**Illinois Climate Action Plan (iCAP) – FY13 Progress Overview**

MBJ/SML 04/22/2014

**Signed University Commitments:** American College and University Presidents’ Climate Commitment (ACUPCC), signed 2/22/2008. Illinois Climate Action Plan, signed 5/15/2010. Illinois Campus Sustainability Compact, signed 8/27/2010.

**iCAP Project Goal:** The iCAP is a living document that is now represented by the [iCAP Portal website](http://icap.sustainability.illinois.edu). The goal is to meet the various sustainability focused commitments on campus, to position the University of Illinois as a global leader in sustainability. There is a basic numerical goal of reaching carbon neutrality by 2050; however, the purpose is primarily to educate the world’s future leaders (Illinois graduates) and “walk the talk” on our campus, with leadership from the Institute for Sustainability, Energy, and Environment.

**Sustainability Themes:** The myriad of sustainability programs and projects around campus are categorized into ten sustainability themes. These are Education, Energy, Funding, Land & Space, Outreach, Procurement & Waste, Reporting Progress, Research, Transportation, and Water. Many projects impact more than a single theme, so they are listed on the iCAP Portal under a primary theme, with additional themes noted as applicable. There are over 200 sustainability projects currently in progress. The following is a summary of key initiatives.

**Education:** Education initiatives include both academic course modifications and communicating about campus sustainability efforts.

* The Institute for Sustainability, Energy, and Environment (iSEE) has provided a teaching workshop for instructors to help them integrate sustainability into their courses. In just three years, the workshop has produced approximately 80 courses modified to include sustainability that have the potential to reach 10,000 students.
* An inventory of sustainability courses and programs has been created that students find useful to identify courses by certain categories. If a student is looking for a sustainability course that fulfills a general education requirement, it is documented on iSEE’s website. In addition, the courses are divided into undergraduate and graduate courses. The course inventory identified more than 250 courses offered by 43 departments. Primary gaps in course offerings are in the humanities and social sciences.
* Sustainability Learning Outcomes: Illinois is committed to educating future leaders to address the most pressing issues facing society today. The institute has worked through faculty groups of diverse disciplines to develop Sustainability Learning Outcomes for Illinois Graduates. These six learning outcomes involve teaching students to consider sustainability in day-to-day life, to acquire sustainability knowledge and skills, and to embrace sustainability as a personal vision.
* Scholarship of Sustainability Series: Further, the institute sponsors the Scholarship of Sustainability Series: The Human Place in Nature. The series is open to all—faculty, staff, students, and the public. Students can participate in the series for credit by enrolling in any of the five courses connected to the series. This ten-week series is an in-depth investigation of the seminal literature surrounding sustainability. Attendance in the weekly sessions averages in the hundreds.
* Illinois recently joined Coursera to offer Massive Online Open Courses (MOOCs) free of charge to anyone with internet access. The Introduction to Sustainability course had over 30,000 students sign up the first year.
* The communications effort led to the iCAP Portal database as a resource for anyone interested in learning details about sustainability programs.
* There are also numerous events and messages that bring people together to talk with the sustainability staff and advocates on campus and in town.
* Develop an interdisciplinary 2-semester research seminar for grad students – not addressed
* Education Task Force: During calendar year 2010, a Sustainability Education Task Force worked to develop recommendation for enhancing sustainability on our campus. The recommendations from this task force include 1) Develop and implement a strategic action plan for educational aspects of sustainability; 2) Encourage development of courses and programs to fully address learning outcomes and gaps in campus educational offerings; 3) Develop a campus-wide interdisciplinary doctoral fellows program for sustainability.
* The Campus Strategic Plan from 2013 included the strategy to make this campus a Living Learning Laboratory. To that end, the Civil and Environmental Engineering (CEE) department worked with F&S to develop a Project Based Learning course, CEE 398 PBL. This course connects students to campus and community professionals, to address sustainability-related projects. The first semester was Fall 2013 with 14 students. The next semester in Fall 2014 will scale up to about 40 students, and the long term plan is to make this course part of the regular curriculum for CEE students.

