Changing Energy Behavior Through Community Based Social Marketing

Cynthia McPherson Frantz, Bridget Flynn, Stephanie Atwood, Daniella Mostow, Cecilia Xu and Sarah Kahl

Abstract

Achieving carbon neutrality on college and university campuses will require more than just new technologies. Behavior change programs are a highly cost effective method of reducing costs and carbon emissions; however most facilities and sustainability offices lack training in the social science of behavior change. This paper introduces readers to Community Based Social Marketing (CBSM), a systematic, empirically grounded approach to behavior change. A team of faculty, staff, and students used CBSM to develop the behavioral component of Oberlin College's Climate Action Plan—targeted to eliminate 10–15 % of the College's carbon emissions. After analyzing the College's Greenhouse Gas Inventory we identified a short list of behaviors associated with significant carbon emissions to target for further study. Quantitative surveys, qualitative focus groups, and field observations were used to collect baseline data on these behaviors, as well as to identify the key barriers to changing them. Two behaviors were targeted for initial intervention: turning off lights in unused classrooms, and using cold water for washing laundry. We developed interventions using insights from our survey results as well as insights from behavior change research, and conducted two field studies to evaluate their effectiveness. This paper concludes with a discussion of lessons learned and suggestions for the implementation of CBSM research programs at other institutions. The approach described here is replicable at other institutions. It also provides students with an engaging real world context in which to learn and practice basic research skills, thus furthering a core curricular goal of higher education.

C.M. Frantz (✉) · B. Flynn · S. Atwood · D. Mostow · C. Xu · S. Kahl
Department of Psychology, Office of Environmental Sustainability, Oberlin College, 120 W. Lorain St., Oberlin, OH 44074, USA
e-mail: cindy.frantz@oberlin.edu

W. Leal Filho and M. Zint (eds.), *The Contribution of Social Sciences to Sustainable Development at Universities*, World Sustainability Series,
DOI 10.1007/978-3-319-26866-8_16

Keywords
Climate neutrality · Behavior change · Education · Research skills · Conservation · Community based social marketing

1 Introduction: Behavior Matters

As hotbeds of scientific understanding, progressive ideas, and student activism, colleges and universities around the world are leading the charge against climate change. In the United States alone, nearly 700 college and university presidents have signed the American Colleges and Universities Presidents' Climate Commitment (ACUPCC), and are setting ambitious timelines for achieving carbon neutrality. Changes in energy sources and infrastructure upgrades are critical to these efforts; however carbon neutrality will require more than just new technologies and fuels. The adoption and proper *use* of new technologies, as well as energy conservation and curtailment, are essential for achieving carbon neutrality. In other words, people will need to change their behavior.

The systematic attempt to change energy-related behavior on college campuses benefits multiple stakeholders in a variety of ways. In comparison to investments in infrastructure improvements or technology shifts, behavior change programs are remarkably inexpensive. They directly contribute to carbon neutrality goals by helping to minimize both avoidable and unavoidable carbon emissions (and thus also minimize the purchase of carbon offsets). They typically also reduce utility costs, creating benefits to those who must pay the bills and balance the budget. If students are involved in the process of developing and assessing these programs, they become a valuable pedagogical tool for furthering the educational mission of the institution. In addition, they have the potential to have a broader cultural impact as faculty, staff, and students learn new behaviors on campus that may spill over into their behavior elsewhere. This is particularly true on residential campuses, where many students are living away from home for the first time, and are forming habits they are likely to carry with them for the rest of their lives. Thus behavior change programs do not simply affect what happens on campus; they are an important piece of creating a broader cultural shift towards sustainability.

However these benefits only accrue if the behavior change programs are successful—and not all of them are (e.g., Geller 1981; Midden et al. 1983; Hirst 1984). The social sciences have a wealth of theories, methodologies, and insights to contribute to effective design and assessment. There is also a growing network of researchers and practitioners cataloging lessons learned and developing turnkey strategies for shifting common energy-related behaviors (to be described later). Unfortunately many facilities and sustainability personnel lack training, financial support, and/or the institutional support required to put this knowledge to use.

