

Green Campus: Innovative approaches to energizing the “Next Generation” toward energy efficiency and green behaviors

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Abstract

The Green Campus program was designed to tackle the problem of how to best to deliver energy efficiency services in public universities. The campus setting is an environment in which: 1) students use energy but do not pay bills or see the savings from energy efficient behaviors 2) students may be more willing to listen to advocates their own age rather than “experts” or their elders 3) participants can be approached with “green” lessons, and provided education that will guide choices into the future – leading to long term energy savings and 4) few programs have been designed or delivered.

The program used an innovative approach – employing part time student interns on campuses – to deliver information, education, programs, and activities that brought the message of energy efficiency and other green practices to university campuses in the US. This program has been in place for three years and has spread to 12 campuses. This paper presents key elements of the program’s design, summarizes the activities that were most successful (including residence hall challenges, Energy 101 classes and other methods), identifies program difficulties, provides information on savings, and provides lessons for others considering introducing a program to influence young adults. The program’s benefits are expected to be immediate and hopefully carry on for a generation.

Introduction

The Green Campus Program was developed by the Alliance to Save Energy (ASE, The Alliance), a non-profit energy efficiency organization based in Washington, DC, with input from California Student Sustainability Coalition (CSSC). Skumatz Economic Research Associates (SERA) was selected to evaluate this program. The program was designed to build on the success of ASE’s Green Schools Program, adapting the program to the University level. The program is described in detail on the ASE’s website (www.ase.org/section/program/greencampus). The goals of the program are to:

- Save energy on university campuses through a student-led campaign to identify and reduce energy waste.
- Build student awareness about the relationship between energy efficiency and the environment and the need to use energy efficiently; and
- Strengthen academic learning by facilitating the incorporation of Green Campus activities into student academic plans.

The program’s design capitalizes on a flexible intern-led approach, which provides several key advantages.

- On-campus student interns can identify activities and programs that are most appropriate to the needs of their campus. This can represent their own creative efforts as well as adaptations of programs that are successful at other campuses. This approach avoids cookie-cutter program designs that will likely be less successful than a tailored design that responds to the “local” university situation

- On-campus interns have better access to administration, facility staff, student buildings, and students than outside contractors or entities ever would. Students are the “clients” of the university.
- A student run program capitalizes on the energy and idealism of the student population, and “taps” the power of some of the most capable, premier students in California to lead to changes in energy using behavior among students as well as university staff and faculty.
- Students can have more influence over their peers, and can use approaches that will resonate most with other students.

Campuses were selected based on a number of criteria, with variations that help illustrate the program’s relative potential and performance in different settings. The nine California participating campuses at the time of the evaluation are: California State University campuses at: Humboldt, Sonoma, San Bernardino, and Chico; San Diego State University; and the University of California campuses at: Berkeley, San Diego, Santa Barbara, and Irvine.¹

Evaluation Efforts

To conduct this evaluation, interviews were conducted with various stakeholders and members of the program staff. In addition, more than 350 surveys were administered to random sets of students in the first year, and almost 1,300 in the second year. The Year 1 student surveys were conducted at the end of the year, asking about changes in behavior, attitudes, and other issues from the beginning to end of the year. In the second year, separate beginning of year and end of year surveys were conducted, increasing the number of total surveys conducted. The survey distribution design included selecting random residence halls and random floors within the residence halls. Surveys were provided to residential hall assistants (RAs) to distribute to each resident on their floor. The surveys were collected by the interns. On some campuses, Ipods were provided as possible prize drawings to encourage survey returns (which was successful); on other campuses no drawings were held. Key findings and recommendations from the evaluation are summarized below.

Awareness of Green Campus: One of the Green Campus program’s strengths has been to increase students’ awareness of energy conservation measures. Student interns have been hard at work for two years trying to raise awareness on the campuses and have experienced considerable success in their effort. More than 70 % of the students reporting responded that they were aware of the programs, mainly through flyers and posters. Two years of surveys indicated that, of these efforts, posters, Green Campus program information, and flyers/brochures were the most successful media items in terms of students taking notice. Also successful were the incentive programs such as the free CFL bulb give-away, intern-designed energy saving “challenges” between residence halls or student groups, and classes on environmental or energy conservation issues. Students re-

ported they were not as likely to notice rebate coupons, Energy Star® promotions, pledge cards, and emails or listserv on energy conservation or Green Campus. The survey also found students reported those outreach methods that would garner the greatest response and energy-related action on their part. Residence hall advisors also played a significant role in passing information on Green Campus across to the students.