**Energy Conservation:**  The iCAP goals are 20% energy reduction from building utilization, excluding Petascale, by FY15, 30% by FY20, and 40% by FY25. F&S has made a lot of progress on this through Utilities & Energy Services and some departments have contributed through energy conservation efforts in their facilities. Centrally managed energy conservation projects with quick payback (from six months to 5-10 years) are regularly identified, funded, and implemented. After these projects are completed in any particular location, there are typically increased preventive maintenance needs and additional projects identified that are often underfunded.

Additionally, energy conservation efforts need to expand into behavior change efforts, with stronger cross-campus support of the conservation efforts. The initial steps in this effort include the energy consumption reports provided to each college, the Energy Conservation Incentive Program (ECIP), real-time energy displays online, and student energy conservation competitions such as Campus Conservation Nationals (CCN).

* Retrocommissioning (RCx) – Multi-disciplinary teams work through high energy-use buildings to re-commission the buildings, with an emphasis on HVAC systems and Controls and temperature setbacks (often referred to as “scheduling”). Each year, buildings are selected from the top 100 energy consumption buildings. By the end of FY13, the RCx teams completed 40 buildings, with an average of 26.5% energy reduction since beginning the program in FY08. In total, RCx efforts reduced energy costs by over $14M. RCx leaders are now reaching out to auxiliaries, such as McKinley Health Center, to identify funding.
* The 2010 iCAP noted that the RCx teams should revisit finished buildings every 5 to 8 years to maintain the energy savings. To address the need to modify building maintenance procedures to support long term energy savings, a new energy-focused Preventive Maintenance team is going into the first RCx buildings with composite crews. The preventative maintenance keeps the equipment well maintained to extend the life, avoid future repair cost by eliminating equipment failures, or keep such failures within limits. This work over time will reduce the maintenance backlog and drive down maintenance expenses while limiting degradation of energy savings achieved by Retro Commissioning and EPC projects.
* Lighting Retrofit (T-12 to T-8) – With support from F&S, grant agencies, individual departments, the Student Sustainability Committee, and the campus, 118,567 fixtures had been retrofitted by the end of FY13, saving 19,425,042 kWh/year. This program involves grant applications, prioritizing locations, and managing the design, implementation, and tracking aspects. The campus funded fixture retrofits are very close to completion; however, there are several T-12 fixtures in departmentally funded areas on campus, such as large equipment like walk-in refrigerators. Departments with T-12 fixtures need to be informed of the requirement to replace these fixtures, so that the transition can be fully completed.
* In addition to replacing T-12 fluorescent lights, there are many other types of luminaires throughout campus, including incandescents, compact fluorescents, and high intensity discharge (HID) fixtures, such as metal halide, mercury vapor, and high pressure sodium. Many of these are being replaced with LED fixtures. There is an opportunity to develop a crowd-source system for locating old lighting fixtures throughout campus.
* LED Campus – Chancellor Wise committed us to being an LED Campus on the 50th anniversary of Dr. Holonyak’s demonstration on campus of the first visible LED. She said “This will make us the first LED university campus in the United States, with interior and exterior wayfinding fixtures to be replaced by 2025 and with the majority of all lighting to be LED by 2050.” F&S is working with the Parking Department to upgrade various parking lots to be LED, with the consideration of energy efficient bi-level lights. Additionally, Exit signs in various buildings have been upgraded to LED exit signs (these are the interior wayfinding fixtures). Currently, we do not have a tracking system for LED installations, at the campus-wide level. There have been numerous small installations of LEDs, large capital projects with LEDs, and the exit signs and parking lot installations. We need to create a campus-wide tracking system for these installations.
* Deferred Maintenance Energy Projects – The AFMFA project selection committee had life safety and energy conservation as top priorities for project selection for a few years. Projects that have a positive impact on energy use for campus are noted as such on the Deferred Maintenance website. The majority of these projects were envelope repair projects. This program also provided initial funding for RCx and the Lighting Retrofits.
* The 2010 iCAP included a recommendation to do basic simple weatherization of campus buildings, via maintenance. To support this effort, the F&S Building Maintenance team worked with teams of students from various sustainability-related groups to identify weatherization needs in six small houses on campus. The results showed a decrease in the typical energy demand for electricity and natural gas. Typical electricity use for all six buildings together declined 23% comparing the average consumption in FY10 and FY11 to the actual consumption in FY13. This included non-weatherization efforts such as consolidating refrigerators and turning off computers at night. There is still the need for a campus-wide effort to install weather stripping on the majority of entryways for all campus buildings.
* Pipe Insulation and Steam Trap Maintenance – F&S has two full-time pipe insulators working through the campus buildings to reduce energy loss in maintenance rooms, and two pipe fitters to replace steam traps. Also, contractors have been hired, on a case by case basis, to insulate steam distribution lines, identified by energy distribution personnel. In FY12, 61 buildings had pipe insulation, saving 154,078 therms of energy that year. One therm is equivalent to 100,000 BTU. A lot has been accomplished through this initiative, and there is a lot more to do. Also in FY12, steam trap maintenance was performed on over 750 steam traps throughout campus, saving an unmeasured amount of steam energy.
