



The

2015 iCAP

# Illinois Climate Action Plan

*University of Illinois at Urbana-Champaign*

In a Nutshell

**IN** 2008, the University of Illinois at Urbana-Champaign signed on to the American College and University Presidents' Climate Commitment, formally committing the campus to becoming carbon neutral as soon as possible, and no later than 2050. The Illinois Climate Action Plan (iCAP) was written to guide the actions of the campus to accomplish this goal. The first iCAP was created in 2010. Five years later, it is time to review our progress and suggest revised actions and goals for making campus a role model for sustainability.

Given that we are already experiencing major impact of climate change, 2050 may not be soon enough for the campus to eliminate its greenhouse gas emissions. The 2015 iCAP therefore calls for a feasibility study to figure out what we'd need to do to accelerate our efforts and achieve carbon neutrality by 2035. Following this study, the Sustainability Council will advise the Chancellor whether to adopt 2035 as our new target date.

This summary will walk you through the highlights of the 2015 iCAP and give you a snapshot of the sustainability challenges facing the Urbana-Champaign campus. Details about all concepts, policies, and programs mentioned here can be viewed in the full version 2015 iCAP document, available at [sustainability.illinois.edu/icap](http://sustainability.illinois.edu/icap).

## BACKGROUND: HOW ARE WE DOING?

*Where do our CO<sub>2</sub> and other emissions come from?*

The chart at the right shows three categories of emissions: On campus (blue), purchased electricity (red), and off campus (green). In total, campus emitted 501,560 tons of carbon last year.

*Did we meet our 2015 goals?*

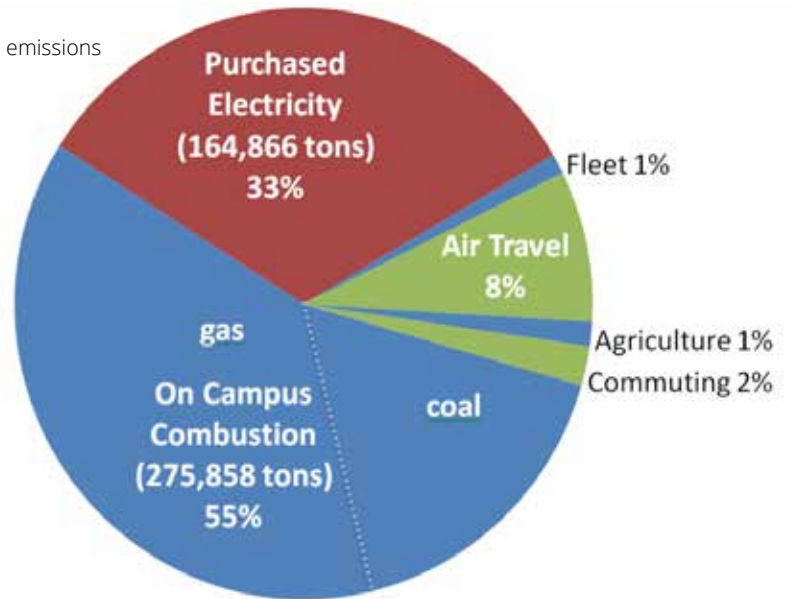
2015 was the deadline for eight objectives in the 2010 iCAP. Campus met 6 of the 8:

- ✓ Reduce existing building energy consumption by 20%
- ✓ Reduce existing building greenhouse gas emissions by 15%
- ✓ Reduce potable water usage by 20%
- ✓ Implement "no net increase in space" policy
- ✓ Develop long-term Zero-Waste policy
- ✓ Obtain 5% of electrical energy coming from renewables
- ✗ Purchase 30% of food from local sources – (we are very close at 28% local, though!)
- ✗ Reduce greenhouse gas emissions from transportation by 30%

## THE PATH TO CARBON NEUTRALITY

The 2015 iCAP outlines 47 objectives in the following categories: energy conservation and building standards; energy generation, purchasing, and distribution; transportation; water and stormwater; purchasing, waste,

**FIGURE 1:**  
Sources of Campus emissions



and recycling; agriculture, land use, food, and sequestration; carbon offsets; financing; education; outreach; and research.