This paper will introduce readers to Community Based Social Marketing (CBSM, McKenzie-Mohr 2011), a systematic, empirically grounded approach to behavior change, and describe how a team of faculty, staff, and students use CBSM

to begin developing the behavioral component of Oberlin College's Climate Action Plan—targeted to eliminate 10–15 % of the College's carbon emissions. The approach described here is easily replicable at other institutions. It leverages faculty expertise and student labor to provide valuable services to Facilities and Sustainability offices working with constrained budgets and personnel. It also provides students with an engaging real world context in which to learn and practice basic research skills, thus furthering a core curricular goal of higher education.

Below we provide a brief summary of CBSM and its successes, and point readers towards resources available to support researchers and practitioners in using CBSM. We then summarize how we implemented CBSM on our college campus, describe our methodology, and summarize the empirical results of two pilot studies. We conclude with a discussion of lessons learned and suggestions for the implementation of CBSM research programs at other institutions.

2 Community Based Social Marketing: An Overview

Community-Based Social Marketing (CBSM) was developed by environmental psychologist Doug McKenzie-Mohr (2011) using principles and insights from the behavioral sciences, particularly social psychology. Historically, program designers have often selected behaviors to target and have developed interventions in a rather haphazard way, based on intuitions of what they think will work. Organizations would end up committing time and money into intensive educational workshops, media advertisement campaigns, and incentive programs that were ultimately ineffective. The CBSM approach encourages program administrators to take a systematic, empirical approach to behavior change, thereby maximizing the effectiveness of their program dollars. The method involves five steps: behavior selection, identification of barriers and benefits, strategy development, program testing, and broad-scale implementation. Effective use of CBSM techniques ensures that program administrators target high-impact behaviors, look at the broad array of factors that influence behavior (for example, social cues, self-image, local values and identities, Vigen and Mazur-Stommen 2012) and use state of the art influence tactics to design their interventions.

The first step is to determine which behaviors will have the largest impact. Three criteria are used to evaluate each behavior: its impact on the environment (e.g., amount of carbon emitted), the probability that people will change their behavior, and the percentage of people who have not yet adopted the behavior. Ideally, program dollars are focused on behaviors that are high on all three of these criteria. For example, it is highly unlikely that people would be willing to take cold showers during the winter, so it would be a waste of time to try and change that particular behavior. Similarly, a behavior such as unplugging cell phone chargers after use would not be difficult to change, but would not be very impactful because they draw so little current. Thus it would not be worth the time to try and change this behavior. Finally, if a lot of people are already participating in a particular sustainable behavior (for example, recycling plastic bottles), then

we should not waste our efforts trying to convert the few people who will not change their behavior.

The second step in the CBSM process is to identify and understand the major barriers that keep people from engaging in the targeted behavior as well as the perceived benefits of engaging in the behavior. For instance, a perceived benefit of purchasing carbon offsets may be reduced feelings of guilt while flying while a perceived barrier may be increased financial hardship. Furthermore, these benefits and barriers may by different for different subgroups within a larger population. For example, in purchasing carbon offsets, faculty and staff may have different barriers than students on a college campus because they have different financial realities.

The third step in CBSM is to develop a behavior change strategy that simultaneously addresses the identified barriers and highlights the perceived benefits of the behavior in question. An effective strategy also utilizes cutting edge psychological research on behavior change. For instance, research shows that making public commitments makes people more likely to follow through with a behavior (Sherman 1980; see Lokhorst et al. 2013, for a review). Changing norms and publicizing peers participating in sustainable behavior encourages people to change their actions because people are more likely to engage in a specific action if they see someone else doing it first (Aronson and O'Leary 1983; Goldstein et al. 2007). Prompts (e.g. reminder signs) are another effective strategy, particularly if remembering is a key barrier to performing the behavior (Houghton 1993; Smith and Bennett 1992). Finally psychological research has identified when and how to most effectively use incentives: The incentive should be directly connected to the behavior so no one is confused about the purpose and should not be too big so people still feel intrinsically motivated (Gardener and Stern 1996). It is important to note that in order for a strategy to be effective, it must be directly tied to the type barrier it is trying to address. For instance, if the barrier to engaging in a sustainable behavior is forgetting, the use of prompts will be the most effective strategy. However, if the barrier to engaging in sustainable behavior is related to public image, changing social norms will be the most effective strategy.