* Occupancy and Daylighting Sensors – Sensors can be helpful for both lighting conservation and HVAC load reduction. There have been many installed with past funding efforts through grants and the Student Sustainability Committee (SSC). In FY08 and FY09, the SSC provided funding to install 562 sensors, saving an estimated 251,800 kWh/year. Currently, a project is in design to install sensors in 21 buildings with funding from the Revolving Loan Fund.
* The 2010 iCAP included the recommendation that, by 2025, any new buildings should be net energy neutral or net energy providers. The initial attempt at this concept is nearing completion with the Net-Zero Energy Electrical and Computer Engineering Building (ECEB). This high-profile project is primarily the responsibility of the Department of Electrical and Computer Engineering. During the design and construction of this building, it became apparent that there are many ways to define net-zero energy. In this case, the sum of the building’s anticipated energy demand over the course of a year will eventually be approximately equal to the annual energy provided by the proposed renewable energy generation on site and on the associated parking deck. At this time, there are still funding needs for solar panels on both the building roof and the North Campus Parking Deck to achieve the desired energy generation. It is also important to understand that a net-zero energy building still relies on the campus energy supply at various times during the year.
* Energy Performance Contracts (EPC) – To date, two EPC projects have been completed with expected energy cost avoidance totaling $2M annually. A long-term plan has been developed for 18 buildings with a series of EPCs. These efforts are focused primarily on research facilities which have large energy demands. The first contract associated with the plan is expected to address five buildings with an EPC under contract by early FY15.
* Fume Hoods – F&S tracks the Fume Hoods that are in use around campus. The number of fume hoods cannot be unilaterally reduced across campus because of the life-safety requirements for various research efforts. When life-safety compliance can be met without the hood, fume hoods have been decommissioned or mothballed. In 2010, there were 1,725 chemical fume hoods on campus, of which 58 were mothballed. At the end of FY13, there were 1706 hoods, with 67 mothballed. Additionally, older fume hoods have Constant Air Volume fans, which are being replaced with Variable Air Volume fans through individual upgrade projects. The replacement of the fans is not centrally funded. There was also a helpful “shut the sash” educational campaign which needs to be revived and expanded throughout campus.
* Energy Dashboard – This project has a Sustainability Fellow to design a business plan for implementing real-time energy displays across campus. The students working with this professor will install a pilot version in the College of Business, assess the best implementation method, and provide recommendations to F&S by summer 2014. They are looking at how best to use the technology to gain behavior change from building occupants. The dashboard technology will also be used in student energy conservation competitions, such as Campus Conservation Nationals.
* Energy Conservation Incentive Program (ECIP) – This program was launched during FY14, and the award winners were notified of their winnings on Campus Sustainability Day, Oct. 23. There have been individual building award presentations with multiple representatives from each building to discuss the use of the awarded funds, and promote the energy conservation message. The 2010 iCAP recommended billing energy use to colleges and empowering them to decentralize billing to the department level. This was aimed both to incentivize energy conservation and to spread awareness of energy consumption patterns at the college and unit level.
* F&S is now providing energy billing information to each college on a monthly basis through the Energy Billing System (EBS). Facility managers receive energy consumption and cost information through the web-based EBS and its metering, billing, and reporting components. EBS allows units to evaluate the impact of changes in building heating, ventilation and air conditioning (HVAC) programming, including time-based calculations or building-to-building comparisons, on energy usage.
* Campus buildings are typically controlled by either a pneumatic or electronic system that is operated and maintained by F&S Systems & Controls. This group includes the Direct Digital Control (DDC) Programmers, the DDC Electricians, and the Temperature Control Mechanics. A significant effort is underway to update the existing control systems to current standards, improving efficiency and the building environment. The 2010 iCAP included the recommendation to construct a direct-digital control command center to monitor temperature control, and this center is complete. The increased efficiency of energy use for campus will continue to improve through the upgrades of controls systems to DDC options.
* The 2010 iCAP also recommended all of the following practices, and these are being incorporated into projects on campus, where appropriate: Use instantaneous and semi-instantaneous hot water heaters; convert CAV reheat to VAV; eliminate summer steam usage; use variable speed drives for fans and pumps; green and white roofs: and building energy requirements; Utilize recovered heat from chiller condensers and other sources.
* Replace desktop computers with thin client computers. Reduce and consolidate computer server installations. Use technologies such as Wake or LAN to allow computers to be turned off at night but still maintained at night. – status unknown
* Use standards more aggressive than Energy Star for appliances. – status unknown