### 1) ENERGY CONSERVATION AND BUILDING STANDARDS

Campus energy use is reported in units of Energy Use Intensity (EUI), the megawatt hours (MWh) of energy per square foot of campus building space used annually. Because campus constantly changes with construction and demolition, it can be confusing to focus exclusively on total energy use. EUI controls for changes in the amount of space demanding energy from year to year, to give accurate information on energy use reduction.

In 2014, EUI was down 21% from the 2008 baseline.

Goals: Decrease EUI by 33% by 2020.

Future goals: 38% reduction by 2025, and 52% reduction by 2050. It's important to note that even if the rate at which we use energy (EUI) stays the same, if square footage of campus space increases, we will use more total energy, thus increasing our footprint and undermining conservation work.

Objectives:

1. Maintain or reduce the campus gross square footage relative to the FY10 baseline.
2. Improve standards for new buildings and

major renovations by the end of FY16.

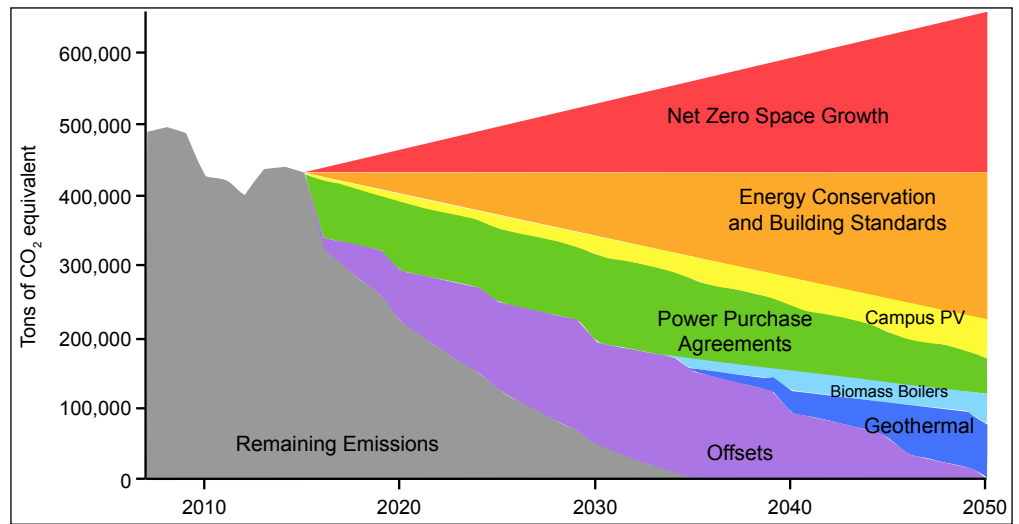
3. Strengthen centralized conservation efforts focusing on building systems, to achieve a 30% reduction in total campus building energy use by FY20. Suggested actions:
  - » Develop a campus energy conservation master plan.
  - » Complete more energy performance contracts.
  - » Expand campus retro-commissioning program.
  - » Expand campus maintenance programs.
  - » Extend campus lighting projects.
  - » Execute a fume hood efficiency program.
  - » Employ IT energy use guidelines.
  - » Install instantaneous hot water heaters, increase insulation on hot water tanks, and recover heat from chiller condensers.

4. Engage and incentivize the campus community in energy conservation, including a comprehensive energy conservation campaign, with at least 50% of units participating by FY20.
  - » iSEE's [Certified Green Office Program](#) and F&S's [Energy Conservation Incentive Program](#) are good starts, but they need expanding.
  - » Because the campus energy budget is centrally held, no individual sees financial savings for their energy efficiency (just the campuswide budget does). Find a way to reward the individual savers.

## 2) ENERGY GENERATION, PURCHASING, AND DISTRIBUTION

If half of emission reductions needed to get to carbon neutrality come from conservation, then the other half will have to come from changing to clean (nonemissions-generating) energy sources.

82% of campus energy comes from Abbott Power Plant, which burns coal and natural gas to create steam to heat buildings and generate electricity. The remaining energy needed is purchased from the regional electric



### What does cutting down our emissions look like?

**FIGURE 2:** 2015 iCAP wedge diagram. The upward slope shows possible emissions levels if we do nothing. Each colored wedge shows an example of the reduction in emissions that might be achieved by proposed technologies and strategies. No matter what the real mix of actions will be, every campus effort makes a little wedge, and many wedges are needed to get to zero.

grid, which includes substantial contributions from burning coal and gas. By generating energy differently on campus, and by buying energy from low-carbon sources (wind, solar, etc.), campus can eliminate a large portion of its carbon footprint.

