Preliminary Report on Progress Towards iCAP Goals

February 25, 2014

Ben McCall

Associate Director for Campus Sustainability

Institute for Sustainability, Energy, and Environment

As an initial step in assessing our campus’s progress towards the iCAP goals, we have identified those specific targets listed in the iCAP with dates on or before FY 2015. For the purposes of this document, we refer to these targets collectively as the “2015 Targets:”

1. Reduce energy consumption for existing buildings by 20% from FY08 baseline
2. Reduce GHG emissions for existing buildings by 15% from FY08 baseline
3. Satisfy 5% of campus electrical energy needs from renewables
4. Reduce GHG emissions from transportation by 30% from FY08 baseline
5. Purchase 30% of food from local sources
6. Reduce potable water usage by 20% from FY08 baseline
7. Implement a “no net increase in energy due to building” policy
8. Develop a long-term Zero-Waste policy

This document summarizes our progress on each of these eight “2015 Targets.” Four of them (colored in green) have been reached or are expected to be reached. Two of them (#7 and #8, in orange) can be reached through the implementation of new policy without requiring an explicit financial commitment. Reaching goals #3 and #4 (in red) will require a new financial commitment of order $100,000/year.

1. Reduce energy consumption for existing buildings by 20% from FY08 baseline

We consider building energy consumption to be represented by the sum of electrical power either purchased or generated on campus and steam produced on campus. For the ease of reporting, we interpret “existing buildings” to mean all buildings on campus in a given fiscal year, with the sole exception of the National Petascale Computing Facility. Petascale is excluded because an explicit iCAP target is to offset its GHG impacts when the next contract is negotiated.

In FY08, total building energy consumption was 448,526,674 kWh of electricity plus 2,418,864 MMBtu (or 708,727,152 kWh) of steam, for a total of 1,157,253,826 kWh. In FY13, total building energy consumption was 464,733,308 kWh of electricity (minus 79,643,431 kWh for Petascale) plus 1,697,118 MMBtu of steam (or 497,255,574 kWh), for a total of 882,345,451 kWh. For existing buildings as defined here, this represents a decrease of 23.8% from the FY08 baseline. We therefore consider this goal to have been met.

1. Reduce GHG emissions for existing buildings by 15% from FY08 baseline

For the purpose of evaluating this target, we consider the CO2 emissions from the electricity (generated and purchased) and the steam generated, as described in section 1. In FY08, CO2 emissions were 302,194 tons from electricity and 188,688 tons from steam, for a total of 490,882 tons. In FY13, CO2 emissions were 306,915 tons from electricity and 122,401 tons from steam. As 17.1% of our electrical usage was for Petascale, we remove this fraction of the CO2 emissions from electricity, to reach a total of 376,833 tons for FY13. This represents a 23.2% reduction from FY08, so we therefore consider this goal to have been met.

1. Satisfy 5% of campus electrical energy needs from renewables

As of FY13, campus electrical energy consumption (excluding Petascale) is 385,089,877 kWh. Our renewable electricity target is then 5% of this quantity, or 19,254,494 kWh, or 19.25 GWh. Although an average of 13% of the electricity on the regional grid originates from renewable energy sources, the environmental benefits of the renewable energy are sold separately from the electricity itself in the form of Renewable Energy Credits (RECs). As the campus has been purchasing electricity only, and not RECs, we cannot claim any of our purchased electricity as being renewable.

At the time of this writing, the only significant renewable energy production on campus is from the 40 kW solar array on the Business Instructional Facility (BIF), which produce approximately 0.04 GWh. A solar PV “farm” on the South Farms is planned, which is estimated to produce 7.86 GWh, and this facility is not expected to be operational by FY15.

In order to meet this iCAP target, the campus needs to either enter into a power purchase agreement for 20 GWh per year of renewable energy, or purchase RECs in an equivalent quantity. The most economical approach appears to be purchasing RECs, which currently cost ~$1-2/MWh. To meet our target with RECs, we therefore anticipate an annual expenditure of ~$20,000-40,000. Reduce GHG emissions from transportation by 30% from FY08 baseline

Carbon emissions from transportation include those from air travel, commuting, and fleet vehicles. Between FY08 and FY13, emissions from fleet vehicles decreased from 5,564 tons to 5,028 tons, and emissions from commuting decreased from 11,324 tons to 10,339 tons. However, emissions from air travel increased from 27,354 tons to 32,264 tons (an 18% increase). As a result, our total transportation emissions increased from 44,242 tons to 47,631 tons (an overall 8% increase). From FY13, a reduction in emissions of 16,662 tons will be required to meet the 2015 target.

In order to meet this iCAP target, the campus will need to purchase offsets for approximately half of its air travel. At an estimated offset cost of $5/ton, this would require an annual expenditure of roughly $80,000.

1. Purchase 30% of food from local sources

Dining Services has aggressively pursued options for procurement of locally produced and/or processed foods, and before the drought of 2012 they purchased about 28% of their food from local producers or processors. They expect to be able to exceed the 30% iCAP target before 2015.

1. Reduce potable water usage by 20% from FY08 baseline

The campus used 1,312,492 kgal of potable water in FY08, and 1,038,783 kgal in FY13, which is a 20.9% reduction. We therefore consider this goal to have been met.

1. Implement a “no net increase in energy due to building” policy

While informal efforts in this direction have been made in some colleges, there is no campus-wide policy on this issue at the present time. iSEE staff has recently been discussing this issue with the Campus Non-Instructional Space Task Force, with the aim of having a formal policy in place before 2015. The ideal policy would require no net increase in square footage or energy usage due to construction of new buildings or major renovations of existing buildings. Develop a long-term Zero-Waste policy

A half-time campus Zero Waste coordinator has recently been hired at Facilities & Services, but no long-term policy has been developed. The Zero Waste Coordinator is tasked with developing the policy, in cooperation with iSEE staff and other stakeholders.