**Renewable Energy:** The iCAP goals are 5% renewable electricity by FY15, 17.5% by FY20, and 25% by FY25. The iCAP also commits to “end coal usage at Abbott Power Plant by 2017.” It lists the following to do items (in italics), which have various statuses as described below.

* *“Install at least three utility-scale wind turbines on the south campus, with a minimum of one to be installed by 2011” –* This was attempted, and cancelled in 2011 by the Board of Trustees. The Wind Turbine on South Farms was originally suggested in 2003, by the Students for Environmental Concerns. The Illinois Clean Energy Community Foundation agreed to support the project with a $2M grant in 2005. In December 2008, Chancellor Herman cancelled the project due to campus funding issues. The following year, calendar year 2009, the faculty and staff at Illinois were furloughed, due to lack of campus funds for payroll. In 2010, the iCAP included the wind turbine project, and the grant from ICECF was extended. In spring 2011, all studies were complete, and funding was allocated to support a single utlity-scale wind turbine on the South Farms. The Board of Trustees subcommittee decided to disapprove the project, under pressure from the local community.
* *“Increase the amount of solar photovoltaic and thermal projects.” and* “*Install solar photovoltaic (PV) arrays on 250,000 m2 of campus roofs, with a goal of 25 MW peak generation capacity and 45 million kwh of electricity.”* In addition to the previously existing 33 kW array on the Business Instructional Facility, there are building projects which may incorporate roof top solar PV arrays, including residence halls, KCPA, and future LEED certified buildings. There are a few research related solar arrays, for example the 15 kW array at the Building Research Council, but these are not installed specifically to address the campus energy demand. For energy production purposes, the largest project is the forthcoming Solar Farm, with a capacity of 5.88 MW. Additionally, there is one solar thermal project, installed on the roof of the Activities and Recreation Center (ARC).
* *“Purchase off-site green energy if on-site renewable projects are not sufficient to meet the [Illinois Renewable Portfolio Standards]” –* Between FY10 and FY13, no renewable energy credits were purchased for campus. The wind turbine and solar efforts were pursued. With the low quantity of renewable energy currently generated on campus, the campus leadership is investigating options for purchasing renewable energy credits (RECs) for 5% of the anticipated electricity use in FY15 to meet the first iCAP renewables target.
* *“Cease all investment that will enhance or increase the lifetime of the coal-fuelled systems at Abbott Power Plant” –* To produce steam heat for campus, there are both coal fired boilers and natural gas fired boilers. With this recommendation from the 2010 iCAP, F&S focused on improvements to the natural gas boilers, rather than overhauling or replacing the coal boilers.
* *“Commission a detailed study by 2012 that examines campus energy generation and distribution systems; specifically tasked with eliminating coal use and distributing thermal energy more efficiently (bot water distribution, regeneration, geothermal use).” –* Master Plan for Energy Production and Distribution – F&S is working with a consultant and sub-consultants to develop a planning tool that will provide results for various potential energy use scenarios. The scenario tool can be used to evaluate potential energy use and production options for campus. This will allow for a cross-campus consensus to be built around the iCAP goals for renewables, coal use, space limitation, and energy conservation.
* *“Upgrading Abbott Power Plant to be able to co-fire with biomass, possibly with a circulating fluidized bed boiler, must be given serious consideration.”* – The potential for using biomass at Abbott has been examined from a few directions, including an evaluation of the cost and emissions impact of moving to biomass, based on the example of Eastern Illinois University. A biomass boiler was also pursued at the Vet Med complex, with funding from ICECF. However, this project lacked a reasonable methodology for the field to flame logistics, bringing the miscanthus from the fields at the Energy Farm on South Farms to the combined heat and power biomass boiler at Vet Med. Currently, in FY14, a project is in design to install a biomass boiler at the Energy Farm to heat the two-story greenhouse at that site.
* “*Pilot methane capture project at Beef and Sheep Farm by 2015. All manure from South Farms should be converted to methane in a digester and routed to Abbott, and the byproduct can replace nitrogen and phosphorous fertilizer.” –* A feasibility study for an Anaerobic Digester at the Beef and Sheep research facility was initiated in 2012. At the kick-off meeting for this study, it was determined that the Beef and Sheep facility manure is too inconsistent over time to be a reliable feedstock for an anaerobic digester. The study was therefore expanded to include all reasonably available animal waste, landscape waste, and food waste from campus. The most recent draft report from this study is currently under review.