Goal: Decrease greenhouse gas emissions by 30% by FY20. Future goals: 40% reduction by FY 2025, 50% reduction by 2030, 75% reduction by 2040, and 100% reduction by 2050.

In 2014, the campus had achieved an 11% total decrease, mostly due to improvements in energy efficiency.

Objectives:

5. The Energy Generation, Purchasing, and Distribution SWATeam, in collaboration with Facilities & Services and topical Consultation Groups, will lead an exploration of options for 100% clean campus energy during FY16, and submit recommendations through the [formal sustainability process](#). Clean energies to be explored include:
  - » Geothermal heating and cooling.
  - » Air-source heat pumps.
  - » Biomass replacement for coal.
  - » Solar Photovoltaics and Solar Thermal.

6. Expand on-campus solar energy production. By FY20, produce at least 12,500 MWh/year, and by FY25 at least 25,000 MWh/yr, from solar installations on campus property. These targets represent 5% and 10% of expected 2050 electricity demand, respectively.
7. Expand the purchase of clean energy. By FY20, obtain at least 120,000 MWh/yr, and by FY25 at least 140,000 MWh/yr from low-carbon energy sources. These targets represent 48% and 56% of expected 2050 electricity demand, respectively. Some options:
  - » Power Purchase Agreement (PPA) – a contract with an energy generator promising our purchase. Our promise of payment may allow them to expand generation, knowing they will have funds to rely on.
  - » Renewable Energy Certificates (RECs) – The energy in the grid is mixed, coming from both renewable and non-renewable sources, and it's impossible to “unmix” it so that campus can buy only the renewable energy. Renewable Energy Certificates confirm a certain amount of renewable energy was added to the grid, and their purchase could allow us to make specific claims about our use of renewable energy.
8. Offset all emissions from the National

# 28,000:

The Urbana-Champaign campus' total annual energy consumption could power 28,000 average American households for 1 year.



Petascade Computing Facility (and other successor facilities) by the next contract from the National Science Foundation. See more on offsets on pages 4 and 5.

### 3) TRANSPORTATION

Instead of decreasing emissions 30% from transportation by 2015, the campus actually *increased* its transportation GHGs by 30%. Although commuting and fleet emissions have decreased 6% and 3% respectively, reported air travel emissions increased 52%. This figure may not represent an actual rise in number of miles flown, but may be a reflection of better tracking of this information (we may have underestimated our time in the sky in the past). Because air travel is often necessary to fulfill the campus' mission, it cannot be totally eliminated. Instead, the campus will consider purchasing carbon offsets.

Goals: Return emissions to FY08 level by FY20 (reversing the 30% increase). Then achieve additional 15% reduction by 2025, 75% reduction by 2030, 90% reduction by FY40, and 100% reduction by FY50.

Objectives:

9. Reduce air travel emissions from a new FY14 baseline 25% by FY20, 50% by FY25, and 100% by FY30.

10. Reduce emissions from the campus fleet by 20% for departmentally owned and carpool vehicles by FY20. Suggested steps:

- » Phase out old fleet vehicles and introduce low-emission models or electric vehicles.
- » Install anti-idling equipment and idling-tracking equipment on all vehicles. We want to know how long vehicles are running but not doing anything. Turn 'em off!

11. Conduct a detailed study by the end of FY17 to develop scenarios for complete conversion of the campus fleet to renewable fuels.

12. Reduce the percentage of staff trips made using single occupancy vehicles from 65% to 55% by FY20, 50% by FY25, and 45% by FY30.

- » Encourage car-free commuting with less-than-full-time parking (so you can pay just to park during winter when you can't ride your bike) or closer parking spots reserved for low-emission vehicles.
- » Guaranteed Ride Home – in case of emergency, employees will receive a free ride by taxi to get to home/hospital/daycare quickly.
- » Expand Zipcar service usage.
- » Install more electric vehicle charging stations.

» Communicate opportunities for CUMTD and carpooling.

