UBC Campus Sustainability Engagement and Social Marketing Strategy

Review of Related Research and Similar Programs

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Submitted by:

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1. Introduction

UBC is a world leader in campus sustainability initiatives that provide research and teaching opportunities while meeting the operational needs of the campus. UBC recognizes the importance of not only moving forward with cutting-edge, large scale infrastructure and operational solutions to climate change, energy management, water and waste, but also engaging and motivating all of UBC’s diverse community members to support the campus’ long term sustainability goals and actively conserve resources.

Campus Sustainability is now creating a strategy that will leverage or potentially redesign these programs in order to increase reductions in energy, greenhouse gas emissions, water and waste on campus from individual behaviours.

This report summarizes the key learnings from a review of related research and similar programs.

2. Key Findings

2.1 Divert Organics (in offices and residences)

The following best practices are based on what we learned from the operating organics composting programs with measured impacts:

- Use point-of-disposal prompts with vivid, life-like images (or, better yet, 3-D examples) indicating what should go into the compost collection bins (e.g. Harvard)

- Provide interested departments with assistance in setting up organics collection. Once departments submit an online form, provide them with a collection container for the organic waste and literature on what’s compostable. Provide on-site consulting to familiarize office members with the concept (e.g. what goes into the collection containers) and help each office set up a schedule for emptying the bin (e.g. Queen’s) Alternatively, have the bins emptied by custodial staff (e.g. Harvard). Use a similar approach with interested residence units.

- Ensure the collection bins have closing lids (to minimize smells and pests) that open with a step pedal (e.g. Harvard)
- Have a volunteer in charge of each collection bin to educate their peers and to ensure any issues or problems are reported and resolved promptly. For example, “Building Compost Captains” can provide information about composting to their neighbors in each building, field questions, and monitor bins to provide feedback and suggest improvements. (e.g. Harvard)

- Implement a transcript annotation system for rewarding and encouraging volunteers. (At UC Davis, Internships are an essential part of Project Compost. Interns don’t get paid in cash, but with transcript notation.)

- Profile departments and residence units that are diverting organics successfully. Use decals or other marker to raise the visibility of participation. (e.g. LURA’s residential organics program in Langley BC)

- Have participating departments and residences compete to divert the most organics (e.g. Duke)

- Install compost collection bins in high food-waste locations outdoors (e.g. where many outdoor events are held; U. of Washington)

In addition, it would be useful to counter low response efficacy (‘my actions won’t make much difference’) by providing inspiring feedback on what is being accomplished through organics diversion.

<table>
<thead>
<tr>
<th>Behaviour:</th>
<th>Divert Organics</th>
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Divert organics / reduce contamination across all streams (offices and residences)</td>
</tr>
<tr>
<td><strong>Barriers</strong></td>
<td></td>
</tr>
<tr>
<td>• Lack of awareness and knowledge</td>
<td></td>
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<tr>
<td>• Forgetting to separate out food waste</td>
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<tr>
<td>• Uncertainty about what to do with paper towels, napkins, and tissues</td>
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<tr>
<td>• Concern about odors and/or vermin</td>
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<tr>
<td>• Inconvenience; the need to empty compost collection bins in a central receptacle</td>
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<td>• Concern that the office or residence does not generate enough material to fill the bin (e.g. concern of investing in costly compostable bags)</td>
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<td>• Benefits may accrue to the university, not the person taking action</td>
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<tr>
<td>• Low response efficacy (‘my actions won’t make much difference’)</td>
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<tr>
<td><strong>Benefits</strong></td>
<td></td>
</tr>
<tr>
<td>• Taking out the compost is an easy way to do one’s part for the environment</td>
<td></td>
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<tr>
<td>• At UC Davis, Internships are an essential part of Project Compost. Interns don’t get paid in cash, but with transcript notation!</td>
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<tr>
<td>• Better health</td>
<td></td>
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<tr>
<td><strong>Awareness and</strong></td>
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<tr>
<td>• Prompts with images (or 3-D examples) indicating what should go into the</td>
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<tr>
<td>Behaviour Change strategies and tools used (and if available, measures of their success)</td>
<td>Best Practices - Impacts Measured</td>
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<td></td>
<td><em>Personalized, Credible Empowering Communication; Increasing Convenience / Overcoming Specific Barriers.</em></td>
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<td></td>
<td>Queen’s University provides interested departments with assistance in setting up organics collection. Departments submit an online form, and are then provided with a collection container for the organic waste and literature on what’s compostable. The Program also provides on-site consulting to familiarize office members with the concept (e.g., what goes into the collection containers) and helping the office set up a schedule for emptying the bin. Every week, 64 green bins worth of waste (200 kg) are diverted from landfills.</td>
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<tr>
<td>Competitions with Incentives</td>
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<tr>
<td></td>
<td>• Eco-Olympics (e.g. at Duke U.)</td>
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<tr>
<td>Personal Visit, Obtaining a Commitment</td>
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<tr>
<td></td>
<td>• A door-to-door visit and request for a public commitment, followed-up by a visit and then a phone call were key parts of the “high level of intensity” intervention that LURA used in Langley BC, resulting in an estimated garbage reduction of 31% (non-university setting)</td>
</tr>
<tr>
<td>Overcoming Specific Barriers, Peer Support, Word of Mouth</td>
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<td></td>
<td>• According to Harvard, key elements of its Law School’s successful composting program include: (1) having bins with closing lids (to minimize smells and pests) that open with a step pedal, (2) having the bins emptied by custodial staff instead of by volunteers, (3) having the bins emptied daily to prevent smells and/or pests, and (4) having a volunteer in charge of each bin to educate their peers and to ensure any issues or problems are reported and resolved promptly. HLS has developed a network of knowledgeable volunteer “Building Compost Captains” to help spread the word and best practices with the community. The Building Compost Captains provide information about composting to their neighbors in each building, field questions, and monitor bins to provide feedback and suggest improvements.</td>
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<tr>
<td>Prompts</td>
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<td></td>
<td>• Prompts to put food waste and napkins into compost collection bins</td>
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<tr>
<td>Norm Appeals</td>
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<tr>
<td></td>
<td>• Profiles of success stories; decals indicating participation (LURA, 2010)</td>
</tr>
<tr>
<td>Other lessons learned</td>
<td></td>
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</tbody>
</table>
|  | • Start small. Harvard expanded to 1 bin per building (17 bins total) “We wanted to only go to one bin per building so it wasn’t too overwhelming for the facilities and custodial partners all at once. And in the back of our minds we knew we wanted to start small so we could be nimble in identifying and
correcting any issues quickly.” (Cosgrove, 2011)

- The University of Washington installed 13 outdoor e.g. LURA’s Solar Kiosks that accept compostables. The kiosks contain technology to help maximize and monitor waste collection. The pilot location was selected because it is a high food waste consumption area, and hosts many events year-round. In the first month of use, the total volume of waste collected on Red Square was 42% compostable. That’s roughly 2,200 pounds of compostable material kept out of the landfill. The remaining volume was 38% recyclable and only 20% actual garbage.

Model Programs

- Duke University
- Harvard University
- Queen’s University
- Langley BC’s residential campaign
- UC Davis

References

AASHE  https://stars.aashe.org/institutions/university-of-washington-seattle-wa/report/2012-10-17/10/41/283/

Cosgrove K. Post-Consumer Composting at Harvard Law School (AASHE Conference presentation, October 2011)


Harvard http://www.green.harvard.edu/labs

Harvard http://green.harvard.edu/more-places-compost-hls

LURA

2.2 Recycle Plastics (in labs)

The following best practices are based on what we learned from the operating university plastics recycling programs with measured impacts.