**Funding Commitments:**

* Energy Performance Contracts – F&S is working to establish a plan for additional Energy Service Contracts, to benefit from this useful implementation methodology.
* Revolving Loan Fund (RLF) – This fund was developed in partnership with the SSC, to provide up-front cash for energy and water conservation projects, to be paid back over time from the utility cost avoidance. We are seeking suggestions from Facility Managers to be evaluated by the AFMFA committee.
* Student Sustainability Committee (SSC) – This committee allocates over $1M per year toward campus sustainability projects. They have just received the initial inquiries about potential projects for round one of two they will do this year. F&S reviews the proposals to help guide their implementation and make notes about feasibility. The SSC had previously avoided our input, but they value our assistance now.
* Seek External Grants – The majority of energy conservation grants are from the Illinois Department of Commerce and Economic Opportunity (DCEO), and the largest grant is handled by the Retrocommissioning team, under Karl Helmink. Other grants include the Food Scrap grant, the Boiler grant, and funding from the Illinois Clean Energy Community Foundation (ICECF). As of the end of FY13, over $12M in grant funding has been received and used by campus for sustainability programs.
* Donor funding – The Baum Family Foundation contributed $2M in support of the Institute for Sustainability, Energy, and Environment.

**Land and Space Commitments:**

* Space Limitation – The iCAP committed campus to incorporate a “no net increase in space” policy by 2012. This policy will have a very high impact on the Energy Master Plan. There are two committees discussing the possibilities for this need. Jill Maxey is the point of contact for this in the Division of Management Information. There were 20,113,569 Gross Square Feet (GSF) in FY08 and 20,908,187 GSF in FY13. That is an increase of 794,618 GSF, or 4%.
* An effort to demolish old buildings, identified by facility assessments as not worth renovating, was under taken. From FY08 to FY13, 53 buildings were razed. At the end of FY13, five more buildings were in the queue to be demolished.
* The 2010 iCAP included the recommendation to identify short term sustainable landscape projects and implement a sustainable landscapes plan. As of the end of FY13, there were numerous areas around campus which have incorporate native plant species. These species provide much needed habitat for pollinators and assist with carbon sequestration. This includes the 2.8 acre prairie restoration at the corner of Florida and Orchard, two prairie areas at the Vet Med complex, native woodland plants at the Natural Resources Building, as well as other locations throughout campus.
* LEED Certification – The Facility Standards require that every large capital project achieve LEED Gold certification. iCAP includes the commitment to require LEED Platinum certification for any project planned after 2015. However, there are discrepancies between the LEED Platinum requirements and the state building codes. These discrepancies are under review by F&S. Additionally, there has not been a decision made about whether it is appropriate to require LEED Platinum projects for campus. That is an open item for discussion.
* Incentivize sustainable and organic practices on campus agricultural lands. This has not been addressed; however, there are efforts to slow the impact of non-point source pollution from South Farms.
* The Research Park on campus is a unique area for this campus, developed in partnership with the City of Champaign, and coordinated with the university through a developer agreement. The 2010 iCAP recommendation is to modify the developer agreement in the future to incorporate the principles of the iCAP. In June 2010, the Executive Director of F&S said, “As UA negotiates the next UIRP agreement I suggest that the goals of the Climate Action Plan be considered and where appropriate incorporated into the development agreement.” To which the Vice President for Technology and Economic Development replied “Yes agreed. We have already discussed this conceptually with developer. If you have specific examples or issues let me know.”
* Purchase at least 30% of food from local sources within 100 miles by 2015. – in progress through Housing
* Develop and promote a “local foods network” and innovative production options. – in progress through the County Board