13. Implement the [Campus Bike Plan](#) on the schedule noted in that plan. Notable deadlines include full implementation of new bikeway facilities by FY25, bike parking within 150 feet of every building in the core of campus by FY20, and bike rentals by FY20.

14. Appropriately staff sustainable transportation efforts, especially through the hiring of an Active Transportation Coordinator.

### 4) WATER AND STORMWATER

Water and energy are linked in complicated ways. Water is used in energy generation, and energy is in turn needed to extract, clean and move water. Reducing campus' energy, water, and materials use at the same time is most effective and insulates campus from potential negative circumstances such as drought, spikes in energy prices, etc.

Campus uses 20% of local water demand, and all this water is coming from aquifers that must serve everyone in Central Illinois. Despite an increase in population, campus decreased its water usage by 23% from 2008 to 2014.

Goals: 1) Reduce water consumption by



30% by FY20. Future goals: 40% reduction by FY25, 45% reduction by FY30, 50% reduction by 2040, and 60% reduction by 2050.

2) Capture 25% of stormwater for use as nonpotable water needs by FY20, 40% by FY25, 50% by FY30, 75% by FY40, and 90% by FY50.

Objectives:

15. Obtain and publicize more specific water use data by FY16, including water quantity and quality data where available. Reports should include not only total water use, but also per capita and per square foot.
16. Improve the water efficiency of cooling towers by limiting the amount discharged to sewer to less than 20% of water intake for chiller plant towers, and less than 33% for stand-alone building towers by FY20.
17. Perform a water audit to establish water conservation targets and determine upper limits for water demand by end-use (laboratory, kitchen, restroom, etc.) for incorporation into facilities standards by FY16.
18. Inventory and benchmark campus' existing landscape performance by FY17.



**“We are convinced that our campus has both the intellectual capacity and the determination to rise to this challenge.” (2015 iCAP)**

Does it capture water and let it seep into the soil, or allow it to run off? The inventory would report locations where native landscaping, no-mow zones, no-irrigation zones, etc. are feasible.

19. Through an open solicitation process, implement at least four pilot projects to showcase the potential of water and/or stormwater reuse by FY20, with the objective of implementing a broader program by FY25.
20. Investigate the water quality impacts of stormwater runoff and potential ways to reduce stormwater pollutant discharges by FY18.

## 5) PURCHASING, WASTE, AND RECYCLING

Waste on campus comes in many forms: animal waste from the south farms on this campus, landscape waste from trimmings, and municipal solid waste (MSW) – the stuff that you put in a trashcan. In FY14, we diverted 85.6% of these wastes from the landfill, but most of it was the animal waste and landscape. Of the stuff in the trashcan, only 31% was diverted in FY14.

However, what did go to the landfill is making fewer emissions than before. As garbage decomposes, it releases methane, a potent greenhouse gas. Some landfills, like the one in Danville that our campus uses, captures this methane and burns it for energy. Even though we sent 14% more trash to landfill in FY14 than in FY08, it still registered as an emissions decrease.

Although there are many campus programs working to decrease our municipal solid waste (trayless dining halls, zero-waste sporting events, nitrile glove recycling, lab chemical reuse program), there is certainly room for improvement. For example, in FY13, 71% of paper used had no recycled content, and while campus does have procurement codes, they go unenforced where environmental products are concerned.

Goals: Because efforts to increase recycling and reduce waste fall mostly to individuals, campus must create a comprehensive Zero Waste Program to raise awareness, effect behavior change, and enforce policies for

purchasing environmentally friendly products. Objectives:

21. By FY17, environmental standards will be applied to purchases of office paper, cleaning products, computers, other electronics, and freight/package delivery services. At least 50% of purchases in these categories will meet campus standards by FY20, and 75% by FY25.
22. Reduce MSW going to landfills. Campus will increase the diversion rate of MSW to 45% by FY20, 60% by FY25, and 80% by FY35, while also increasing the total diversion rate to 90% by FY20 and 95% by FY25. MSW sent to landfills should decline to 2,000 tons annually by 2035.
  - » Reduce nondurable (use once and throw away) purchases.
  - » Reuse materials.
  - » Raise recycling rates across campus with awareness created by waste characterization studies, events, and information campaigns.
  - » Increase availability and visibility of recycling bins.
  - » Expand recycling categories (glass, Styrofoam, etc.)
  - » Require recycling of construction and demolition material (a component of LEED ® certification).
23. Utilize landfills with methane capture.
24. Appropriately staff Zero Waste efforts through the hiring of a full-time Zero Waste Coordinator.

