This form is only for nominations in the Student Energy Efficiency category
This award will spotlight a program, organization, or group that has demonstrated real leadership in student-led energy efficiency and conservation efforts. Award candidates will be engaged in campus activities that seek to leverage student interest and commitment to sustainability in order to increase energy awareness on campus; realize environmentally-friendly campus policies and commitments; and involve students in efficiency activities that compliment their campus’ goals and that result in measurable energy savings.

I. Contact Information

1. Campus UC Berkeley
2. Contact name/title Maia Kapur, Team Manager
3. Telephone 206 388 6526
4. E-mail kapur.mr@gmail.com

II. Project Information (a student group may submit a single nomination for up to three discrete projects)

1. Project name(s) Fight the Flow
2. Project location(s) Two dormitory buildings in Unit 1 housing complex; dormitory buildings in Unit 2 housing complex (underway) University Village Family Housing Complex (underway)
3. Implementation period(s) Spring 2012 and ongoing
4. Brief narrative description of project goals and strategies (300 – 400 words)

The Fight the Flow project was created to install UZLOW shower valves to reduce water consumption and energy use in the residence halls, as compared to a baseline set by a campus-wide water audit performed in 2009. When in use, the UZLOW valve reduces both water consumption and the natural gas used to heat water by decreasing hot water flow when shampooing, shaving, or soaping up. In this “low” position, the valve reduces the volume of water released; the transition between the low and regular flow does not cause the temperature to fluctuate. There are no bursts of cold water when switching back to a regular flow, making this a popular option for residents. The net savings from the valves is also high due to the mechanical nature of the technology. Concurrently, our team designed a promotional outreach campaign to educate residents on how the valves are used and their water- and energy-saving benefits. Incentives such as organic shampoo, soap, and shower timers were distributed at tabling events to increase education and use of the valves.

The original installation consisted of 124 valves in two residential buildings in the “Unit 1” dormitory complex, 2 blocks south of main campus. Since then, the success of the original project has inspired the current expansion into another student residential building called “Unit 2”, in addition to University Village, a family housing complex in Albany (installation currently underway). The University Village pilot program reaches 50 graduate student families and was
Fight the Flow (UZLOW)

awarded a separate, $16,000 grant in the spring of 2012, which was co-authored by several PowerSave interns.

5. Project budget(s): This project received a grant through UC Berkeley’s “The Green Initiative Fund” for an initial cost of $3696. We have since applied for and received subsequent “mini-grants” totaling an additional $2000.

6. Estimated annual energy savings (kWh, therms)
Project savings for the two residence halls in Unit 1 alone were as follows: Current Unit 1 showerheads use 2.0 gallons per minute (GPM). UZLOW valves would reduce flow to .31 GPM, a savings of 1.69GPM. The UZLOW is used an average of 3.5 minutes per shower for a savings of 5.9 gallons per shower. An estimated 40% of over 2000 residents use the valves, saving over 571,000 gallons of hot water, and 1,875 therms over the 2 year project lifespan. This is equal to $4,445 saved in water and heating costs and 26,408 lbs. of CO₂ emissions diverted. This project will help UC Berkeley reach its goal of attaining 1990 GHG emission levels by 2014.

7. Estimated annual cost savings (please state assumptions for electricity and gas rates)
Our calculations projected a savings of $4,445 in water and heating costs, which correlates with a payback of less than 1 year. Assumptions below.
Assumptions

<table>
<thead>
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<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>PG&amp;E Cost per kWh</td>
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<tr>
<td>PG&amp;E Cost per therm</td>
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</tr>
<tr>
<td>Utility cost per gallon H₂O</td>
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<tr>
<td>Pounds CO₂ emitted per kWh</td>
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</tr>
<tr>
<td>Pounds CO₂ emitted per therm</td>
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<tr>
<td>Utility Cost per CCF of H₂O</td>
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<td>Domestic water temp (Deg F)</td>
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<tr>
<td>Domestic water temp at tap (Deg F)</td>
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</tr>
<tr>
<td>Percentage of hot water used in faucets/showers</td>
<td>75%</td>
</tr>
<tr>
<td>Efficiency of water heating system</td>
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Conversions

<table>
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</thead>
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<tr>
<td>1 CCF</td>
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</tr>
<tr>
<td>1 kilowatt</td>
<td>1000 watts</td>
</tr>
<tr>
<td>1 therm</td>
<td>29.31 kWh</td>
</tr>
<tr>
<td>1 gallon water</td>
<td>8.34 pounds</td>
</tr>
</tbody>
</table>