- Develop a set of standard procedures for sorting nonhazardous plastics at the point of use
- Provide separate color-coded bins for recycling glass and recycling plastics, with matching prompt decals illustrating what goes where, reminding users to triple rinse the objects and put gloves and garbage in other bins, and providing a phone number for further details
- Implement a Green Lab Certification Program that would include plastics recycling among other criteria

In addition, counter low response efficacy (‘my actions won’t make much difference’) by providing inspiring feedback on what is being accomplished through recycling lab plastics.

<table>
<thead>
<tr>
<th>Behaviours</th>
<th>Recycle Plastics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Recycle plastics in labs</td>
</tr>
<tr>
<td>Barriers</td>
<td>The main barrier is the forming of new habits in handling the material while working</td>
</tr>
<tr>
<td></td>
<td>Inconvenience; the large volume of nonhazardous plastic must be separated from hazardous waste</td>
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<tr>
<td></td>
<td>Low response efficacy (‘my actions won’t make much difference’)</td>
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<tr>
<td></td>
<td>Lack of awareness and knowledge</td>
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<tr>
<td></td>
<td>Forgetting</td>
</tr>
<tr>
<td></td>
<td>Benefits may accrue to the university, not the person taking action</td>
</tr>
<tr>
<td>Benefits</td>
<td>Good for the environment / doing the right thing</td>
</tr>
<tr>
<td>Awareness and education activities</td>
<td>BCIT’s Biotechnology laboratory implemented a system for diverting laboratory plastic waste by developing a set of procedures for sorting nonhazardous plastics at the point of use</td>
</tr>
<tr>
<td>Behaviour Change strategies and tools used (and if available, measures of their success)</td>
<td>Impacts Measured</td>
</tr>
<tr>
<td></td>
<td>Prompts, increasing convenience</td>
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<tr>
<td></td>
<td>The champions of BCIT’s Biotechnology laboratory initiative needed to give friendly reminders to others in the program when recyclable material was about to be diverted into the wrong stream. The program has been able to divert for recycling over a third of the total lab plastic waste.</td>
</tr>
<tr>
<td></td>
<td>The University of Toronto provides separate color-coded bins for recycling</td>
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</tbody>
</table>
glass and recycling plastics. Matching prompt decals illustrate what goes where, remind users to triple rinse the objects and put gloves and garbage in other bins, and provide a phone number for further details.

**Feedback and Recognition, Norm Appeals, Peer Support**  
- Green Lab Certification programs (e.g. Harvard)

### Impact Not Measured

**Feedback and Recognition, Norm Appeals, Peer Support**  
- Campus-wide awards and recognition in sustainability (e.g. Harvard’s annual Green Carpet Awards)

| Model Programs | BC Institute of Technology  
|                | Harvard  
|                | University of Toronto |

|                | Harvard [http://www.green.harvard.edu/labs](http://www.green.harvard.edu/labs) |
|                | University of Toronto [http://www.fs.utoronto.ca/recycle/Non-hazardous_Lab_GlassandPlastics.htm](http://www.fs.utoronto.ca/recycle/Non-hazardous_Lab_GlassandPlastics.htm) |

### 2.3 Reduce Plug Loads / Shut Off Power *(all settings)*

The following best practices are based on what we learned from university and other behaviour change programs to reduce plug loads / shut off power (programs with measured impacts.)

- Where practical, use automated control devices that turn off plug load devices after 15 minutes of no occupancy (Metzger et al, 2011)

- Provide centrally-funded desktop power management software to all faculty, staff and students. Set computer sleep settings as group policies to override individuals defeating their individual computers’ sleep settings (e.g. Stanford, University of Wisconsin)

- Provide high resolution, real-time feedback on energy use with both descriptive norms (how well you did relative to others) and injunctive norms (what is the right thing to do). Track Oberlin’s work with empathetic characters to convey emotional content associated with particular levels of resource use, and (in storytelling mode) to celebrate pro-environmental behaviours; and its use of social, economic and ecological contextualization as mechanisms for enhancing the impact of feedback.
• Provide energy conservation challenges and competitions, and winter closure campaigns (e.g. U.C. Davis National Freezer Challenge; U. Of Toronto’s ReWire program)

• Emphasize that better freezer management leads to improved sample access, reduced overhead and maintenance, and that turning computers off when not in use leads to improved data security and computer longevity. (UC Davis; Marbek, 2007)

• Use plug-load energy management platforms that enables office and lab users to monitor and control electrical usage of individual devices (e.g. Oberlin’s use of Lucid’s building dashboard combined with Enmetric’s plug-load energy management platform)

• Provide non-obtrusive, non-habituating ambient feedback close in time and space to resource consumption (e.g. Oberlin)

• Give schools and administrative units a financial incentive to use less electricity (e.g. Stanford)

• Implement a Green Office and/or Green Lab certification program(s) (e.g. Harvard, Stanford, University of Colorado at Boulder)

• Implement a “Cash for Clunkers”-type program with incentives to labs that put DNA and RNA samples into room temperature storage and dispose of old ultra-low temperature freezers. Offer long term storage options in shared, efficient freezers and mobile freezers that are loaned to labs when defrosting, organizing or experiencing a freezer failure, as an engagement tool (foot in the door) with labs. (e.g. Stanford)

• Host a freezer fair with vendors for labs, to promote wise freezer use and showcase more energy-efficient models (UC Davis)

• Pay for freezer disposal and helping scientists find out about higher-temperature and room-temperature storage opportunities. Consider offering long term storage in shared, efficient freezers. (e.g. University of Colorado at Boulder)

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### Behaviours

#### Reduce Plug Loads / Shut Off Power

<table>
<thead>
<tr>
<th>Descriptions</th>
<th>Use power management on computers (residences and offices)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shut off idle equipment (offices and labs)</td>
</tr>
<tr>
<td></td>
<td>Use freezers more efficiently (labs)</td>
</tr>
<tr>
<td></td>
<td>Unplug bench equipment when not in use (labs)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Residences to the effective use of power strips in residences can include the following</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Barriers</strong> forget to turn if off (56%)</td>
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<tr>
<td></td>
<td>Unaware of significance (that 75% of energy consumed by electronic devices occurs when the device is not on but still plugged in) (53% plus up to 7%)</td>
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</table>
who did not respond to this question)

- Hard to reach power strip to turn it off (21%)
- “Doesn’t affect me personally” (17%)
- Think it won’t save much (14%)
- Takes too much time to turn it off (11%)
- Uncertainty about which devices can be unplugged when not in use
- Others: Complex and uninformative instructions; difficulty in setting them up effectively, too few plugs (not measured)

(% of survey respondents who agreed strongly (selected 5 or 6 on a 6 point scale for students at residences at University of Colorado at Boulder)

- Concern that the computer will take too long to power up
- Benefits may accrue to the university, not the person taking action
- Low response efficacy (‘my actions won’t make much difference’)

**Offices**

- **Barriers** to enabling and properly programming existing power management settings of computers and imaging equipment in an office setting can include lack of user information and education, users requesting remote access to their desktop computers and conflicting practices with existing IT management policies, and concern that the computer will take too long to power up
- Forgetting
- Inconvenience
- Benefits may accrue to the university, not the person taking action
- Low response efficacy (‘my actions won’t make much difference’)