Appliance Saturations in On-Campus Housing: Overall, the data showed a trend of using more energy efficient appliances and using less of standard efficiency appliances. Computers are leading the way, and CFLs have also been making inroads. With devices such as free light bulb give-a-ways, students’ awareness of CFLs increased to about half of the student body by the end of the year. Encouragement of CFL usage has been one of the most successful aspects of the Green Campus program. The data showed that while students did not purchase an overwhelming amount of Energy Star equipment throughout the year, the energy efficient equipment they did purchase was due to the influence of the program.

Energy Related Behavior and Attitudinal Effects from Green Campus: Students were asked how frequently they carry out energy related / conservation behaviors. Participation in events to increase awareness of energy conservation was a more difficult area in which to involve students. Other than enrollment in an environmental class, interest was relatively low. The results showed some penetration of Green Campus-encouraged behaviors, including purchase of CFLs, turning off computers overnight when not in use, lower use of heaters, and other behaviors. Figure 1 shows the percent change of student behavior throughout the school year. It shows that in almost all of the categories, a higher percentage of students participated conservation behavior at the end of the school year, and in many categories, such as *look for energy tags or purchase Energy Star® CFLs for your room*, the change in behavior was very positive.

In addition, they were asked about their attitudes about energy efficiency and their ability to affect the environment and broad societal changes (“self-efficacy”). The results show how the program can raise awareness on campus and shape student opinions. By affecting the students on campus they can then take this knowledge on with them as they graduate and move throughout the country. Figure 2 represents the changes of opinion throughout the school year of the students on all nine campuses. The table shows the percent change of how strongly the students agreed or disagreed with the behavior statements. It displays that the Green Campus program has an influence on the behaviors and opinions relating to efficacy of the students. The behaviors that are in bold, are those that are “good” from a conservation standpoint and vice versa. The figure shows that for all of the “good” conservation related behaviors more students agreed with the statements at the end of the year than the beginning, and for the “bad” statements, fewer students tended to agree with them at the end of the year, based on the survey responses.²

1. The program will be expanding to three more campuses, specifically University of California at Merced, at Santa Cruz, and the Cal Poly Pomona campus.

2. The analysis is pre-post. The program did not have budget to compare to select or survey possible “control group” universities.

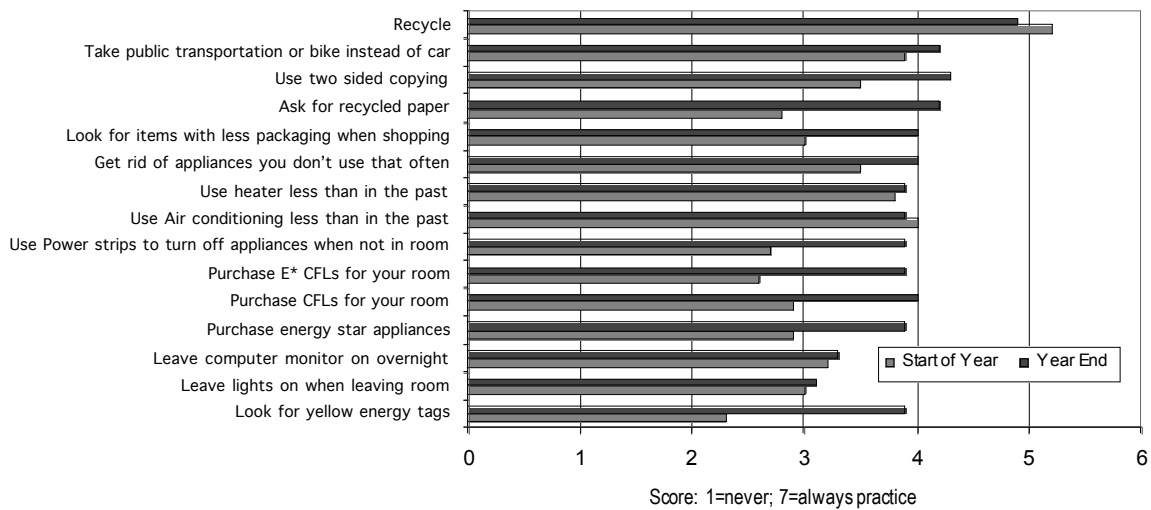


Figure 1. Conservation-Related Behavior Changes before and after Green Campus Program