8. **Describe project results other than energy savings that demonstrate its impact on your campus (200 word limit).** Our tabling efforts and outreach programs have led to an increased awareness of water-saving methods and simple behavior changes to increase at-home sustainability amongst student residents. Due in part to this project’s success, representatives from other housing complexes off and on campus (namely University Village (UV), the faculty, and family housing development) have reached out to our organization in interest of installing the valves. This installation will not only save energy and water, but also actively foster a growing interest and capacity to conserve water and resources. In response to a post-installation survey distributed to Unit 2 residents, over half of the respondents indicated a significant behavior change by agreeing with the statement “I use the UZLOW valve at least twice a week.” Over the course of our outreach campaign we introduced more than 500 residents to the valve and encouraged the importance of water conservation. Another significant subset of respondents indicated that they “are now conscious of the environmental consequences” of using excessive amounts of hot water while showering.

9. **Relevancy to the Best Practice Program – Please provide a detailed narrative of the project(s), highlighting those project features that qualify it as a best practice readily replicable on other campuses (800 word limit).**

“Fight the Flow” is a project designed and implemented exclusively by the students of the Berkeley PowerSave Campus Program. The Berkeley PowerSave Campus team consists of
seven interns and several for-credit volunteers who reach thousands of students every year through their projects and outreach endeavors. Interns work to save energy on campus by increasing general awareness of energy efficient lifestyle changes, incorporating energy conservation and efficiency into course curricula, and implementing projects targeting energy use, student purchasing decisions of consumer goods, and operational changes. Many projects involve encouraging behavioral changes in the residence halls and on campus by staging competitions; we also perform lighting audits and energy consumption analyses to calculate potential savings and retrofit opportunities. The Alliance to Save Energy's PowerSave Campus Program is a state-wide energy efficiency internship opportunity at 16 UC and CSU campuses that works to bridge the gap between students, faculty, state and institutional energy costs. The program is funded primarily from public utilities including PG&E, Southern California Edison, Sempra Energy and the Southern California Gas Company.

This project is exceptional in that it encompasses multiple dimensions of conservation: hard savings, participant education and ongoing outreach. It is also an excellent example of how a relatively inexpensive retrofit can truly enhance a building’s efficiency rating. In addition, this project has exceeded its original intentions in that the UZLOW showerhead valve installation has, in response to the success of the first stage of the project, expanded into other housing complexes. The residence halls are of particular interest in that the majority of water that exits these buildings is “grey water”, and from 1990 to 2009 the residence halls displayed a 10% increase in water usage; however, the 571,050 gallons of water saved by Fight the Flow per year returned the building’s gallons/water/year usage to the 1991 level in less than one year.

The key advantage of targeting residence halls is that it attunes residents (mostly freshmen) to water and energy saving practices early in their college career. Instead of saving water by simply installing the valve, our outreach campaign assured that students were voluntarily using the valves, fully understanding the benefits of their actions. A post-installation survey confirmed this result, with 85% of respondents claiming they used the valve after learning its savings potential, via posters or tabling events. Even better, the reach of these showerheads is increasing, with expansion of this project into graduate family housing in University Village, and potentially other locations.

This project is in line with many of the sustainability goals outlined by the UC Campus Sustainability Plan. “Fight the Flow” addresses two of the emissions sources that UC Berkeley tracks, according to the 2009 Cal Climate Action Plan: water use and natural gas consumption. In order to reach the campus’ goal of 1990 GHG emissions levels by 2014, UC Berkeley needs to continue implementing diverse projects sponsored not only by departments and staff/faculty, but also by student groups. Through the drive and innovation of our student organization, we were able to generate a conservative project at no additional cost to the university that will actually save money.

This aspect of empowerment is crucial to our organization’s larger aim of getting students excited about conservation, and meeting and exceeding campus and statewide standards of energy reduction. The Fight the Flow campaign is ideal in that it encapsulates multiple
elements of sustainability by educating and encouraging energy-saving behaviors in students while yielding hard metric savings through water conservation.

10. **Collaborative design and implementation** – Describe the way in which this project incorporated stakeholders from multiple disciplines into the project’s design and implementation. Describe how this collaboration produced sustainable solutions and improved the project’s performance (500 word limit).

This project required collaboration from the Office of Sustainability and Residential Student Services Program. These stakeholders provided vision, cohesion and advice for popularizing the project, in addition to managing our grant funding. Having the support of sustainability leaders on campus placed the UZLOW project in the larger context of conservation efforts on campus. Around the same time that Fight the Flow was gaining traction, another grant-receiving project entitled “Take Back the Tap” (that aimed to reduce waste from water bottle consumption) was also underway; our organization agreed to table in tandem with this student group. Doing this encouraged residents to examine multiple aspects of their water consumption, and synchronized the branding of both campaigns. The project required the technical advice, assistance and flexibility of the multiple energy managers and building staff to execute the retrofit. Key members of residential staff supplied the PSGC team with baseline data on energy consumption, and provided advice instrumental in this project’s implementation. In the original grant submission obtained authorization from Jeff Urdahl the facilities manager for the housing complex, to go forth with the valve implementation.