**Benefits**

- Data security, privacy concerns, and computer longevity may be at least as compelling motivations to shutting off PCs as energy savings (Marbek, 2007)

**Labs**

- Better freezer management leading to Improved sample access, reduced overhead and maintenance

**Awareness and education activities**

**General**

- The University of Colorado at Boulder found that the most effective places to hang posters were in toilet stalls and above urinals in washrooms. Also in stairways where people turn. Not in hallways (“people don’t read them”)

**Residences**

- Oberlin College came up with the catchy title “Let’s Strip” for its power strip guide for students

**Offices:**
• UCDavis hosts a freezer fair with vendors for labs. The program is called “Store Smart”

**Impacts Measured: Offices and Residences**

**Competitions and Norm appeals**
• Competitions have become a core element of many office and college residence programs.
• In a study conducted with 126 occupants of four floors of an office building, Metzger et al (2011) found that competitions achieved significantly lower (worse) energy and cost savings compared with an automated control system that turned off plug load devices after 15 minutes of no occupancy. However, competitions were significantly more effective than letters sent to occupants educating them about plug load energy use and opportunities for conservation, which had negligible savings.
• At Oberlin College digital feedback includes both descriptive norms (how well you did relative to others) and injunctive norms (more thumbs up the more you conserved) to help reduce rebound effect

**Prompts, Norm Appeals, Peer Support, Word of Mouth; Credible, Personalized, Empowering Communication**
• The University of Toronto’s ReWire Program targets turning off computers in October, then in December focuses on making sure that things are turned off and unplugged before they leave for an extended leave of two weeks when students go home for Christmas. At the start of each month, volunteers pick up the prompts from the Sustainability Office and they put them up on their floors. They talk to their peers and neighbours at the monthly floor meetings they have to discuss the goals of the month. Then it is up to them, for the rest of the month, to talk about the theme and actions with their peers whenever they get the chance, as well as hold events. Overall, the program reduced consumption by between 221 and 258 MWh in its second year when it ran in seven residences with 1,500 students. The savings were attributed to powerful pro-environmental social norms. Two of the most common behaviour changes were turning off the TV when leaving the common room, and activating computer energy efficiency settings. There was a smaller increased in the number of people turning off printers and speakers when not in use.

**Feedback**
• At Oberlin College, dormitories that received high resolution feedback (automated real time data) were more effective at conservation, reducing their electricity consumption by 55 percent compared to 31 percent for low resolution dormitories (where utility meters were manually read and the data were provided to participants once a week.) Residents of the high-resolution feedback dormitories showed greater interest in feedback, visiting the Dormitory Energy web site an average of 4.8 visits / resident compared to 2.5 visits for the low-resolution group. Within the two high-resolution feedback dormitories, there was no clear difference in electricity reductions among students who had the electricity use of their individual floor displayed on the web site and those who did not have their individual floor’s electricity displayed.
• The dashboard used by Oberlin College uses empathetic characters to convey
emotional content associated with particular levels of resource use, and (in storytelling mode) to celebrate pro-environmental behaviours.

- At Oberlin, 36 orbs have been installed to provide non-obtrusive, non-habituating ambient feedback close in time and space to resource consumption. The orbs have been associated with significant reductions in energy use and an increase in awareness, motivation and understanding and interest. 50% of students surveyed who participated in a pilot project indicated that as a result of the program they were shutting off computer monitors while not in use and 39% said they were turning computers off when not in use.

- Incentives for staff and faculty:
  - Performance-based incentives. Since 2004, Stanford has given schools and administrative units a financial incentive to use less electricity. Its program sets a budget based on past consumption and lets participants "cash in" unused kilowatt-hours; those that exceed their electricity budgets pay the difference out of their own funds. By the end of the program’s third full year, participants collectively used 3 percent less electricity than budgeted—netting a total rebate of $830,000. The program aims to reduce electricity use by 5 percent from a 2003 baseline. A number of schools and administrative units have already achieved this goal.
  - Stanford’s mandatory Winter Closure campaign recognizes both participation and performance through raffles for cash prizes.

**Feedback and Recognition, Norm Appeals, Obtaining a Commitment, Peer Support**

- Green Office certification programs (e.g. Harvard; Stanford’s Building Heroes Program). Harvard’s entry level of office certification (leaf one) requires use of power management features on computers and printers. Level three (three leaves) requires the use of power strips as central turn-off points in individual work stations, to be switched off each night. Stanford’s program requires and provides incentives for offices to take a web course on sustainable office spaces.

- After Bell Canada’s Everyday Kyoto campaign, 12% of surveyed employees reported leaving their computers on one or more nights per week, a rate that is one-third fewer than the 17% estimated a year earlier. Six out of ten (64%) of Everyday Kyoto participants shut off their monitors when leaving for 30 minutes or more (Tools of Change, 2012).

**Vivid Communication**

- Oberlin College has been testing the use of social, economic and ecological contextualization as mechanisms for enhancing the impact of feedback.

**Convenience, Overcoming Other Barriers**

- Lucid’s building dashboard has been combined with Enmetric’s plug-load energy management platform enabling users to monitor and control electrical usage of individual devices in offices, campuses and other commercial and institutional buildings.

- Stanford provides centrally-funded desktop power management software to all faculty, staff and students.
• The University of Wisconsin is using Windows 7 to set sleep settings as group policies. If a user defeats his or her computer’s sleep settings (thereby wasting energy), group policy overrides it. This allows administrators to enforce the policy across all machines and all users. Because staff and students were in the habit of leaving computers and monitors turned on, EPA estimates that this project will save the university more than $76,500 annually. Over three years, the useful life of a typical computer, this amounts to well over $200,000, preventing more than 3,520 tons of CO2 from being released into the atmosphere.

Impacts Measured: Labs

Competitions and Norm appeals
• UC Davis hosts the National Freezer Challenge. At UC Davis 19 labs and 50 participants took actions that saved $26,700 annually

Incentives
• For staff and faculty:
  o Performance-based incentives. Since 2004, Stanford has given schools and administrative units a financial incentive to use less electricity. Its program sets a budget based on past consumption and lets participants "cash in" unused kilowatt-hours; those that exceed their electricity budgets pay the difference out of their own funds. By the end of the program’s third full year, participants collectively used 3 percent less electricity than budgeted—netting a total rebate of $830,000. The program aims to reduce electricity use by 5 percent from a 2003 baseline. A number of schools and administrative units have already achieved this goal.
  o Free (University of Colorado at Boulder) or subsidized (Stanford and UC Davis) purchase and installation of appliance timers and smart strips or energy-efficient freezers
  o Stanford’s Cash for Clunkers program provides incentives to labs that put DNA and RNA samples into room temperature storage and dispose of old ultra-low temperature freezers
  o Stanford’s mandatory Winter Closure campaign recognizes both participation and performance through raffles for cash prizes.

