and Actions**

1. Grant Funding: Annually, the Ohio Environmental Protection Agency (EPA) offers a Community Development Grant, which is applicable to purchasing new recycling and trash stations. UC received this grant in 2016. The deadline to apply for 2019 is in February.

2. New Construction: As new building are constructed, tie in recycling and trash station costs and placement into the funding and plans for the building.

3. Renovation Projects: As buildings are renovated, tie in recycling and trash stations costs and placement into the funding and plans for the renovation.

## Implementation Worksheet – Waste 2

**Objective:** Continue to increase the amount of material donated and repurposed when students move in to and out of residence halls.

**Responsible Parties (internal):** Housing, Housekeeping, R.E.D., UC|sustainability, Office of Community Development, Facility Management

**Partners (external):** St. Vincent de Paul, City of Cincinnati Office of Environment and Sustainability, Local Neighborhood Associations, Rumpke

**Current Status:** Re*Use Market, Residence Hall move out and move in efforts, Uptown Waste Diversion. See chapter 4.2

**Opportunities and Actions**

1. Work to enhance promotional and educational efforts around end of semester move out in the residence halls.

2. Work to enhance the effectiveness and promotions of the annual Re*Use Market by having Sustainability Advocates canvass and do face to face outreach , in addition to existing promotional efforts.

3. Work to provide central donation, recycling, and repurposing stations throughout the neighborhoods when leases flip at the end of July.

4. Provide additional recycling dumpsters and schedule effective pick up times at the beginning of academic year during "Move-In" to divert as much waste from the landfill as possible.

5. Provide educational outreach for new students, volunteers and staff during "Move- In" about waste management & recycling, by providing recycling information on move-in traffic maps, providing way finding recycling maps for different residential zones, and meeting with H.O.T. and Helping Hands volunteers.

# Implementation Worksheet – Waste 3

**Objective:** Increase amount of recycling collected from residence halls

**Responsible Parties (internal):** Housing, Resident Education and Development, UC|Sustainability

**Partners (external):** N/A

**Current Status:** protocol has been written, working on implementation and funding

**Opportunities and Actions**

1. Implement recycling protocols for each hall
2. Place recycling bins on each floor of every residence hall
3. Place individual recycling bins in every room on campus

## Implementation Worksheet – Waste 4

**Objective:** Continue to research the feasibility of anaerobic digestion for food waste

**Responsible Parties (internal):** Planning + Design + Construction, Environmental Engineering Faculty

**Partners (external):**

**Current Status:** collecting data

**Opportunities and Actions**

1. Quantify the amount of food waste produced by institutions in the Uptown area.
2. Using found data, decide if an anaerobic digester makes sense for the Uptown Area

# Implementation Worksheet – Waste 5

**Objective:** Reduce the ubiquity of plastic and disposable, single use materials

**Responsible Parties (internal):** UC|Sustainability, Student Government, Student Organizations, Follet, Campus Services

**Partners (external):** Campus Wide

**Current Status:** plastic bags have been removed from certain cafes on campus and cashiers have been instructed to ask if the customer needs a bag before giving them one

**Opportunities and Actions**

1. Work with various colleges, departments, and offices as well as university wide events, to "champion" waste reduction efforts by pledging to stop using single use plastic. Ex: Welcome Week, etc.

2. Empower students, staff, and faculty through grassroots campaigns to be encouraged to not use plastic bags and bottles, through publishing articles in the News Record, face to face outreach, meetings, events, etc.

3. Increase amount of reusable water bottles given to students, faculty, and staff to discourage use of single use plastic water bottles

4. Encourage campus consumers to purchase the branded Bearcat Tote Bag when shopping at the bookstore and continue to work with the Bookstore to sell reusable bags at the point of sale.

## Implementation Worksheet – Waste 6

**Objective:** Reduce the amount of landfilled waste from UC athletic events

**Responsible Parties (internal):** Athletics, Office of Sustainability, Facilities Management, Follet, Campus Services, Aramark

**Partners (external):**

**Current Status:**
Currently, the Office of Sustainability facilitates recycling efforts with volunteers and staff support at UC Football and FC Cincinnati games. At events in Fifth Third Arena, Facilities Management facilitates recycling efforts.