**Outreach Commitments:**  While the iSEE has led the efforts for this, F&S has played a significant role in communicating about the iCAP progress and needs. The iSEE is responsible for organizing Sustainability Week and supporting Earth Week each year, yet many events include representatives from F&S. For example, the Fall 2013 planning team included the Bicycle Coordinator, the Waste Management Coordinator, and the Sustainability Coordinator. Additionally, F&S has historically been responsible for the communication at the staff level with our community partners, such as Urbana, Champaign, MTD, and the Regional Planning Commission.

* U-C Energy Star Challenge – The City of Urbana has led the movement to start an Energy Star Challenge in partnership with the local utility and the Environmental Protection Agency. Our campus can participate both with student volunteers helping local businesses participate in the energy conservation program, and by providing energy consumption data through the online website. Students will be recruited during Sustainability Week and Morgan will meet with UES in early November to determine a reasonable level of direct campus participation.
* Sustainability Week and Earth Week – We participate in the Sustainability Expos, through the Campus Bicycle Shop, and with specific events such as the Sustainability Awards Ceremony on Oct 23.
* iCAP Portal – To provide information about the existing, proposed, and historical projects. This has a tracking system for logged in users and a public system for interested community and campus members. It is continually updated.
* Supporting Campus Green Teams – This needs additional efforts at organization. There are many teams that are working toward sustainability throughout campus, and the campus needs to facilitate communication between the teams, support additional teams, and provide existing teams with mechanisms for success. For example, a team recently asked how to reduce energy consumption at a deeper scale than “turn off the lights.”
* Energy Liaisons – This initiative was organized by F&S, and identified key contacts for energy conservation efforts throughout campus. In FY09, approximately 100 people across campus were identified as energy liaisons. F&S sent news letters to these staff, and worked with them to promote energy conservation and awareness with tables and displays in 10 campus buildings in FY11. Due to lack of funding, the program was discontinued in FY12.
* The iCAP recommended using the F&S Energy liaisons and various campus sustainability committees as grassroots contacts for campus sustainability initiatives. The sustainability staff routinely reached out to the known sustainability focused groups on campus and in the community to share ideas and information about campus sustainability programs.
* The Eco-Reps Pilot program - at Housing
* CCNet – to share information and build relationships with the community
* Public engagement, corporate relations
* Researchers database in the iCAP Portal – online for Water Researchers
* Student projects off-campus: Encourage student efforts in community in energy efficient projects, like weatherization for low-income homes, via illinicarbon, Students for Environmental ConcernS (SECS)

**Reporting Progress:** The iSEE regularly completes surveys and applies for sustainability awards for campus.

* The Campus Strategic Plan tracking system could be used for regular review, critique, and accountability of progress on campus sustainability goals. The energy information currently tracked in this system is available online at <http://dmi.illinois.edu/strategicplandashboard/>.
* Create and share a recurring annual report for iCAP/sustainability – STARS, GHG, etc. – available online

**Research:** The ISEE will facilitate advanced research in sustainability.

* The Sustainability Fellows program is designed to engage faculty throughout campus in the sustainability efforts occurring with the existing and future infrastructure on campus. The goal is to help create a living learning community where faculty and students can become involved in an open-innovation ecosystem related to campus buildings, land, and energy.

**Transportation:** The iCAP commitments for transportation include charging a greenhouse gas fee for all vehicles on campus, approving and implementing the Campus Bike Plan, starting bike sharing on campus, and creating a system for voluntary greenhouse gas offset purchases for business air travel. The greenhouse gas emission fee for vehicles is not possible, so we are encouraging fuel efficient and electric vehicles instead.