Feedback, Norm Appeal, Overcoming Specific Barriers
• University of Colorado at Boulder uses the approach pioneered by Allen Doyle of UCLA Davis to provide energy-use data for specific equipment. No electrician is needed to set up temporary energy-use metering of the lab equipment. The Green Labs program arranges with an engineer from Facilities to do this. An energy-use rating label / poster is left behind. (Feedback, Norm Appeal) To encourage storage at higher temperatures, it maintains an on-line database of bio-samples stored above -70 degrees Celsius (Norm Appeals, Overcoming Specific Barriers), pays for freezer disposal and helps scientists find out about higher-temperature and room-temperature storage opportunities. Property Services provides long term storage options in shared, efficient freezers. Turning off lab equipment when not in use has
resulted in:

- 55 refrigerators, freezers, drying ovens and incubators unplugged because they were not being used, for a savings of about 137,000 kWh/yr
- 109 other pieces of equipment being turned off nightly for shutdown, for a savings of about 92,000 kWh/yr
- 39 centrifuges, electron microscopes, bio-safety cabinet blowers and other specific pieces of equipment manually turned off between uses, for a savings of about 78,000 kWh/yr

**Convenience, Overcoming Specific Barriers – computers**

- Stanford provides centrally-funded desktop power management software to all faculty, staff and students
- The University of Wisconsin is using Windows 7 to set sleep settings as group policies. If a user defeats his or her computer’s sleep settings (thereby wasting energy), group policy overrides it. This allows administrators to enforce the policy across all machines and all users. Because staff and students were in the habit of leaving computers and monitors turned on, EPA estimates that this project will save the university more than $76,500 annually. Over three years, the useful life of a typical computer, this amounts to well over $200,000, preventing more than 3,520 tons of CO2 from being released into the atmosphere.

**Feedback and Recognition, Norm Appeals, Peer Support**

- Green Lab certification programs (e.g. Harvard)
- Lab Eco-Leaders programs support local change agents (e.g. at University of Colorado, Boulder)

**Impacts Not Measured**

**Prompts**

- Example of a prompt from Duke University: The sound of silence. Operating a TV uses the same amount of energy as up to 30 compact fluorescent light bulbs. Turn it off when you’re done.

**Feedback and Recognition, Norm Appeals, Peer Support**

- Campus-wide awards and recognition in sustainability (e.g. Harvard’s annual Green Carpet Awards)

**Other lessons learned**

- *Freshmen seem most receptive:* At Oberlin College the two exclusively freshman dormitories on campus exhibited relatively high electricity reductions (average = 46 percent), while the two exclusively upperclassman dormitories exhibited anomalously low electricity reductions (average = 2 percent).*
- *Target distribution of strips carefully:* In Oberlin College’s power strip pilot, many students in residence who received the power strips did not use them to reduce energy use and were not interested in doing so. This led to a recommendation to only distribute the strips to students who showed interest in using them
- *Load-sensing devices:* Metzger et al (2012) found in an office setting that there was wide spread acceptance of the devices in most instances. “Occupants experienced some issues turning devices on in the mornings or unexpected shutdowns in the
evenings when working late. This typically was resolved by pressing the manual override button on the APS, which in some instances was expressed to be a nuisance. When asked whether or not occupants would like more control over their individual devices, the majority of respondents said ‘no.’ However, an overwhelming majority of respondents indicated that they would be willing to program their individual schedules into an APS. Almost all respondents indicated that behavior was not changed as a result of this research. Those who had access to the online dashboard indicate that they rarely or never checked the real-time energy performance of the plug-loads, which reduces the value of the submetering capabilities."

- The Green Labs Program at the University of Colorado at Boulder has a number of mobile freezers that are loaned to labs when defrosting or organizing; these are also valued when there are freezer failures and have been a great engagement tool (foot in the door) with these labs.

**Model Programs**
- Oberlin College
- Stanford
- UC Davis
- University of Colorado at Boulder
- University of Toronto’s Rewire Program

**Support / Tie-In Programs**
- *Do it in the Dark* is the BC electricity and water reduction competition on college and university campuses. Students compete to achieve the greatest reductions in their residence halls
- *Campus Conservation Nationals* is the largest North American electricity and water reduction competition on college and university campuses. Students compete to achieve the greatest reductions in their residence halls over a three-week period
- *National Freezer Challenge*. Targeted at universities across the nation, the challenge encourages labs to address the many actions that can be taken to improve sample access and energy efficiency related to lab freezers.

**References**


Petersen, John. 2012. Multiple modes and scales of feedback on environmental performance to motivate and empower transformation. Presentation at Oberlin College, February 2012.

Stanford Building Hero Actions Accessed 12/21/2012
http://sustainable.stanford.edu/be_cardinal_green_cardinalbuildings

http://www.toolsofchange.com/English/CaseStudies/default.asp?Id=184

UC Davis http://sustainability.ucdavis.edu/
US EPA En Energy Star

2.4 Shut the Sash (in labs)
The following best practices are based on what we learned from university programs to lower fume hood sash heights (programs with measured impacts.)

- Participate in an annual Shut the Sash Campaign, but inspect sash heights year-round, not just during the campaign. For example, use static cling decals to (1) reinforce what was done, if closed properly, (2) ask for the sash to be closed a little further, if almost closed, and (3) ask for the sash to be closed, if left open (e.g. University of Colorado at Boulder).

- Implement a Green Lab certification program (e.g. Harvard, Stanford, University of Colorado at Boulder)

- Link fume hood controls to building management systems (U. of Nottingham)

- Offer incentives to encourage labs to permanently or temporarily retire unused fume hoods (e.g. University of Colorado at Boulder)

In addition, it would be useful to counter low response efficacy (‘my actions won’t make much difference’) by providing inspiring feedback on what is being accomplished through shutting sashes.
<table>
<thead>
<tr>
<th>Behaviours:</th>
<th>Shut The Sash</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>• Lower fume hood sash heights in labs</td>
</tr>
</tbody>
</table>
| **Barriers** | • Requirements of experiments (chromatography, use of large/long columns, comfort while working)  
• Forgetting to do it  
• Lack of understanding of the benefits / underestimate how much energy fume hoods use  
• Benefits may accrue to the university, not the person taking action  
• Low response efficacy (‘my actions won’t make much difference’)  
• Fume hood malfunctions |
| **Benefits** | • Improved Safety – fume cupboards are generally safest when sashes are lowered  
• Good for the environment / right thing to do |
| **Awareness and education activities** | • Incorporate information about the energy impact of fume hoods in lab safety training  
• Stickers on fume hoods  
• Outreach events |
| **Behaviour Change strategies and tools used (and if available, measures of their success)** | **Impacts Measured**  
*Feedback and Recognition, Norm Appeals, Peer Support*  
• Green Lab certification programs (e.g. Harvard)  
• Participation in annual Shut the Sash campaigns (Harvard’s Shut the Sash now includes 20 labs and counting, and saves roughly $250,000 annually in energy costs)  
• The University of Nottingham linked the controls of 380 fume hoods (“fume cupboards”) into its Building Management System (BMS) allowing it to calculate average sash heights. It sends monthly reports on fume hood use to lab users, with an estimate of the amount of savings compared to their running 365/24/7. The reports also include a cumulative running total of savings (compared to the 24/7 situation) for the academic year. Based on a 10% reduction in use, potential savings are estimated at least £62,700 per year, 1.9 million kWh energy and 520 tonnes of carbon dioxide. “By linking in to the BMS we have managed to raise awareness and save a considerable amount of money with relatively little extra effort.” |

*Participation in annual Shut the Sash campaigns combined with ongoing prompts, feedback and norm appeals between campaigns*
University of Colorado at Boulder Green Labs program inspects sash heights year-round, not just during its Shut the Sash campaign. One of three static cling decals are left behind (1) reinforcing what was done, if closed properly, (2) asking for the sash to be closed a little further, if almost closed, and (3) asking for the sash to be closed, if left open. Before the Shut the Sash campaign in the fall of 2009, average sash height was around 9 inches. That fell to around 3 inches during the contest, remaining below 5 inches through the following year.