## 6) AGRICULTURE, LAND USE, FOOD, AND SEQUESTRATION

Food production, land management and food services – which are enormous undertakings on our 9.9-square-mile campus – deserve consideration for their environmental impacts even though these impacts are often less clear-cut than those of energy or water. GHGs are produced from campus farms' agricultural production, processing, transportation, marketing, consumption, and food waste. Ice and snow removal, mowing, and other garden maintenance on campus requires equipment that emits GHGs, too. Meanwhile, the plants we grow using this equipment take carbon out of the air – making for a constantly shifting emissions level.



The limited scope of calculating tools and lack of reported data on fertilizer, pesticide, tillage and other agricultural practices makes gauging emissions from land use difficult. More expertise is certainly needed to understand our campus' agricultural emissions.

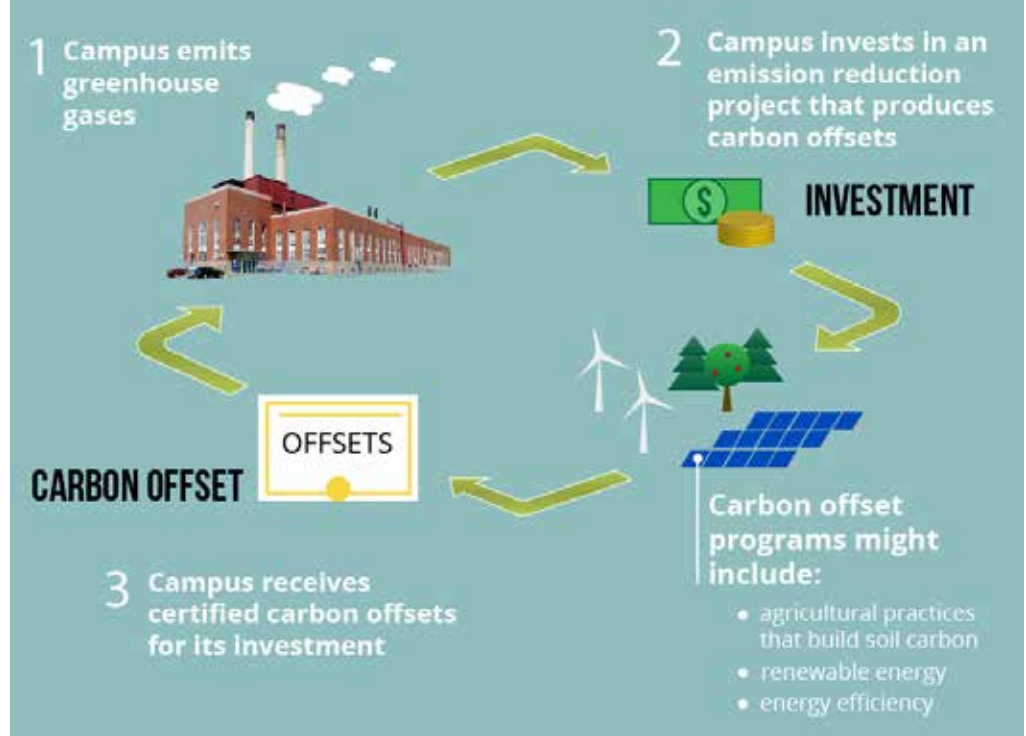
As of FY14, ag emissions decreased 24%, bringing campus close to its 2020 goal of 30% reduction.

Goals: Reduce agricultural emissions by 30% by FY20, 50% reduction by FY25, 70% reduction by FY30, 90% reduction by FY40, and 100% reduction by FY50.