* Transportation Demand Management – This is an ongoing effort from F&S to reduce single-occupancy-vehicles on campus. This is possible through an ongoing effort to encourage walking, biking, and transit use, and do traffic-calming with narrowed roadways, low speed limits, and high-visibility crosswalks.
* The Illinois Biodiesel Initiative worked with Housing Dining Services and F&S to collect waste vegetable oil, convert it to biodiesel, and provide the biodiesel for the campus fleet vehicles to use. This program was interrupted in 2012, and has not yet been reinstated.
* The campus fleet has increased the use of alternative service vehicles over the last decade, and they are now used in various areas, including these units: Mail Distribution, Project Coordinators, Parking Enforcement, Generator Service, Locksmith shop, and the Plumbing shop. By the end of FY13, the campus car pool included three hybrid Prius cars, and two hybrid Volts. Additionally, the idling from campus fleet vehicles has been tracked and efforts are ongoing to reduce idling and the associated emissions.
* Electric Vehicle Charging Stations – The SSC has allocated funding to install a public use charging station in the North Campus Parking Deck. The Parking Department is also looking at options for implementing public use charging stations at key locations throughout the University District.
* Zipcar – Each Zipcar vehicle removes about 15 single-occupancy-vehicles from the road. The Campus Area Transportation Study (CATS) partners brought Zipcar to this area, and there are currently ten Zipcars. These are normal fuel-efficient cars that are used by the hour for round-trips only. They are highly successful on campus, and new UI affiliated memberships are approved daily.
* Campus Bike Plan – The bike plan outlines an overall master plan for encouraging mode-shift to bicycles by addressing infrastructure, education, enforcement, and evaluation topics. The plan identifies approximately $4M worth of pathway improvements needed to bring the campus bicycle network up to current national standards. There are also numerous programmatic needs, such as ongoing funding for the Campus Bicycle Center, bike parking facility improvements, recurring educational programs, and bike registration and enforcement systems. As of the end of FY13, these items were unfunded.
* Bike Sharing – There was a feasibility study completed which recommended a phased approach. A bike sharing system can be effective in encouraging mode-shift to bicycles by providing short term bikes on an hourly basis. The initial phase of this system will be departmental bikes for employee use, funded by individual departments.
* Air Emission Offsets – Institute a system for purchasing voluntary local offsets for air travel, and make mandatory by 2016. – not addressed

**Waste and Procurement:** The iCAP committed to adopting a long-term Zero Waste campus policy by 2011, and increasing waste diversion to 75% by 2020. The investigation into Zero Waste has shown that officially we have passed the 75% diversion rate, but that does not represent the original understanding which excluded animal and yard wastes.