Two other issues are worth noting on strategy development. First, it can also be helpful to design a strategy that increases the barriers and decreases the benefits of an alternative, less desired behavior. For example, programs that make parking a car more expensive and less convenient help to change the cost-benefit analysis of riding a bike to work versus driving. Second, the perceived benefits of the target population may be quite different from the motivations of those designing the intervention. A campaign to increase biking to work may be motivated by carbon reductions, but the target population may find benefits to health a stronger motivator. The campaign should speak in the language that is most compelling to the target audience.

The fourth step of the CBSM model is to pilot and assess the effectiveness of each behavior change strategy. Due to the gaps between conception and reality, there will often be some problems with an initial behavior change strategy. The point of a pilot is to identify and address problems before investing large amounts of resources in a widespread campaign. Pilots should employ basic social science

research principles, including random assignment, a control condition, and clear quantification of outcomes.

After identifying a cost-effective and successful behavior change model, it is time for the fifth and final step of the CBSM model: widespread implementation of the intervention within the community. However, this step also involves ongoing evaluation, as new barriers can arise and old strategies can become ineffective over time (e.g., people habituate to reminder prompts). The information gleaned from evaluation can be used to refine the strategy further or to eliminate programs that are ineffective.

The CBSM approach has been used effectively all over the world to promote a wide variety of behaviors. For example CBSM was used in New Zealand to stop the spread of didymo, which is an invasive rock algae (Billingsley 2010). Didymo was starting to spread towards the north island, which poses many risks to wildlife, and threatens biodiversity. Realizing that this problem would only continue, the Ministry of Agriculture and Forestry used CBSM to identify why citizens were not taking more action against this devastating problem (Billingsley 2010).

Research into the barriers and benefits uncovered that most people were simply ignorant of the problem. They developed the CHECK, CLEAN, DRY educational campaign to address this barrier. The Ministry also partnered with other clubs in order to make cleaning equipment part of the norm for people that use the water systems, and supplied people with the cleaning materials. In 2009, the Ministry tracked their progress by surveying people in New Zealand. They found that 98 % of high-activity waterway users checked, dried, and cleaned, and a 30 % increase in the public saying they do the same. There is also evidence that didymo has slowed on both islands of New Zealand (Billingsley 2010).

CBSM was also successfully used is a Toronto-based anti-idling campaign. Motorists that were idling their engines were approached by a researcher with an information card and signs reminding motorists to turn off their engines. They were asked to make a commitment to turn off their engines when parked, and asked to place a sticker on their front windshield, which 80 % of motorists complied with. With the combination of signs, stickers, and information cards, there was a 32 % reduction in idling and over a 70 % reduction in the duration of idling (McKenzie-Mohr 2011).

Washington State used CBSM research to encourage consumers to buy recycled products. Prompts placed below products called “shelf talkers” highlighted products with recycled content to shoppers. Posters, employee buttons, and door decals also served as reminders for consumers. Stores that engaged in the study found a 58 % increase in recycled products sold, and overall, shoppers were buying 27 % more recycled content items than they had during the previous year (Herrick 1994).

Community-based social marketing works on both large scales and small, as long as the researchers take time to learn about the particular barriers and benefits of their audience and target the appropriate behaviors. The method is described in full in *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing* (Mc-Kenzie-Mohr 2011), and is available free for download at www.cbsm.com. McKenzie-Mohr also offers workshops worldwide, and maintains a

database of case studies on a wide range of sustainability-related behaviors. To read more case studies with successful CBSM projects, visit http://www.cbsm.com/cases/search.