**Impacts Not Measured**

*Feedback and Recognition, Norm Appeals, Peer Support*

- Campus-wide awards and recognition in sustainability (e.g. Harvard’s annual Green Carpet Awards)

**Other lessons learned**

- To encourage labs to retire unused fume hoods, University of Colorado at Boulder will retire pre-approved hoods, pay the department up to $500 and provide a storage cabinet or bench space at no cost (for constant air volume hoods only). It is possible to have the fume hoods taken off ventilation temporarily.
- At the University of Toronto the Shut the Sash campaign reduced sash heights substantially during the campaign. However, eight months after the campaign, sash heights had “mostly – not entirely – reverted to pre-campaign levels.

**Model Programs**

- Duke University
- Harvard
- University of Colorado at Boulder
- University of California, Berkeley (also at UC Irvine, UCLA and UC SanDiego)
- University of Nottingham
- University of Toronto

**Support / Tie-In Programs**

- Alliance to Save Energy’s Shut the Sash program

**References**

- Sadowski R. Shut the Sash Report. UBC, 2012
2.5 Shut off Water and Power (in labs)

The following best practices are based on what we learned from university programs to shut off water and power used by large lab equipment between experiments (programs with measured impacts.)

- Arrange for voluntary laboratory assessments, conducted by student interns, which examine current activities, identify improvement opportunities, and provide support for implementation (UC Davis)

- Implement a Green Lab certification program. Include criteria for shutting off water and power used by large lab equipment between experiments; provide random spot checks with a small incentive for compliance (e.g. University of Colorado at Boulder)

- Pay for freezer disposal and helping scientists find out about higher-temperature and room-temperature storage opportunities. Consider offering long term storage in shared, efficient freezers. (e.g. University of Colorado at Boulder)

In addition, it would be useful to counter low response efficacy (‘my actions won’t make much difference’) by providing inspiring feedback on what is being accomplished through shutting off water and power used by large lab equipment between experiments.

<table>
<thead>
<tr>
<th>Behaviours: Shut Off Water and Power</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>• Shut off water and / or power used by large lab equipment between experiments in labs</td>
</tr>
<tr>
<td><strong>Barriers</strong></td>
</tr>
<tr>
<td>• Lack of awareness and knowledge</td>
</tr>
<tr>
<td>• Forgetting</td>
</tr>
<tr>
<td>• Inconvenience</td>
</tr>
<tr>
<td>• Benefits may accrue to the university, not the person taking action</td>
</tr>
<tr>
<td>• Low response efficacy (‘my actions won’t make much difference’)</td>
</tr>
<tr>
<td><strong>Benefits</strong></td>
</tr>
<tr>
<td>• Good for the environment / right thing to do</td>
</tr>
<tr>
<td><strong>Awareness and education activities</strong></td>
</tr>
<tr>
<td><strong>Behaviour Change strategies and tools used (and if available, measures of their impacts measured)</strong></td>
</tr>
<tr>
<td>Feedback and Recognition, Norm Appeals, Peer Support</td>
</tr>
<tr>
<td>• UC Davis’s Laboratory Research and Technical Staff (LabRATS) Program encourages more researcher input into design and operational decisions</td>
</tr>
</tbody>
</table>
success) which influence lab energy and organizes the National Freezer Challenge. LabRATS arranges for voluntary laboratory assessments, conducted by student interns, which examine current activities, identify improvement opportunities, and provide support for implementation (Slab has adapted this process for UK universities). The assessments highlight good practices, uncover opportunities, enroll new participants and promote best practices across departments.

*Incentives; injunctive norms, Feedback, Prompts, Building Motivation over Time*

- The University of Colorado at Boulder’s Green Labs program spot checks to see if equipment has been turned off between uses. Each positive inspection gets a stamp and each stamp can be used in a raffle for gift cards of $125.

*Overcoming Specific Barriers*

- University of Colorado at Boulder’s Green Labs program pays for freezer disposal and helps scientists find out about higher-temperature and room-temperature storage opportunities. Property Services provides long term storage in shared, efficient freezers.

*Impacts Not Measured*

*Feedback*

*Feedback and Recognition, Norm Appeals, Peer Support*

- Stanford developed a new water billing statement that allows customers to review water use and easily compare the change in use, as well as trends in use over the last 13 months.
- Campus-wide awards and recognition in sustainability (e.g. Harvard’s annual Green Carpet Awards)
- Some labs at University of Colorado at Boulder have a “no names policy” on doors, to indicate that freezers, fume hoods should be shared.

*Prompts*

- To prompt action and overcome confusion about what equipment can be turned off with a timer, University of Colorado at Boulder distribute decals and posters that are put on the equipment to make it clear how and when to turn them off manually.
- Examples from Duke University
  - When it’s not in use, what’s your excuse? 1 minute = 2.5 gallons. Turn off the faucet.
  - 1 minute = 2.5 gallons. Humans are using fresh water faster than it can be replaced. Turn off the faucet.

*Other lessons learned*
2.6 Take Shorter Showers (in residences)

The following best practices are based on what we learned from university and other behaviour change programs to promote shorter showers (programs with measured impacts.)

- Install waterproof, break-proof shower timers (e.g. U. Of Florida, Western Washington U.)
- Use ambient visualization ((Kuznetsov and Paulos, 2010) and/or an auditory signal in addition to numerical feedback (e.g. Western Washington U.; Willis et al, 2010)
- Instal manual shutoff valves (e.g. UC Berkeley’s UZLOW valves).

In addition, it would be useful to counter low response efficacy (‘my actions won’t make much difference’) by providing inspiring feedback on what is being accomplished through taking shorter showers. It might also be worth installing automatic shutoff valves, as found in some spas and sports facilities.

| Model Programs       | • Duke  
|                      | • Stanford  
|                      | • UC Davis  
|                      | • University of Colorado at Boulder  
| Support / Tie-In Programs |  
|                      | Stanford  [http://sustainable.stanford.edu/be_cardinal_green_cardinalbuildings](http://sustainable.stanford.edu/be_cardinal_green_cardinalbuildings)  
|                      | UC Davis  [http://sustainability.ucdavis.edu](http://sustainability.ucdavis.edu)  

| Behaviour: | **Take Shorter Showers**  
| Description | • Take Shorter Showers in residences  
| Barriers | • The more things people do in the shower, the longer time they take. In one study, shaving legs added up to 10.47 minutes to showering time with exfoliating increasing time spent by 9.08 minutes. (Silmalis, 2006)  
|           | • Some people take long showers to relax / ‘de-stress’ |
- Lack of awareness and knowledge
- Forgetting
- Misconception about how long one's showers really take
- Misconception about water replenishment and availability; Most BC residents, including students, rate water supply as a relatively low priority and think they are already trying hard or very hard to conserve water. RBC (2012)
- Inconvenience
- Benefits may accrue to the university, not the person taking action
- Low response efficacy (‘my actions won’t make much difference’)

Benefits

- “late less frequently because I don't spend as much time in the shower” (Comment from a participating student who used a shower timer at the University of Florida)
- Good for the environment. By far, residents of BC consider water to be Canada’s most valuable natural resource. Many have experienced water use restrictions. RBC (2012)

Awareness and education activities

<table>
<thead>
<tr>
<th>Behaviour Change strategies and tools used (and if available, measures of their success)</th>
<th>Impacts Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitions, Incentives, Norm appeals</td>
<td></td>
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<tr>
<td>• Campus Conservation Nationals</td>
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</tbody>
</table>

Prompts / Feedback

- The University of Florida provided free sand-filled shower timers in residences. The following are survey results for use of the timers.

