Student Evaluations of Ten UIUC Sustainability Projects in NRES 285, and Recommendations for Student Sustainability Committee

Warren G. Lavey (Adjunct Professor, NRES and SESE)

May 12, 2014

Student Evaluations of Ten UIUC Sustainability Projects

In March through May 2014, ten undergrads in NRES 285 chose to evaluate a variety of UIUC sustainability projects. All of the projects selected were supported by financing from the Student Sustainability Committee (SSC).

1. Solar photovoltaic system on BIF
2. Solar thermal system on ARC
3. Solar photovoltaic system and electric vehicles at Sustainable Student Farm (SSF)
4. Wood-burning furnace at Allerton Park
5. LEDs at Krannert Center for the Performing Arts
6. Green roof on Art & Design
7. Vermicomposting at SSF
8. Red Oak rain garden
9. Prairie garden at Vet Med
10. Bike shop

The students were guided to ask questions about the effectiveness of the projects. The objective was to develop evaluations of how well the projects achieved the relevant goals and what could be learned from these actions.

The students’ work started with research on the relevant technologies and evaluations of similar actions. Next, the students interviewed Facilities & Services (F&S) and other staff involved in these UIUC projects, visited the sites, and reviewed data collected by staff. The students’ presentations to the class and final papers addressed topics such as:

* defining relevant performance metrics (financial costs and savings; effects on greenhouse gas emissions; other environmental impacts; student involvement; communications of results; other)
* considering which measures were monitored and what estimates could be applied when actual measures were missing
* applying life-cycle analysis
* looking for indirect effects
* analyzing the effectiveness of a project in terms of the relevant goals
* developing practical recommendations for better monitoring and evaluation
* developing recommendations for improving a project or designing future projects

Each student made substantial progress in evaluating her or his chosen project. While the papers have shortcomings and in some cases errors, the students’ papers can be useful in further analyses of these and other projects. The papers are being provided to UIUC’s Associate Director of Sustainability.

Among the findings from the students’ work are:

* some projects were simply not monitored or evaluated in any way after their implementation, even when the proposal for SSC funding included a commitment to monitoring
* some projects are monitoring certain aspects of their operations, but missing important financial and environmental metrics which would be practical to add
* some projects are falling far short of the performance described in the proposals to SSC
* some projects required or could benefit from substantial revisions to the designs described in the proposals to SSC
* some projects require changes in utilization in order to achieve desirable returns on investment
* some projects could more effectively communicate their impacts, including life-cycle and indirect benefits, and increase student involvement
* some projects should consider additional types of costs when presenting analyses of their financial returns
* some projects should consider additional types of impacts on emissions, energy use, landfills, and other resources when presenting analyses of their environmental effects
* some projects are likely achieving significant benefits according to estimates based on studies of similar actions, but failure to collect relevant data at UIUC reduces the learning from such projects for UIUC students and staff

Recommendations for the SSC

The efforts and findings from this NRES 285 course support the following four recommendations for SSC review and funding of projects:

1. Each funded project should be monitored and evaluated, with annual reports to SSC for at least the first three years after implementation. SSC should post these reports on its portal.
2. Each proposal to SSC should provide a set of performance metrics relevant to the project’s goals (financial, environmental, communications, and other) and commit staff time and other resources to collect and report the relevant data for at least three years after implementation.
3. Each proposal to SSC should present an analysis of the performance of similar projects at UIUC.
4. SSC should form a new sub-committee of students with a focus on project evaluation.
   1. Duties of the sub-committee
      1. Work with staff to develop annual reports on projects post-implementation
      2. Critique for the SSC sub-committees charged with reviewing proposals the proposals’
         1. description of performance metrics
         2. analysis of the performance of similar projects at UIUC
      3. By analyzing the project evaluations, initiate discussions with staff on potential proposals to improve or extend projects.
   2. Supervision by a faculty member, possibly for course credit