3 Getting Started: Implementation at Oberlin

CBSM is a straightforward, systematic approach to behavior change that can be implemented in any context with relatively few resources. At Oberlin College we assembled a team made up of a psychology faculty member trained in CBSM and basic experimental design, a staff member from the Office of Environmental Sustainability well versed in sustainable behaviors as well as how the facilities and operations functions at the college, and several students with varying levels of experience with conducting research. Our budget was minimal: a few hundred dollars (US) to offer incentives for participation in focus groups and a few hundred dollars for printing signs and posters for our interventions.

Our primary goal was carbon reduction. To identify the most promising behaviors to target, we analyzed Oberlin's most recent Greenhouse Gas Inventory. The Inventory helped us identify the biggest carbon emissions source (e.g. kWhs of electricity, tons of coal, gallons of gas, miles of air travel, and their carbon equivalent). We identified every place that a human decision or behavior resulted in significant carbon emissions; this resulted in a list of over 30 potential behaviors to target with a behavior change program. For each of these behaviors, we quantified the environmental impact if the behavior was changed, the likelihood of changing the behavior, and the frequency with which the Oberlin community already performs the behavior.

The environmental impact assessment was based on the amount of greenhouse gases emitted as well as other environmental and operational costs. We researched the amount of approximate equivalent greenhouse gas emissions created by each individual behavior and applied that to Oberlin's energy mix. Behaviors with minimal impact (e.g. unplugging cell phone chargers) received a 0, while the most impactful actions (e.g. buying carbon offsets for travel) received a 4. We estimated the probability that people would adopt a new behavior using a scale of 0–4; zero being very unlikely, four being very likely. We used previous research from other universities and community programs wherever possible as a basis for these estimations. When data was not available, multiple staff, faculty, and students gave their perspectives.

To estimate how many people were already engaging in these behaviors, we used national data and information from other schools when it was available. When it was not, the research team again consulted broadly to develop an estimate, using a 0–4 scale. The final impact scores were calculated by multiplying the three scores together. The highest scoring behaviors became the focus of further research.

Prior to beginning this research, however, we sought feedback from relevant staff (representatives of Residential Education, Facilities Operations, the Center for Information Technology, union leaders) and administrators on the targeted

behaviors. This was essential for identifying unanticipated obstacles as well as for creating clear lines of communication and buy-in among people who would potentially be in positions to approve, advocate for, and/or implement proposed behavior change programs. These conversations also helped us identify those behaviors that would be relatively easy to tackle from a logistical and political point of view (e.g. encouraging the use of cold water for laundry) versus those that would require laying substantial political groundwork to make a reality (e.g. promoting carbon offsets for college travel). Inevitably, as we collected more information we modified our estimates, and the list of high-impact behaviors changed somewhat. For our first projects, we focused on those behaviors that were relatively uncontroversial and easy to get support for: turning off lights in unused classrooms, using cold water for washing laundry, and promoting biking and walking. We also sought to collect data that would help pave the way for more controversial projects (carbon offsetting).

With a short list of high impact behaviors to focus on, we began researching the barriers and benefits associated with them. We also collected data about the frequency of our targeted behaviors, to serve as a baseline against which to measure the success of future programs. This also allowed us to more accurately estimate the likelihood of changing a behavior and the frequency with which it was already in practice. We used a mix of social science methods, including quantitative surveys (administered online), focus groups, and observational research.

A random sample of faculty, staff, and students were invited via email to participate in online surveys that were tailored to that particular demographic (i.e., students were asked about laundry but faculty were not). To increase the response rate we provided a $50 raffle prize for each population group, and sent a reminder email 4 days after the initial announcement. Our response rate was 40 %. In addition to basic demographic information, we measured attitudes, motivations, and current behaviors related to energy use. We also explicitly asked participants to explain "what makes it hard" to engage in each target behavior, and "why might it be a good thing" to engage in each target behavior. These open-ended responses were content coded, and the most common themes were identified. We drew upon this information to design our interventions (described below).