* Waste Audits – The Illinois Sustainable Technology Center, in the Prairie Research Institute, has been hired to do detailed Waste Audits at four pilot locations around campus. These are Swanlund, Henry Admin, the Illini Union Bookstore, and the Alice Campbell Alumni Center.
* Zero Waste Coordinator – A half-time academic hourly Zero Waste Coordinator was hired in Fall 2013 to focus efforts on behavior change of individuals related to recycling and waste management.
* Sustainable Procurement – This is an area that has not been directly addressed yet for campus.
* The 2010 iCAP recommended development of a zero-waste campus policy, with incentives or fees. While the Campus Administrative Manual policy for “Recycling, Recycled Products Procurement, and Waste Reduction” refers to the iCAP, it does not yet have an implementation system for realizing the waste reduction vision. It also does not yet have buy-in from the purchasing and strategic procurement staff on campus.
* Water Fountain Retrofits – There are water bottle fillers being added to water fountains throughout campus, so building occupants can utilize refillable water bottles and reduce the use of disposable
* Commission a detailed food and non-food consumption and waste study that outlines current data, future projections, and strategies for minimizing consumption and meeting those projections with locally derived resources. – waste audits were performed by Housing
* The 2010 iCAP included the strategy to “*incorporate a large-scale food composting project by Dec 2012.*” An effort to create a large-scale food waste composting site began with a feasibility study in Fall 2011, with funding from the Office of Sustainability (now iSEE). Upon completion of the feasibility study and the food waste audits from Dining Services, a DCEO Food SCRAP grant was applied for along with funding from the SSC. A recycling assistant was hired to oversee implementation of this project, and fully develop the financial and operational business plan. However, upon completion of the business plan, it became apparent that additional funding would be needed, the operations would cost more annually than the cost avoidance from reduced landfill tipping fees, and the education/engagement aspects of composting would not be possible with the proposed system. Considering the plans for vermin-composting at the Sustainable Student Farm and an anaerobic digester on South Farms, the large-scale food waste composting project was cancelled.
* The iCAP also recommended that campus “*recycle additional items, such as glass and additional plastic categories, possibly with a bottle or can deposit program, and increase recycling rate from 50% to 75% by 2020.”* To investigate options for increased recycling, the Office of Sustainability (now iSEE) funded a graduate research assistant to report on the current recycling and waste management practices for campus. The resulting report is a detailed analysis of current practices through the end of FY12. The report includes a number of opportunities for improved waste management.
* The University Dining Services catering operation has a relatively large amount of glass bottles to dispose of each year. At the end of FY13, they started working with Green Purpose, LLC to collect and recycle the glass. This is the only existing glass recycling on campus.
* Purchasing items not yet addressed:
  + Eliminate purchase of non-recyclable material when suitable substitutes exist.
  + Charge purchasing entity (dept. etc.) costs of disposal of consumed products, and use full-cost accounting and life-cycle analysis structures for major purchases.
  + Avoid environmentally irresponsible products and corporations by using carbon indicators in coordination with other universities, with minimum recycled content standards.
  + Incorporate carbon costs into food products sold on campus.
* Property Accounting items not yet addressed:
  + Expand reuse of durable goods, through a cataloging system
  + Expand reuse of durable goods, by working for legislation to change law to allow the University to resell used goods to the public.

**Water:** The iCAP goals are 20% potable waste reduction by FY15, 30% by FY20, and 40% by FY25. As of FY12, we had met the FY15 goal.

* Connect the Raw Water System – This was specified in the iCAP for potable water reduction, but it has not been thoroughly evaluated at this time. There should be a cost/benefit analysis completed for this project. It is likely going to be more financially feasible in the future as potable water costs increase.
* Leak Assessment – F&S completed a leak assessment of the existing potable water distribution system and has been working to address the leaks.
* Low flow fixtures – These are used on a regular basis now.
* Green Stormwater Infrastructure – F&S staff are working with the community partners to maintain compliance for stormwater quality and quantity from campus. One effort includes the Storm Drain Murals. Another effort includes a Sustainability Fellow, evaluating the impact of different types of stormwater infrastructure on the spread of mosquitos.
* Campus projects for green infrastructure include the construction of green roofs. The Business Instructional Facility contains a green roof that involves plantings on part of the roof area to reduce rain run-off and the impact of heat on the building heating, ventilation and cooling systems. These plantings were specifically chosen because of their regional use and ability to thrive without irrigation or fertilizer. There are also green roofs installed on the Yeh Center, the Forbes Natural History Building, the Art and Design Building, and the long-term installation on KCPA.
* In FY2011, cooling towers constituted 30 percent of the total water use on campus. Due to the large water use of these towers, a ‘True Cost of Water Study’ was performed with the goals of benchmarking water use in cooling towers and generating ideas for improving water use efficiency. The study was conducted by the Illinois Sustainable Technology Center in collaboration with F&S and was funded by the SSC. In addition to identifying methods to reduce water usage for cooling towers, this study recommended options for using non-potable water on campus. Further investigation is needed to prioritize these non-potable water usage projects and begin implementation on campus.
* The 2010 iCAP recommended that campus “*include true cost of water in energy billing system.”* The water usage by building is now included in the online EBS reporting system, just like energy usage information. The cost is defined by the utility rates posted online at <http://www.fs.illinois.edu/docs/default-source/Utilities-Energy/utilities-rates.pdf?sfvrsn=0>. These costs include water supply costs, personnel costs, operations and maintenance costs, repair and replacement costs, distribution costs, and related debt service. The definition of “true cost” of water needs to be clarified.
* Construct tile-drainage wetlands built at 5% wetland-to-watershed to reduce nitrate-N into Embarras

River by 50%. – not addressed