Objectives:

25. Perform a comprehensive assessment of GHG emissions from agricultural operations, and develop a plan to reduce them, by the end of FY16.
26. Design and maintain campus landscapes in a more sustainable manner: expand the specification of sustainable plantings in campus landscaping standards, develop and implement a tree care plan by FY16, and an develop an integrated pest management program by FY17.
27. Incorporate sustainability principles more fully into the Campus Master Plan.
  - » This is in progress. Revisions could include designating space for renewable energy generation, guidelines for open space/sustainable planting, and reconciling the need for new program space with the net-zero growth space policy.
28. Implement a project that examines the food service carbon footprint for Dining and other on-campus food vendors, while increasing local food procurement to 40% by FY25.
29. Increase carbon sequestration in campus soils by determining the sequestration value of existing plantings and identifying locations for additional plantings, with a specific objective of converting at least 50 acres of U of I farmland to agroforestry by FY20.
30. Reduce nitrates in agricultural runoff and

FIGURE 3: Carbon Offsets Process



subsurface drainage by 50% from the FY15 baseline by FY22.

## 7) CARBON OFFSETS

In certain circumstances, it is impractical or not financially viable to reduce greenhouse gas emissions entirely to zero. For example, while there is certainly room to reduce the amount of air travel conducted by campus employees by encouraging the alternative of videoconferencing, there is some travel that is essential to our campus' mission. To handle such circumstances, the concept of a carbon offset has been developed. Carbon offsets allow the exchange of carbon emission reductions through a financial transaction. See how this works in the diagram in Figure 3.

Objectives:

31. By the end of FY16, conduct a Request for Proposals process for verified carbon offsets, and undertake our campus' first purchase of offsets.
32. By the end of FY17, develop an administrative mechanism to enable

campus units to voluntarily purchase carbon offsets.

33. By the end of FY18, develop a program of local or regional mission-linked verified carbon offsets. Rather than relying exclusively on the purchase of carbon offsets from international markets, the campus will develop local community offsets that are linked to our institutional missions.
34. By FY20, utilize offsets to meet all iCAP emissions targets that have not been met by direct emission reductions.

## 8) FINANCING

All of the programs, facility maintenance, and upgrades proposed thus far in the 2015 iCAP are supported by a variety of sources:

- » Campus utilities budget.
- » Energy Performance Contracting – using cost savings from reduced energy to pay off the initial investment. Requires an upfront debt.
- » Deferred maintenance – a student fee dedicated to funding maintenance that was previously needed, but couldn't be done due to lack of funding.
- » Central campus budget – one-time allocations for individually approved projects.
- » Student Sustainability Committee – student fee supported \$1.1 million to grant each year to sustainability projects proposed by students, faculty, and staff.

**“As one of the leading research institutions in the world, it is imperative for the campus to practice responsible stewardship of the natural resources it utilizes.”** (2015 iCAP)



- » Revolving loan fund (RLF) – Established in FY12 to pay upfront for projects and then is reimbursed by utility savings (energy, water, materials).
- » External grants.
- » Private donations.
- » Sale of carbon credits – In FY15, our campus sold carbon credits to Chevrolet, which retired them on behalf of the environment, in order to support emission reduction projects.

To learn more about each of these sources, please refer to the [complete 2015 iCAP](#).

Goals: Ensure all the best ideas for reducing our greenhouse gases can be realized.

Objectives:

35. By the end of FY16, develop criteria and a review process for the iCAP Working Group to allocate funding for feasibility studies of SWATeam-recommended sustainability projects and initiatives, using funds provided by campus administration and other sources.
36. By the end of FY16, increase the size of the Revolving Loan Fund to a level commensurate with our aspirational peers, expand the reach of the Fund, and increase the use of Energy Performance Contracting.
37. By the end of FY16, identify the amount of funds that are available across campus for projects that do not offer a rapid financial payback, but which are nevertheless important for improving campus sustainability, and identify options to increase that amount annually.

38. By the end of FY16, evaluate the feasibility of internally putting a price on carbon emissions.

- » There are real costs associated with emitting carbon into the atmosphere, but the campus doesn't currently pay them. The campus could choose to "charge itself" for those costs, and use those funds to support emission reduction projects or to purchase carbon offsets. This would provide individual units with a financial incentive to reduce their emissions.

## 9) CURRICULAR EDUCATION

Our campus is committed to educating future leaders to address the most pressing issues facing society today. Our goals for students who earn a degree at the University of Illinois at Urbana-Champaign are expressed by these six sustainability learning outcomes:

### *Day-to-day life*

- » Students will learn ways in which natural resources are used to produce what they consume, such as the food they eat, the water they drink, and the energy they use.
- » Students will understand ways in which their lifestyle and wellbeing are interconnected with those of diverse producers and consumers around the world, including impoverished communities.