11. **Load management** – Describe how the project provides on-peak electricity demand reduction, or demand response capability (200 word limit).

Most students shower in the morning or evening, which are both high-demand times for the utilities. The UZLOW attachment reduces a subset of the energy and water use during these periods, which are especially burdensome on the campus infrastructure due to the dense nature of residential complexes. Additionally, the use of UZLOW device decreases the energy differential created when residents switch water quickly from hot-to-cold, as the valve retains the warm water temperature without releasing it.

12. **Describe how the project has been received by campus stakeholders. Describe what has been met with satisfaction or dissatisfaction, and why (200 word limit).**

Campus stakeholders have been highly receptive to the project, and we have been invited to present at multiple poster sessions and sustainability club meetings since its completion. The Green Initiative Fund grant features the project on its website where interested stakeholders can review our proposal, detailed project metrics and contact information. Those that have contacted us express satisfaction with our identification of a simple yet significant problem – hot water usage in residential showers – and our multifaceted approach to solve it. Initially, a few of the facilities managers recommended that we make efforts to educate residents exactly how to use the valves, as some were expressing confusion.. Such feedback was directly incorporated into future outreach and educational efforts.

Representatives from the University Village, an off-campus housing complex for faculty and families, approached us in spring of 2012 to develop a plan for additional installations. We
Fight the Flow (UZLOW)

helped them write a large grant to fund the installation of valves and other retrofits. Additionally, the grant-giving body (TGIF) awarded us a second grant in fall of 2012 due to the positive reception by campus staff and stakeholders.

13. If applicable, describe how you collaborated with members of your local or regional (off-campus) community in implementing your project (200 word limit). UZLOW LLC is a small, locally owned company that has helped immensely in the development and implementation of this project. Philip Bautch (owner of UZLOW) accommodated our large orders and has subsequently received large requests from other campuses pursuing similar retrofits. An additional grant-giving body (playGREEN) awarded the project a $500 mini-grant and asked to interview which Maia Kapur (author of the original proposal) for an informational video for their grant website. At the time, playGREEN was a new grant on campus based in the privately-managed Recreational Sports Facility – this grant and interview provided our project with exposure and drew other sustainability-minded projects to the playGREEN fund. As mentioned above, we were approached by a community member and resident of University Village (in Albany, CA) who was interested in writing a large grant to retrofit the family housing complex. We encouraged her to allot funding for UZLOW valves and consulted her throughout the application process; she received a grant for over $16,000 last spring and the valve shipment is arriving in mid-march, 2013.

III. Additional information

Please provide up to three additional files (total) to assist the selection committee in understanding and evaluating the project. Visuals such as pictures or videos are strongly encouraged.
Attachment 1: Informational Poster. These were hung on the entrances to shared bathrooms in residence halls.
Attachment 2: CACS Poster. This poster was presented at a project poster session in Spring 2012.

IV. Speaker bio

Please submit a brief speaker bio or bios (80 word limit; limit two speakers per project).

Maia Kapur is an undergraduate entering her 4th year at at UC Berkeley, and has worked with PowerSave campus as an intern since 2010 and as manager since 2012. She is pursuing a Bachelor’s in Environmental Science with an emphasis on tropical marine ecology. Her interests in sustainability include wastewater treatment, demand-response technology, and clean energy for the developing world.

Speakers will present at the Sustainability Conference if their project is selected for a best
**Fight the Flow (UZLOW)**

*Practice Award. Speaker bios will appear in the conference program.*

*At least one of the speakers listed here must be a student. Co-presenters from non-campus entities (e.g. architecture firms, consultants, etc.) are permitted.*

V. Nomination submittal

Send completed Nominations to Rashmi Sahai, Sustainability Specialist at the University of California Office of the President (rashmi.sahai@ucop.edu). All submittals must be received by 6:00 p.m. on March 8th, 2013, **no exceptions**.

Answers to frequently asked questions can be found at: [http://www.cahigheredusustainability.org/cahigheredusustainability/awards/faq.aspx](http://www.cahigheredusustainability.org/cahigheredusustainability/awards/faq.aspx).

Please direct any other questions to Rashmi Sahai, (510) 587-6225.