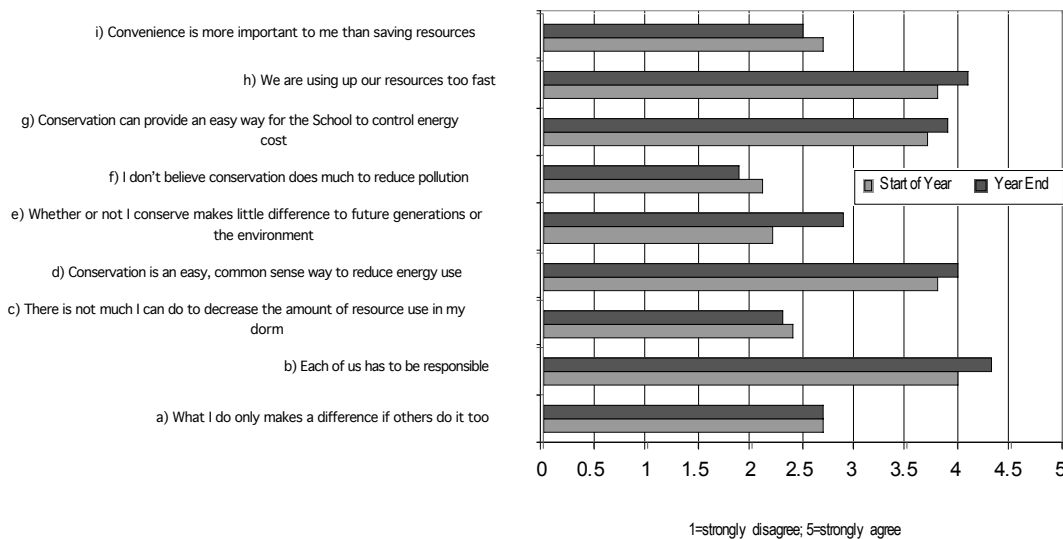


Figure 2. Program Effect on Attitudes and Self-Efficacy Related to Energy Use

NON-ENERGY BENEFITS

The survey provided indicative feedback on whether students recognize non-energy benefits associated with the program-encouraged energy efficiency measures. Non-energy benefits (NEBs) are the range of effects, *beyond energy savings*, that are associated with installation of energy efficiency equipment versus standard efficiency equipment. Figure 3 displays the responses for positive and negative non-energy effects using a scale from -2 to 2, where -2 is a negative value to the benefit and 2 is positive. The results show positive perceptions of efficiency equipment, especially related to their ability to help the environment, and provide improved equipment performance, reliability, quality of light, and other advantages. The second year survey saw students return a positive response in all categories of non-energy benefits. Again, students noted environmental impacts as a key non-energy benefit associated with energy efficient equipment and appliances. The Green Campus program can positively affect the overall student body opinion relating to the non-energy effects of various conservation measures.

Design Innovations

A key element in the program design is the innovative intern led approach. During the interview process of the program stakeholders both on and off campus, the overwhelming response was that the interns were integral in the program success. Nearly every respondent reported that the student-led approach was critical to the Program's success. Allowing the students to run the Program has allowed the events to be more enthusiastically received; has led to the development of many new and creative approaches; and has earned the attention of administration and faculty.

Another of the main aspects of the Green Campus program was allowing the interns to create activities and events to help address conservation issues and to raise the general level of aware among the students on campus. By having students create these activities, not university of program staff, they are able to garner greater participation on campus. The interns in the Green Campus program felt that the following activities were most successful on their campuses:

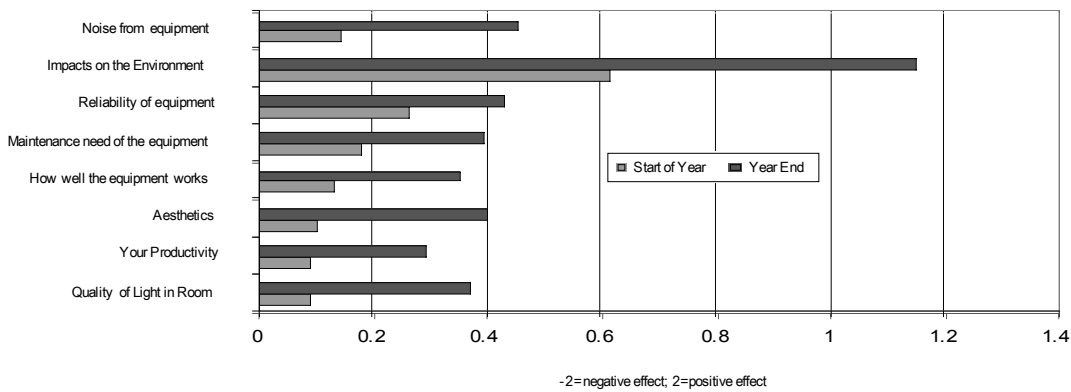


Figure 3. Student Opinions of Non-Energy Benefits of Energy Efficient Equipment

- CFL bulb exchanges & give-a-ways.
- “Blackout Battles,” competitions between dorms on who can decrease their light usage the most.
- Providing incentives for students demonstrating conscientious behaviors.
- Awareness days: At these events, interns passed out CFLs, displayed hybrid cars, sponsored a visit from the Edison Energy Star® Bus, and served lunch and distributed raffle prizes. They also passed out education and Energy Star® pamphlets plus their own pamphlets.
- Energy Star® product list: The interns created a list of Energy Star® products that dorms, students, and residents usually use (televisions, DVD players, cordless phones, etc.). To create the flyer, the interns researched where they could get them close to campus.
- Eco-Trivia: The trivia game competition included environmental questions on energy efficiency.
- Green Campus end of year Hawaiian style party/luau: The interns teamed up with the visual arts department on campus and did a “Pull-the-Plug” –themed art competition. In addition, Redbull® came out in support, and the energy trivia game was also used at the event.

Program Challenges and Lessons Learned

Although the overall design and implementation went well, interviews indicate that there were a few difficulties that the program needed to alleviate. The staff turnover inevitable in a college environment slowed implementation somewhat, but the program developed strategies to institutionalize the knowledge gained by the interns. Flexible financial controls were developed to help assure interns had funds needed to purchase program materials. Most importantly, the program found continuation and expansion relies on high quality intern training, documentation of program delivery and procedures, and a high quality communication channel among interns, as well as with program staff.

Measurement of decreased energy use is vital to the success of any such program and it can help assure stakeholders that the program delivers impacts in return for funding. The Green

Campus program developed a number of strategies to address the measurement issue.

- **Make measurement – and training on measurement – a focus with interns.** The emphasis on setting up / planning measurement plans for all intern programs is important, and measurements of pre/post or baseline should be an integral part of the plan.³
- **Institutionalize measurements of awareness and behavior change:** The best way to measure changes in these “hard to measure” effects is through student surveys.
- **Procure additional meters to address the kWh measurement issue:** To help overcome this problem, consider grants, utility funding, and other methods to obtain additional meters – and not just submeters at the building level, but purchase less expensive in-room plug load meters as well.

LESSONS LEARNED

Although the program has only been evaluated for the last two years, SERA and the ASE staff have found a number of steps that could assist others that are considering introducing a program to influence young adults, especially in a university setting. Some of these lessons are:

- **Honor the Program Manager / Intern Coordinator role:** This go-between between the program and interns has proven to play a pivotal role in intern hiring, coordination, motivation, training, enforcement, and other roles.
- **Where possible, attempt to hire second- or third-year students as interns to improve continuity.** Hiring students in their last year of education reduces retention of interns and increases training needs.
- **Consider leveraging on-campus facility staff to assist in directing interns:** It is important in implementing a program that relies heavily on students that a balance is developed between intern direction/supervision and encouraging

3. Before the program began, baseline measures were attempted on several campuses, but the degree of disaggregation of meters on campus precluded the program from getting building by building energy use data. The program is investing in specialized meters that can be placed in rooms or at building levels; those were not available for the first two years of the program evaluation work.

the interns creativity and flexibility to sculpt the program to the individual campus.

- **Where possible, integrate the student residence hall assistants (RAs) into the program:** RAs were very valuable in helping achieve program goals on the nine campuses studied. Their close relationship with first year students, the focus their job has on delivering programs and services to students, their help in res hall competitions; assistance in handing out promotional information, and the valuable service they performed in helping deliver and retrieve program surveys demonstrates they can be a key element in successful delivery of such a program.
- **Provide in depth training for interns:** To successfully implement a student led program training on effective measurement methods is beneficial – including principles of baseline, control groups, and measuring “hard to measure” (behavioral, attitudinal) impacts.
- **Meetings, and other communication / training opportunities:** Strong and open lines of communication can assist persons beyond the interns, particularly helping program allies, feel up to date and connected to the program.
- **Incorporate facility managers as a key program ally:** Facility managers can provide training to interns and guide / focus intern activities “on the ground”. Their interest and cooperation in the program can help leverage the program’s influence to hard, long lasting energy savings in a wide range of campus buildings. If not courted, they can be an impediment to the program, stymieing measurement efforts and close off the mentoring role that can be critical to success for some interns.⁴

4. These professionals were involved in the program in the first two years; their involvement is expected to increase in the coming years.