We also invited a different random sample of faculty and students to participate in focus groups. Based on initial response rate, we actively recruited in certain contexts to ensure that important subgroups were adequately represented (e.g. varsity athletes, students of color). Any subgroup that might have significantly different behavioral patterns, schedule demands, cultural values, and/or needs should receive this kind of attention.

We incentivized the focus groups for students by offering $10 cash, which resulted in only a 7 % response rate. For varsity athletes the incentive was changed to a customized Chipotle burrito, and resulted in a higher response rate of 11 %. It is likely that any compensatory option that is valued but not easily accessible, off-campus food for example, would work well as an incentive for students. When we led focus groups with faculty and staff, we scheduled them at the end of the workday and during lunch. During both times, we provided the group with food

from a local restaurant, but not much of the food was eaten. It seemed like the faculty and staff were more internally motivated to attend the event than any external incentive.

In each focus group, we started by asking general questions about observations of energy use and sustainability on campus. From there, we moved into asking more detailed questions about how people felt they could reduce their energy use, what would convince others to lower their energy use, and what specific barriers were stopping them from being more energy efficient. We then asked the group about specific projects that we hoped to implement, and noted their reactions.

Finally, we observed targeted behaviors on location to see how the campus's actual behaviors related to the self-reported information collected through surveys and focus groups. For example, a team of three student researchers walked through dormitories and academic buildings at different times of day to see which central lounges, classrooms, and bathrooms had their lights on while not in use. Laundry rooms were checked to observe the settings students used for their laundry. The observations proved to be useful for several reasons. First, physically inspecting the spaces uncovered important structural barriers that needed to be considered in targeting behaviors and designing campaigns. For example, many lights in public spaces around campus are wired so that they cannot be turned off (for safety reasons). We also found discrepancies between what people reported doing (50 % of students reported they use cold water to wash clothes) and what we actually observed (0 % of running washing machines were set to cold water).

4 Testing Our Interventions: Two Field Studies

4.1 Encouraging Cold Water Washing

We identified the use of cold water for laundry as a high-impact behavior that would be relatively easy to change and currently not very common. Through focus groups, observations and an online survey, we found the main barriers that people face when trying to change their behaviors to be unclear marking to identify which button produced cold water (many machines said "bright colors" instead of cold water), habit (many students used the default setting each time they did laundry), family norms, and misconceptions about hot water cleaning clothes better. Additionally, many people were ignorant of the benefits of washing in cold water (i.e., that it helps clothes last longer), and had not thought about the environmental impact.

Our behavioral strategy used educational signs and point-of-behavior prompts to help dispel misconceptions, provide needed information, and remind people to use cold water. We created a sticker based on a project developed by the Urban Sustainability Directors Network (USDN) in conjunction with a consultant from Action Research called "Cool is Clean" (Piraino 2013). The removable stickers were adhesive and were put directly on the machines right next to or above the option

buttons, so that students had the information and reminder when they needed it. In addition to bumper stickers, we also designed posters to put in the laundry rooms. The posters stated clearly which option students should choose if they want to use cold water, dispelled myths about washing in hot water, and explained the benefits to clothes and the environment of using cold water.

We ran an observational study in three large dormitories on campus to test the change in campus behavior after the stickers were placed. Observations were made on Saturdays and Sundays, the most common days for doing laundry. During each observation, we recorded total number of machines that were running at the time, as well as the options that the users chose for their laundry. We made two observations per dorm before, and seven observations per dorm after the stickers and posters were placed. Before the stickers, none of the laundry machines observed were running with cold water (even though on an earlier survey 50 % of students self-reported that they used cold water while washing their clothes). After the stickers were in place, 45 % of the machines observed were using cold water. With a p-value of 0.04, we were able to conclude that this was a significant increase in the use of cold water.