**Opportunities and Actions**

1. Host a "Zero Waste" game in Nippert stadium
2. Transition 100% of current grab and go program disposable containers to biodegradable (compostable)corn based petroleum containers
3. Transition 100% of Athletic venue services to biodegradable (compostable) draft beer cups

# Green Event Checklist

Events and meetings on campus can generate a lot of unnecessary waste. Help the University of Cincinnati's students, faculty, staff, and community members achieve their goals stated in the **University's Climate Action Plan** by choosing to host a green event. Here are some suggestions and tips you can follow:

## Marketing:

- Go paperless: use email, social media, and digital signage
- Offer electronic registration
- Distribute programs, agendas, and other day-of-event materials electronically
- Include sustainability goals in promotional material
- If you choose to print a banner, etc. exclude dates so they can be used at future events (i.e. Write Bike Show!, instead of Bike Show 2014!)

## Food/Catering:

- Ask for menu options with little or no packaging, such as those on aluminum trays, or whole fruit. Opt for bulk items.
- Avoid plastic, Styrofoam, or other disposable silverware or serving ware
- Encourage attendees to bring their own reusable water bottles or travel coffee mugs
- Opt for vegan/vegetarian options
- Choose drinks provided in pitchers with reusable cups
- Choose condiments served from bulk containers
- Look for locally sourced food

## Waste:

- Contact UC|Sustainability (green@uc.edu) to discuss recycling options
- Educate hosts and attendees on what can and cannot be recycled
- Announce Recycling efforts during event
- Check with the catering staff about donating leftover food to a local food pantry
- Use recycled materials – example 100% recycled paper for printing
- Minimize single use decorations – example balloons, paper streamers, etc.
- Reuse name tags and lanyards

## Transportation:

- Plan event near access to public transportation/bike routes
- Provide public transportation routes/information to attendees prior to event
- Encourage carpools, biking, UC Shuttle, Metro, TANK, Zimride, or Bearcat Bike Share

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# Green Energy Powers Utilities!

*The University of Cincinnati has signed an agreement with American Electric Power Energy to purchase 100% of its electric supply to all University Branch Campuses and Satellite Buildings with "Green Power" at a cost less than previously paid for conventional power. This contract, which began in October of 2018, provides 100% renewable energy produced by wind turbines to UC Clermont, UC Blue Ash, UC Reading, UC Victory Parkway and university satellite buildings through mid-year 2021.*

**The Department of Utilities and Facilities Management at the University of Cincinnati worked over the last several months to complete this contract with AEP Energy. The University of Cincinnati will save more than $250,000 per year compared to what it is currently paying for electricity.**

**The procurement of this green power is projected to reduce the University's total annual greenhouse gas emissions by 29,539 tons of carbon dioxide, or 16% of annual emissions.**

**This contract provides the University with a reliable source of electricity and as well enables UC to continue optimizing use of its cogeneration plant on main campus to further reduce the overall cost of electricity and in parallel its carbon footprint. Elimination of that amount of carbon dioxide is the equivalent of keeping 30 million pounds of coal in the ground every year, planting 28,947 acres of forests, or elimination of 60 million miles of gas-burning automobiles per year.**

**This is a win-win arrangement for the University of Cincinnati, the greater Cincinnati community, and southwestern Ohio. This purchase benefits the local environment and the people in our communities, and continues the tradition of the University of Cincinnati as a leader in the ongoing effort to protect and sustain our environment.**

**The University of Cincinnati has been recognized as a Gold rated campus by the Association for the Advancement of Sustainability in Higher Education for its role as a leader in sustainable practice, research, and operations. This agreement is another step in the University's broad efforts to improve the efficiency of operations and improve the sustainable utilization of energy in all buildings.**

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**uc.edu/sustainability**
**uc.edu/af/utilities**