### *Knowledge and skills*

- » Students will learn core concepts of ecology and develop skills relevant to their chosen field to provide a basis for environmental sustainability.

- » Students will learn to think holistically about sustainability using perspectives across multiple disciplines.

### *Personal vision*

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

Objectives:

39. Offer an undergraduate minor in sustainability starting with approximately 20 students in 2016 that will provide in-depth learning about the three dimensions of sustainability and enable students to make connections between the different disciplines to solve problems related to sustainability. The Institute for Sustainability, Energy, and Environment will coordinate this program.
40. Offer opportunities for undergraduate students to obtain research and practical experience by participating in independent study projects on topics in sustainability.
41. Add at least five new sustainability-focused courses by FY20, and revise current class curriculums to include sustainability aspects. A [sustainability course inventory](#) is available on the iSEE website.

## 10) OUTREACH

In addition to the learning opportunities in the classroom, Illinois is proud to offer a wide variety of co-curricular programs for students to get involved in the sustainability field.

Goal: All students, faculty, staff, and community members should be informed and have ample opportunity to participate in sustainability efforts.

Objectives:

42. Support and communicate about co-curricular student sustainability programs, including RSOs, the Student Sustainability Leadership Council, and the Student Sustainability Committee.
43. Strengthen and communicate about sustainability outreach programs. Specifically, at least half of the full-time campus staff will be participating in the Certified Green Office Program by FY20.
  - » Campus and community outreach programs include: iSEE's Certified Green Office Program, the Urbana-

Champaign Energy Star Challenge, Champaign County Sustainability Network, the Scholarship of Sustainability Seminar Series, Campus Conservation Nationals, and more.

- » Work with local governments to create a Metropolitan Climate Action Plan – a plan that aligns the sustainability goals of the U of I, Champaign, Urbana, and CUMTD.
  - » Provide a directory of Illinois faculty and staff willing to be sustainability speakers and expert sources.
44. Organize and promote three major sustainability events on campus each year: Earth Week, Campus Sustainability Week, and the iSEE Congress.

### 11) SUSTAINABILITY RESEARCH

Illinois intends to position itself as a world leader in the area of sustainability research. The creation of the Institute for Sustainability, Energy and Environment (iSEE) is a direct result of this directive. One of iSEE's core missions is to foster actionable, interdisciplinary research to address fundamental global challenges in sustainability, energy and environment.

Three main iSEE objectives were identified to enhance Illinois' research portfolio in sustainability:

45. Create a virtual hub for the sustainability community: to develop a comprehensive online gateway for faculty, staff, students, potential donors, and all interested

parties to find information about sustainability research, education, outreach, initiatives, and operations.

- » The rebranded [iSEE website](#) serves this purpose.
46. Build connections by bringing together scholars from across campus to encourage collaboration and to enhance research endeavors.
- » Because campus is geographically large and fairly segmented in that space, many people who work on the same topic but in different units may never meet one another. iSEE's scholars programs get people together to talk about challenges and develop collaborations. [The Illinois Water Scholars](#) are already established. Other groups are coming soon.
47. Foster "actionable" research that provides real-world solutions to society's grand challenges in sustainability, energy and the environment. iSEE research themes are broken into five categories: Climate Solutions, Energy Transitions, Secure and Sustainable Agriculture, Sustainable Infrastructure, and Water and Land Stewardship.
- » 7 projects are currently funded by iSEE. Read more about the [2014 projects](#) and the [2015 projects](#).



## THE UNIVERSITY OF ILLINOIS REAFFIRMS ITS COMMITMENT

With the approval of this 2015 Illinois Climate Action Plan, our campus recognizes the urgent need to dramatically reduce its greenhouse gas emissions in order to help mitigate the dangerous effects of climate change that are already becoming evident, and more generally to continually become better stewards of our environment. We reaffirm our commitment, as part of the American College & University Presidents' Climate Commitment, to become carbon neutral as soon as possible, and we look forward to the possibility of accelerating our climate efforts and setting a goal to attain carbon neutrality considerably sooner than 2050. In doing so, we aim to lay the groundwork for the continued excellence of the University of Illinois, for the next 150 years and beyond.

– 2015 Illinois Climate Action Plan