By informing students with the posters about the benefits and providing reminders on the machines, we were able to reduce the project's main barrier: ignorance. There was a dramatic increase of cold water usage after the poster and stickers were put up. However in our assessment, 55 % of students were still not using cold water for laundry, so there is quite a bit of room for improvement. It should also be noted that we encountered several obstacles along the way: a first attempt used magnets instead of stickers, but the magnets very quickly disappeared after they were installed. We also discovered that all stickers were systematically removed over the summer. We learned that while we had communicated about our campaign to our sales representative, he had not communicated with our local service representative about the stickers. These instances help to illustrate the importance of ongoing assessment and evaluation, as well as the need for clear communication between program designers and all others. A full write-up of this intervention (and others) is available at http://new.oberlin.edu/office/environmental-sustainability/CBSM/.

4.2 Turning off Lights in Unused Classrooms

The lighting of academic buildings makes up a significant portion of the electricity use at Oberlin College. Observations of facilities and custodial staff suggested that lights are often left on even when no class is in session. In an effort to decrease electricity use, this study tested a simple and cost effective way to encourage people to turn the lights off when they leave a classroom. Focus groups at Oberlin College revealed that students simply forget to turn out the lights or do not feel authorized to manipulate lights in a public space.

To address the barrier of forgetting, our study utilized prompts. Previous research (Werner et al. 2012; Luyben 1980; Delprato 1977) has suggested that the use of prompts in the form of simple signs is an effective strategy to help people remember to turn off the lights. A prompt is most effective when it occurs directly before the targeted behavior, when it gives direct instructions for behavior, and when it encourages positive behaviors (McKenzie-Mohr 2011). We placed our signs on the inside of doors (where people look when exiting a classroom) and tested two different designs, to see which would be most effective. One version simply gave direct instructions for the behavior ("Please turn off the lights"), while the other included a picture of a popular celebrity (Jimmy Fallon) pointing at the viewer (in order to assign a sense of responsibility) with the words, "Please turn off the lights if you're the last one out."

We ran an observational study in an academic building with 24 classrooms. We collected data twice per day (at noon and 4:30 pm) for two weeks before and after putting signs up. Each round of data collection involved visiting each classroom and recording whether or not the lights were on, and whether or not there was anyone in the room. Before the signs were posted, lights were left on 69 % of the time in unoccupied rooms, and 90 % of the time in occupied rooms. After the signs were posted, lights were left on 43 % of the time in unoccupied rooms, and only 70 % of the time in occupied rooms. Both of these decreases were significant ($\chi^2 = 44.26$ and 14.61, respectively, p's < 0.001). There was no difference between morning and afternoon times, and no differences between the two sign types.

This very simple intervention did result in behavior change over a two-week period. However, our study does not address the lasting impact of prompts beyond two weeks or the potential effects of habituation over time. There is also still room for improvement, as lights in unoccupied rooms were still left on 43 % of the time. Future research will test other sign designs, placement of the signs, the durability of the effect, and the addition of an educational component.

5 Conclusion: Implementing CBSM Research Programs on Other Campuses

How can other institutions get started with a CBSM behavior change campaign? Some minimal level of institutional support is necessary. Oberlin's commitment to climate neutrality provided a clear institutional mandate for our project. However, for institutions that do not have such a clear commitment to sustainability, there are other compelling arguments for a CBSM program: it provides a valuable educational experience for students and it saves the institution money. A small budget is also helpful, to provide incentives to survey and focus group participants. However the most important factor is assembling a team of committed people with particular skills and abilities.

It is important to have someone who is comfortable with basic research design, quantitative analysis, and the ethics review board process. The experimental designs and corresponding statistics tend to be fairly basic, but they do require some expertise. At many institutions this will most likely be a faculty member. Training in CBSM is not essential; the free resources available online provide excellent guidance in the details of the approach. Nor is it essential that the research specialist make a large time commitment. Someone could serve this capacity in an advisory role.

Another key ingredient is students who can perform much of the labor, ideally for course credit or for student wages. Designing surveys, collecting and analyzing data, developing interventions, and testing them all require time and energy. Yet they are also experiences that are immensely valuable to students. Students often learn research and statistical skills through canned projects and fake data sets. Contextualizing learning in real world problems increases student motivation and improves retention. At Oberlin, students have gained experience with a wide range of research skills, including: literature reviews, conducting interviews, recruiting representative samples, running focus groups, minimizing response bias, collecting observational data, designing and deploying surveys, data analysis, presenting at conferences, and report writing (including this chapter!). Committed and diligent students who have had some research methods and statistics training can, under the guidance of a faculty mentor, perform most of these research-related tasks.