  Q4 How many times have you used the Shower Coach Timers?
  Don’t use it – 18.4% (males 17.1%, females 18.9%)
  1-5 times – 31.9% (males 26.7%, females 34.2%)
  6-10 times – 12.1% (males 10.9%, females 12.9%)
  More than 10 times – 14.8% (males 15.9%, females 14.5%)
  Every time I shower – 22.8% (males 29.5%, females 19.5%)
  The shower campaign is estimated to save at least 3+ gallons of water per resident/per day.

- In 2010, Kuznetsov and Paulos found that in a semi-private setting, ambient visualization was preferred to numeric displays. The ambient visualization involved orbs that showed a green light while water usage was below average, fading to yellow as water usage reached average, red as water usage reached 150% of average and finally flashing when usage exceeded 200% of the average. “One participant favored the ambient approach because it was “more gradual” and “less stressful” than the constantly
increasing number of gallons on the numeric display, as well as easier to notice without being distracted. Another user noted that unlike the numeric display, the ambient visualization is a better indicator of “the correct amount to be used”. Similarly, one respondent liked the flashing red light because it was more effective at getting her attention and conveying negative information, although she suggested even more negative reinforcement. Lastly, the participant who preferred the numeric feedback to the ambient still agreed that “aesthetically, the ambient one looked nicer” (Kuznetsov and Paulos, 2010.)

- Willis achieved a 27% reduction in shower event volumes in 44 households using a visual display monitor that beeped for one minute at a set level of consumption.

- Western Washington University ran a three month pilot using 70 waterproof digital timers. The timers are bright blue and shaped like a drop of water, stick to the side of the shower with a suction cup and allow users to set a target shower time. As the timer gets close to the target time, it starts beeping to remind you to finish up your shower. The program was voluntary, the timers were fairly well received and the university saw a ~22% drop in water use over the three-month period.

- Examples of text prompts from Duke University
  - Shorten your shower. Save water and power. Every minute of a shower uses the equivalent of 12 bottles of water.
  - (Dorms only) Make it a quickie. Every minute of a shower uses the equivalent of 12 bottles of water.

*Overcoming other barriers*
- The University of California and Berkeley installed UZLOW valves onto showerheads so students can reduce the flow of water when soaping, shaving or shampooing. According to a resident survey, 82% of students in the target residence halls (Christian and Slottman) used the valves at least 20% of the time – leading to estimated savings of over 130,000 gallons of water.

*Impacts Not Measured*
- Some spas and sports facilities put automatic shutoff valves on showers. The showers turn off after a given time or volume then can be re-started if desired.

*Other lessons learned*
- The University of Florida found that sand timers were easy to use and well received, but they were too easily knocked down, broke and water leaked into them. One participating student suggested having a sound alarm as well.
- UC Berkeley installed UZLOW valves onto showerheads which enables students to reduce the flow of water when soaping, shaving or shampooing. In the low position, the valve allows just enough water to flow to maintain the original temperature.
- The University of Toronto’s ReWire Program targets shorter showers in April. At the start of each month, volunteers pick up the prompts from the Sustainability Office and they put them up on their floors. They talk to their peers and neighbours at the monthly floor meetings they have to discuss the goals of the month. Then it is up to them, for the rest of the month, to talk about the theme and actions with their peers whenever they get the chance, as well as hold events. During the time of the program, shower times increased instead of shortened.
- Oberlin College found that “reductions in water use were considerably less than reductions in electricity. Between baseline and competition periods, the overall per capita rate of water consumption fell from 37 to 35 gal/student/day. This 3 percent reduction amounted to a two-week savings of 20,500 gal in the 17 dormitories included in the water component of this study. The winning dormitory reduced its water consumption by 11 percent.”
- Western Washington University had to accommodate a backorder by the timer distributor
- 45% of BC residents claim to shower for no more than five minutes on any given day. The national average is around 40% overall, but those aged 16 to 34 the average dips to 25%. The average also dips in urban communities compared with rural communities. RBC (2012)

<table>
<thead>
<tr>
<th>Model Programs</th>
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<tbody>
<tr>
<td>UC Berkeley</td>
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<tr>
<td>University of Florida</td>
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<tr>
<td>Western Washington University</td>
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<tr>
<th>Support / Tie-In Programs</th>
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</thead>
<tbody>
<tr>
<td><strong>Do it in the Dark is the BC</strong> electricity and water reduction competition on college and university campuses. Students compete to achieve the greatest reductions in their residence halls</td>
</tr>
<tr>
<td><strong>Campus Conservation Nationals</strong> is the largest North American electricity and water reduction competition on college and university campuses. Students compete to achieve the greatest reductions in their residence halls over a three-week period</td>
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<tr>
<th>References</th>
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<tbody>
<tr>
<td>AASHE <a href="http://www.aashe.org/forums/shower-timers">http://www.aashe.org/forums/shower-timers</a></td>
</tr>
<tr>
<td>Lam, Kimberly. 2010 Grant Application <a href="http://tgif.berkeley.edu/docs/2010/application-end_the_cycle.pdf">http://tgif.berkeley.edu/docs/2010/application-end_the_cycle.pdf</a></td>
</tr>
</tbody>
</table>
2.7 Turn Off Lights (in offices and residences)

The following best practices are based on what we learned from university programs to promote turning off lights (programs with measured impacts.)

- Ask participants to commit to turning off lights and provide prompts; arrange for volunteers to promote turning off lights among peers (e.g. Duke, U. Of Toronto)

In addition, it would be useful to counter low response efficacy (‘my actions won’t make much difference’) by providing inspiring feedback on what is being accomplished through turning off lights. It might also be useful to implement a Green Office certification program that requires the posting of prompts on applicable light switches (e.g. Harvard and Stanford.)

<table>
<thead>
<tr>
<th>Behaviours:</th>
<th>Turn off Lights</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td><strong>Turn off Lights</strong></td>
</tr>
<tr>
<td><strong>Lack of awareness and knowledge</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Forgetting</strong></td>
<td></td>
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<tr>
<td><strong>Benefits may accrue to the university, not the person taking action</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Low response efficacy (‘my actions won’t make much difference’)</strong></td>
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</table>
### Benefits

- Turning off lights is an easy way to do one’s part for the environment

### Awareness and education activities

<table>
<thead>
<tr>
<th>Behaviour Change strategies and tools used (and if available, measures of their success)</th>
<th>Impacts Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prompts, Pledge, Norm Appeals, Peer Support, Word of Mouth; Credible, Personalized, Empowering Communication</td>
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<tr>
<td></td>
<td>The University of Toronto’s ReWire Program targets turning off lights in November. At the start of the month, volunteers pick up the prompts from the Sustainability Office and they put them up on their floors. They talk to their peers and neighbours at the monthly floor meetings they have to discuss the goals of the month. Then it is up to them, for the rest of the month, to talk about the theme and actions with their peers whenever they get the chance, as well as hold events. Overall, the program reduced consumption by between 221 and 258 MWh in its second year when it ran in seven residences with 1,500 students. The savings were attributed to powerful pro-environmental social norms. One of the most common behaviour changes was turning off lights when leaving the common room and bathroom. “When we first started out, people got so excited that they started turning off lights in the hallways to the point to where it became a health and safety hazard.”</td>
</tr>
</tbody>
</table>

### Impacts Not Measured

**Feedback and Recognition, Norm Appeals, Peer Support**

- Green Office certification programs (e.g. Harvard; Stanford’s Building Heroes Program). Harvard’s entry level of office certification (leaf one) requires the posting of (turn off the lights) prompts on applicable light switches.