The final key ingredient is a faculty or staff member who can effectively connect the research team with the rather long list of relevant stakeholders. Finding a champion in a sustainability office or facilities office would be particular useful. Regular communication with all stakeholders is absolutely essential for success. For example, we presented to and sought feedback from union leaders before we surveyed union employees; we sought feedback on our list of behaviors from people as diverse as the Chief Financial Officer to members of the maintenance staff. We made particular effort to engage staff working in Facilities Operations as well as Residential Education, as most of our interventions intersected with their work. Communication of this nature is time consuming, and can often feel as if it is uncovering more obstacles than it is resolving. Short-circuiting the process of stakeholder engagement will not save time, however. Obstacles—both real and perceived—will be there. It is better to discover them early in the process, in a spirit of mutual collaboration, rather than later when resources have been invested and toes have been stepped on.

One final point worth noting is that there can sometimes be a tension between the most expedient approach from a sustainability perspective and the most educational approach. As institutions of higher learning, colleges and universities should consider not simply which behaviors are most impactful on campus, but what the impact of changing habits will be beyond the campus. For example, the most effective way to reduce the use of hot water for laundry is to simply plumb all machines to receive only cold water; many institutions take this approach. In the future Oberlin will pursue a hybrid strategy, in which all machines in a laundry room but one will be plumbed to receive cold water only; students will thus still

have the choice to use hot water, but it will be significantly constrained. The educational campaign will remain in place so that students learn and internalize the benefits of using cold water. Similarly, Oberlin's electricity portfolio is becoming increasingly renewable; in terms of carbon reduction turning off lights will have a smaller and smaller carbon impact. We chose to encourage electricity conservation behaviors anyway, for three reasons. First, students and faculty are creating habits that they will take into other communities that have less renewable portfolios. Second, demand that exceeds the capacity of Oberlin's renewable resources comes from carbon-intensive sources (typically coal), making it important to keep electricity demands as low as possible. Finally, the institution still pays for the use of electricity; reducing the utility bill allows resources to be spent in more mission-critical ways.

In conclusion, Community Based Social Marketing is a highly effective approach to promoting sustainable behavior on college and university campuses. Although the focus of our work has been on carbon reduction, CBSM can be used to promote any sustainable behavior (e.g. recycling, waste reduction). The benefits to the institution are many: behavior change programs are typically much cheaper than technological or infrastructure upgrades. They usually result in cost savings as well as environmental benefits; and if done correctly they also contribute to the educational mission of the institution.

References

Aronson E, O'Leary M (1983) The relative effectiveness of models and prompts on—energy conservation: a field experiment in a shower room. J Environ Syst 12(3):219–224

Billingsley W (2010) The check, clean, dry campaign, community-based social marketing case studies, http://www.cbsm.com/cases/the+check+clean+dry+campaign_171. Accessed 20 Feb 2015

Delprato DJ (1977) Prompting electricity energy conservation in commercial users. Environ Behav 9:433–440

Gardner GT, Stern PC (1996) Environmental problems and behavior. Allyn and Bacon, Boston, MA

Goldstein NJ, Griskevicius V, Cialdini RB (2007) Invoking social norms: a social psychology perspective on improving hotel's linen-reuse programs. Cornell Hotel Restaurant Adm Q 48 (2):145–150

Geller ES (1981) Evaluating energy conservation programs: is verbal report enough? J Consum Res 8(3):331–335

Herrick D (1994) Taking it to the stores: retail sales of recycled products. Resour Recycl 13(3): 33–37

Hirst E (1984) Household energy conservation: a review of the federal residential conservation service. Public Adm Rev 44(5):421–430

Houghton S (1993) Using verbal and visual prompts to control littering in high schools. Educ Stud 19(3):247–254

Lokhorst A, Werner C, Staats H, va Dijk E, Gale J (2013) Commitment and behavior change: a meta-analysis and critical review of commitment-making strategies in environmental research. Environ Behav 45:3–34

Lubyen PD (1980) Effect of informational prompts on energy conservation in college classrooms. J Appl Behav Anal 13:611–617

McKenzie-Mohr D (2011) Fostering sustainable behavior. New Society Publishers, Gabriola Island, British Columbia, Canada
Midden CJ, Meter JE, Weenig MH, Zieverink HJ (1983) Using feedback, reinforcement and information to reduce energy consumption in households: a field-experiment. J Econ Psychol 3 (1):65–86
Piraino L (2013) A load of energy savings, Western North Caroline green home and living guide, http://www.wncgreenbuilding.com/articles/full/a_load_of_energy_savings. Accessed 18 Mar 2015
Sherman SJ (1980) On the self-erasing nature of errors of prediction. J Pers Soc Psychol 39 (2):211–221
Smith JM, Bennet R (1992) Several antecedent strategies in reduction of an environmentally destructive behavior. Psychol Rep 70(1):241–242
Vigen M, Mazur-Stommen S (2012) Reaching the high-hanging fruit through behavior change: how community-based social marketing puts energy savings within reach, American council for an energy-efficient economy, http://aceee.org/white-paper/high-hanging-fruit. Accessed 18 Mar 2015
Werner CM, Cook S, Colby J, Lim H (2012) 'Light's out' in University classrooms: brief discussion can change behavior. J Environ Psychol 32:418–426

Authors Biography

Cynthia McPherson Frantz is Professor of Psychology at Oberlin College. She received her PhD in social psychology from the University of Massachusetts Amherst, and has spent the bulk of her career at Oberlin College. Her research focuses broadly on humans' relationship with the natural world, with an emphasis on promoting sustainable behavior. Frantz is coauthor of the widely used Connectedness to Nature Scale, and part of an interdisciplinary team studying the potential for feedback technology (www.environmentaldashboard.org) to encourage conservation behavior. In addition to directing the Community Based Social Marketing Research Project at Oberlin College, she has worked as a community leader promoting energy efficiency and a carbon neutral energy system in the City of Oberlin. Frantz received the 2014 Outstanding Teach and Mentoring Award from the Society for the Psychological Study of Social Issues (SPSSI) in honor of her mentorship of student researchers working on social issues.

Bridget Flynn is the Sustainability Coordinator at Oberlin College. She interacts with the administration, faculty, staff, students, and wider communities to focus attention on ways to maximize the environmental performance, social equity, and economic viability of Oberlin College. Bridget is instrumental in coordinating sustainability programming – from recycling to bicycling to conservation – and providing a connection between Oberlin and regional and national activities. Additionally, Flynn oversees the OES internship program where she harnesses the terrific energy and passion of a team of five to ten students. Flynn graduated cum laude from Indiana University (IU) in December 2011 with bachelor degrees with distinction in Environmental Ethics and Religious Studies, and a minor in Sociology. She serves on the City of Oberlin's Resource Conservation Recovery Commission, speaks nationally on sustainability topics, and is a competitive vegan bodybuilder.

Stephanie Atwood is a fourth year student at Oberlin College and Conservatory where she is pursuing degrees in psychology and violin performance. She is currently working on independent research in social cognition.

Daniella Mostow is a 2014 graduate of Oberlin College, where she majored in politics with a concentration in peace and conflict studies. Daniella's work on Community Based Social Marketing received the 2013 Undergraduate Student Research on Campus Sustainability Award from the Association for the Advancement of Sustainability in Higher Education (AASHE).

Cecilia Lang Xu is a fourth year student at Oberlin College where she double majors in psychology and economics. She has studied economics in London, and is currently completing independent research in behavioral economics.

Sarah Kahl is a fourth year student at Oberlin College where she double majors in psychology and environmental studies. Sarah has conducted independent research in environmental psychology both in Zanzibar and in the United States.