- Campus-wide awards and recognition in sustainability (e.g. Harvard’s annual Green Carpet Awards)

**Prompts**

- Some examples from Duke University
  - HELP. Save money and the planet by turning off the lights.
  - Energy = Money. Save jobs and the planet. Turn off the lights!
  - (Dorms Only) Turning off can be a real turn on. Turn off the lights to save $$ and the environment.
  - (Dorms Only) Don’t get caught turned on. Turn off the lights to save $$ and the environment.
  - (Dorms Only) Join the Dark Side. Turn off the lights to save $$ and the environment.

### Other lessons learned

-
2.8 **Wash Clothes in Cold Water** (in residences)

The following best practices are based on what we learned from university and other behaviour change programs to promote washing clothes in cold water (programs with measured impacts.)

- Correct misconceptions about the ability of cold water washing to clean and sanitize clothes, using testimonials, results from cold-water wash cleanliness tests, and information on which laundry types might need hot water. *(e.g. Action Research, 2013; UC Berkeley)*

- Provide statistics on the percentage of cold-water washers at UBC *(Action Research, 2013)*

- Provide prompts near the washing machines *(Action Research, 2013, UC Berkeley)*

In addition, it would be useful to counter low response efficacy (‘my actions won’t make much difference’) by providing inspiring feedback on what is being accomplished through use of cold water washes.

<table>
<thead>
<tr>
<th>Behaviours: Wash Clothes in Cold Water</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>• Wash Clothes in Cold Water (residences)</td>
</tr>
<tr>
<td><strong>Barriers</strong></td>
</tr>
<tr>
<td>• Lack of awareness and knowledge</td>
</tr>
<tr>
<td>• Misconceptions</td>
</tr>
<tr>
<td>○ Cold water washing doesn’t clean as well (‘looks cleaner’ and ‘smells cleaner’. Results from University of California, Berkeley’s January 2010 survey showed that students could not actually tell the</td>
</tr>
</tbody>
</table>
**Best Practices**

The difference between washing with hot vs. cold-water cycles:

- Regular hot washes are required for good sanitation (allergies and/or killing bugs and germs)

- Forgetting
- Inconvenience; may need to find and use special detergent
- Benefits may accrue to the university, not the person taking action
- Low response efficacy (‘my actions won’t make much difference’)

**Benefits**

- Washing with cold water prevents heat fixing of stains and reduces the amount of wear and tear, allowing clothes to last longer
- Many clothes maintain their shape better when washed in cold water
- Uses less energy / good for the environment

**Awareness and education activities**

According to Marbek (2007):

- In an energy conservation program aimed at changing the behaviour of families on a U.S. military base, only 13% used cold water wash for washing clothes after being advised to do so.

- A UK study on the efficacy of energy advice found that 45% of the surveyed population of 1900 respondents recalled receiving energy advice on kitchen or laundry end uses, and of these, 17% said they had changed their behaviour by doing washes at lower temperature

**Behaviour Change strategies and tools used (and if available, measures of their success)**

**Impacts Measured**

- Testimonials, norms, credible communication, prompt
  
  - Action Research used testimonials from cold-water washers living in the pilot areas, a letter from the city asking residents to wash their laundry in cold water, results from cold-water wash cleanliness tests performed on detergents by Consumer Reports, and the percentage of cold-water washers to overcome misconceptions about the ability of cold water washing to clean and sanitize clothes. It also informed residents which laundry types might need hot water, and provided a prompt magnet. It targeted residents who paid at least part of their own utility bills. The campaign increased the number of people using all or mostly cold-water washes (85% vs 52% for the control group in one community, 79% vs 60% in another community, and 76% vs 59% in a third community.)

**Impacts Not Measured**

- Prompts
  
  - Examples of a prompt from Duke University: Give your laundry the COLD shoulder. Heating water accounts for 90 percent of the energy used to wash clothes.
  
  - University of California, Berkeley uses posters and static-cling laundry
| Other lessons learned | According to Marbek (2007):

- A variety of baseline data on wash temperature practices is available. In the U.S., 28% of consumers with washing machines washed in cold water and 66% rinsed in cold water, compared to 50% warm water wash and 20% warm water rinse, and 6% hot water wash and 1% hot water rinse (EIA 2003). In the UK, polled as to personal energy habits, 44% of Britons said they washed clothes at 60°C at least once a week and 15% said they wash clothes at 90°C at least once a week (UK Energy Saving Trust 2006).

- There has been a trend toward more cold-water washing in the UK and North America, sustained by trends in fabric and fabric care labels and by market promotion of cold-water wash detergents. For example, the percentage of wash at 90°C or above has declined from 25% to 7% over 30 years (Shove 2003). But washing frequency seems to have also increased, buoyed by changing standards of cleanliness (Shove 2003) and by a decline of awareness or attractiveness of spot cleaning and airing as alternatives to full wash (Linden et al. 2006).” |

| Model Programs | • University of California, Berkeley
 • USDN and Action Research’s pilot in four communities |

| Support / Tie-In Programs | • |


International Association for Soaps, Detergents and Maintenance Products (AISE) Life Cycle Analysis (LCA) Task Force. The A.I.S.E. Code of Good Environmental Practice: The “Washright” Campaign

2.9 Build a Culture of Sustainability (all settings)

In addition to specific strategies and tools that focus on particular behaviours and are addressed elsewhere in this report, there are a number of strategies and tools that can help more broadly to build a culture of sustainability on campus. These are summarized below. Their impacts have not been measured.

- Use a distinctive umbrella brand and logo related to sustainability that ties together the individual behavioural strategies and tools.

- Develop campus master plans and environmental policies that frame sustainable actions as mission-centered, that provide goals, objectives and related budgets for environmental initiatives, and that integrate environmental planning and action into the universities’ regular business planning and implementation processes.

- Maintain an office of sustainability and working committees overseeing environmental activities. While it adds credibility for these to be led by a senior faculty member, it also helps to have collaborative, consultative, ground-up decision-making processes that directly involve front-line personnel and students representing a cross-section of faculties and departments. (e.g. Duke U., Harvard U.)

- Use Green Teams and consider use of a Green Team leaders’ network. Consider implementing a transcript annotation system for rewarding and encouraging volunteers (e.g. UC Davis)

- Make sustainability the default setting (i.e. the easy and normal thing to do across the board) for administration, trustees, and campus operations. Operationally, that may require changes in the incentive structure to include life cycle costing, energy analysis, and in cases where economics is not the appropriate metric, rigorous ethical considerations pertaining to what is bought, built, installed and maintained.

- Encourage or require departments to set their own sustainability goals as part of their regular business planning processes (e.g. University of Colorado)

- Integrate with campus health promotion activities (e.g. UC Berkeley)

- Use healthy competition, accountability, and public displays of sustainability (Making it visible, making it "everyday" and making it count.)

- Provide ways for involved folks to see the consequences of their actions quicker. (e.g. Elon U.)

- Provide campus-wide sustainability awards and recognition ceremonies (e.g. Harvard U.)

- Come from a place of positivity, not guilt or shaming. Celebrate small successes. Use “appreciative inquiry”-- find out what is right and what is working and highlight it, make it the norm.
• Integrate sustainability education into new student and new staff orientations. (e.g. Duke, Harvard, Elon, UC Davis, Stanford).

• Provide departmental and supplier education of green practices, products and social responsibility (e.g. Duke)

• Provide revolving loans and grant funds that help finance on-campus sustainability projects (e.g. Duke U., Oberlin College, UC Berkeley)

• Promote and assist with the integration of sustainability content into the curriculum (e.g. Dickinson University). Consider funding / providing incentives for developing sustainability courses (e.g. Dickinson College.)

• Promote and assist with sustainability research, and consider providing grants for carrying it out (e.g. Dickinson College)

• Holding an annual sustainability conference (e.g. UC Berkeley)

• Introducing Green Labs and Green Office Programs (e.g. University of California, Harvard U. and University of Colorado).

• Follow progress with the Green Room approach to see if it merits replication at UBC (e.g. Elon U. And Indiana U.)

• Follow progress with Oberlin College’s Connectedness with Nature” (CNS) Scale.

## Build a Culture of Sustainability

<table>
<thead>
<tr>
<th>Behaviour Change strategies and tools used (and if available, measures of their success)</th>
<th>Impacts Not Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A distinctive umbrella brand and logo related to sustainability that ties together the individual behavioural strategies and tools. Many universities have this.</td>
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<tr>
<td>• Campus master plans and environmental policies. These set an institutional context that frame sustainable actions as mission-centered (why does what we are asking you to do or change matter in terms of living out the university's vision?) They usually provide goals, objectives and related budgets for environmental initiatives and integrate environmental planning and action into the universities’ regular business planning and</td>
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In addition to specific strategies and tools that focus on particular behaviours and are addressed elsewhere in this report, there are a number strategies and tools that can help more broadly to build a culture of sustainability on campus. These are summarized below.
implementation processes. In doing so they also focus attention on and add credibility to these initiatives. Many universities have these.

- **Offices of sustainability and working committees** overseeing environmental activities. While it adds credibility for these to be led by a senior faculty member, it also helps to have collaborative, consultative, ground-up decision-making processes that directly involve front-line personnel and students representing a cross-section of faculties and departments. (e.g. Duke U., Harvard U.)

- **Green Teams, Green Team leaders’ networks**, with a transcript annotation system for rewarding and encouraging volunteers. (e.g. UC Davis)

- **Making sustainability the default setting** (i.e. the easy and normal thing to do across the board) for administration, trustees, and campus operations. Operationally, that may require changes in the incentive structure to include life cycle costing, energy analysis, and in cases where economics is not the appropriate metric, rigorous ethical considerations pertaining to what is bought, built, installed and maintained.

- **Encouraging or requiring departments to set their own sustainability goals** as part of their regular business planning processes (e.g. University of Colorado)

- **Healthy competition, accountability, and public displays of sustainability** (Making it visible, making it "everyday" and making it count.) Many universities participate in internal and/or external sustainability competitions and report their sustainability progress both internally and externally. Sustainable cafeteria / food service / waste reduction practices and related promotion provide frequent opportunities for public displays of sustainability.

- **Strong feedback loops**. Provide ways for involved folks to see the consequences of their actions quicker. Energy dashboard systems, meters that show water usage in real time, etc. have been demonstrated to curb wasteful behavior (e.g. Elon U.)

- **Campus-wide sustainability awards and recognition ceremonies** (e.g. Harvard U.)

- **Coming from a place of positivity, not guilt or shaming.** Celebrate small successes. Use "appreciative inquiry"-- find out what is right and what is working and highlight it, make it the norm.

- **Green Labs Program.** These programs provide a place where scientists on campus can go about sustainability issues, and provide them with a collective voice. (e.g. University of California, Harvard U. and University of Colorado)

- **Green Office Program** (e.g. Harvard U.)

- **Green Room Program** (e.g. Elon U., Indiana U.)

- **New Student Orientations.** These orientations set the tone, help to raise
awareness and build positive attitudes, provide assistance and help create new habits at a time when students are most receptive to change.

Components can include:

- Information on how to pack, move-in and furnish sustainably in orientation materials (e.g. Duke U., Elon U)
- Move-in recycling drive (e.g. UC Davis)
- Model residence rooms highlighting sustainability features (e.g. Duke U.)
- Giveaways that serve a prompts for and symbols of sustainable living (e.g. reusable water bottles; re-usable food to-go container, e.g. Elon U.)
- Zero waste meals (e.g. Oregon State U., UC Davis)
- Follow-up with opportunities to get more involved (e.g. U of Calgary)

- **New Employee Orientations.** These orientations set the tone, help to raise awareness and build positive attitudes, provide assistance and help create new habits at a time when new employees are most receptive to change. For example, new employees in most of Harvard’s schools receive a sustainability brochure tailored to their school at orientation, and slides pertaining to sustainability are incorporated into orientation slideshows. (e.g. Dickinson College, Duke U., Harvard U., Stanford U.).

- **Departmental and Supplier Education of Green Practices, Products and Social Responsibility** (e.g. Duke U. holds monthly Green Vendor and Diverse Supplier networking events)
- Revolving *loans and grant funds* that help finance on-campus sustainability projects (e.g. Duke U., Oberlin College, UC Berkeley)
- **Annual sustainability conference** (e.g. UC Berkeley)
- **Integration with campus health promotion activities** (e.g. UC Berkeley)
- **Strategic integration into curriculum content** (e.g. Dickinson University). Funding / incentives for developing sustainability courses.(e.g. Dickinson College)
- **Sustainability research and grants for carrying it out** (e.g. Dickinson College)

**Other lessons learned**

- Oberlin College has developed a *Connectedness with Nature“ (CNS) Scale* that it has found to be the best overall predictor of conservation-related behaviors. It believes that affecting CNS is an important factor in building an overall culture of sustainability.

**Model Programs**

- Dickinson College
- Duke University
- Harvard U.
- UC Berkeley

| Support / Tie-In Programs |  
|--------------------------|---|
|  | • AASHE STARS  
|  | • Climate Positive Development Program, an initiative of the William J. Clinton Foundation's Clinton Climate Initiative and the U.S. Green Building Council (e.g. Obelin College)  
|  | • American College and University Presidents’ Climate Commitment (ACUPCC) (UC Davis)  

| References |  
|------------|---|
|  | http://www.greenreportcard.org/  
|  | https://stars.aashe.org/  


3. Goals and Methodology

3.1 Review Goals
The overarching goals of the best practice review were to:

- identify comparable campus and other institutional sustainability projects and programs that have achieved significant and measured impacts on the targeted behaviour changes through the use of social marketing techniques
- Identify barriers and benefits of the Target Behaviours to provide a basis for barrier and benefit research specific to UBC
- Identify program elements that have been successful
- Identify lessons learned and advice for UBC

3.2 Methodology
The project team conducted a literature review of key learnings from other projects focused on similar behaviours, settings and/or target populations. The team focused on programs with measured impacts, to increase confidence in the value of the tactics, tools and approaches used. It also focused on materials available from the web and internal collections, supplemented by requests for suggestions from related listservs.

In addition, the team conducted written interviews and reviews with three experts on developing a campus culture of sustainability. They are:

- Bridget Flynn, Sustainability Coordinator at Oberlin College
- David Orr (Paul Sears Distinguished Professor of Environmental Studies and Politics and Special Assistant to the President of Oberlin College.)
- Jay Roberts (Associate Professor of Education and Environmental Studies where he directs the Center for Environmental Action at Earlham College)

Drafts of the project’s work-in-process were reviewed by Campus Sustainability’s staff and Steering Committee, and by LURA Consulting.

The findings have been compiled into a set of summary charts and a detailed listing of the relevant information found. These are all contained within the Appendix. This report summarizes the key findings.