STUDENT SUSTAINABILITY COMMITTEE

Funding Application – Step II

Funding Criteria

A. General Rules

1. Students, faculty, and staff are encouraged to submit requests for funding. Student-led projects require a faculty or staff sponsor in order to have funds awarded.
2. Funding can only go to university-affiliated projects from students, faculty, staff, and departments.
3. All SSC projects must make a substantial impact on students. This may be a direct impact or an impact through education and engagement. All SSC funding is 100% from student green fees, so the projects funded by the students must benefit them.
4. SSC encourages innovation and new technologies – creative projects are encouraged to apply.
5. Unless a type of expense is specifically listed below as having restrictions, SSC can generally fund it. The items referenced below should not be taken as comprehensive list.

B. Things SSC Can Fund, On A Case-By-Case Basis

1. SSC can fund feasibility studies and design work; however, it must work toward ultimately addressing a sustainability need on campus.
2. SSC can fund staff positions that are related to improving campus sustainability. Strong preference will be given to proposals receiving matching funding from departments and/or plans for maintaining continuity of the position after the end of the initial grant.
3. SSC can fund outreach events with a central theme of sustainability, provided their primary audience is the general campus community.
4. SSC discourages funding requests for food and prizes but will consider proposals on a case by case basis that prove significant reasoning.
5. SSC can fund repairs and improvements to existing building systems as long as it works toward the goal of improving campus sustainability; however, a preference is shown to projects utilizing new or innovative ideas.
6. SSC can provide departments with loans for projects with a distinct payback on a case by case base. Loans will require a separate memorandum of understanding between SSC and departmental leadership pledging to repay the award in full and detailing the payback plan.

C. Things SSC Will Not Fund:

1. SSC will not fund projects with a primary end goal of generating revenue for non-University entities.
2. SSC will not fund personal lodging, food, beverage, and other travel expenses.
3. SSC will not fund any travel expenses.
4. SSC will not fund tuition or other forms of personal financial assistance for students beyond standard student employee wages.

Your Step 2 funding application should include this application, the supplemental budget form, and any letters of support.

Please submit this completed application and any relevant supporting documentation to Sustainability-Committee@Illinois.edu. The Working Group Chairs will be in contact with you regarding any questions about the application. If you have any questions about the application process, please contact the Student Sustainability Committee at sustainability-committee@illinois.edu.

General & Contact Information

Project Name: : Effectiveness of feedback in reducing water and energy use in residence hall showers.
Total Amount Requested from SSC: $9,972 (35 meters @ $50/meter; 3.6 months of graduate research assistant salary @ $2284/month)

Project Topic Areas: ☒ Land & Water ☐ Education ☒ Energy
☐ Transportation ☐ Food & Waste
Applicant Name: Vica Otrubina
Campus Affiliation (Unit/Department or RSO/Organization): Graduate student at the Department of Civil and Environmental Engineering under the Stillwell Research Group (SRG)
Email Address: votrub2@illinois.edu

Check one:
☐ This project is solely my own ***OR***
☒ This project is proposed on behalf of (name of student org., campus dept., etc.): Stillwell Research Group

Project Team Members

Name	Department	Email
Vica Otrubina	CEE/SRG	Votrub2@illinois.edu
Name		
Name	Department/Organization	Email Address

Student-Led Projects (Mandatory):
Name of Faculty or Staff Project Advisor: Dr. Ashlynn S. Stillwell
Advisor's Email Address: Ashlynn@illinois.edu

Financial Contact *(Must be a full-time University of Illinois staff member)*
Contact Name: Dr. Ashlynn S. Stillwell
Unit/Department: Department of Civil and Environmental Engineering
Email Address: ashlynn@illinois.edu

Project Information

Please review the proposal materials and online content carefully. It is highly recommended you visit a working group meeting sometime during the proposal submission process.

Please provide a brief background of the project, its goals, and the desired outcomes:

We aim to determine which methods of direct interaction with a consumer will result in significant behavioral change regarding water usage, specifically focusing on showers as events that consume significant water and energy resources. Literature often highlights the importance of financial incentives in promoting conservation behavior. However, students in residence halls lack the financial incentive to change shower durations, as they pay a flat fee for their living accommodations regardless of the water consumption. We aim to examine the effectiveness of feedback in promoting water conservation behaviors in University Housing showers. We will install individual shower meters across several residence halls and collect control data to represent baseline shower duration and water use. With this baseline, we will then implement various feedback methods to inform students regarding water usage and examine the behavior response through on-going shower water meter data collection. Different feedback approaches that have the potential to raise awareness regarding water conservation and introduce long-term behavioral change in our studied setting include:

- *Competition among floors/wings to conserve water.*
- *Continuous individual reports on water consumption.*
- *Representation of consumed water quantities in a more familiar manner, for example, equating gallons used to measures of electricity.*
- *Directly building a relationship between water usage and its effects on the environment; for example, previous research in hotels showed the effectiveness of a polar bear image on an icecap that melted during the shower duration (Staake et al., 2016)*

Project deliverables include:

- *Map of shower water meter installation*
- *Baseline and feedback-enabled shower flow and duration data*
- *Map and example images of implemented feedback methods*
- *Statistical models of feedback effectiveness*

As we learn from the results of feedback in our study, system adjustments and additional meter installations are possible.

Where will the project be located? Are special permissions required for this project site?

The project will take place across several of the University residence halls. Desired dormitory buildings include Weston, Scott, Snyder, PAR, FAR, and Allen. Building selection varies based on the advice of the University plumbing staff. A member of the plumbing staff provides access to the installed meters on weekly basis by their availability.

Other than the project team, who will have a stake in the project? Please list other individuals, groups, or departments affiliated directly or indirectly by the project. This includes any entity providing funding (immediate, future, ongoing, matching, in-kind, etc.) and any entities that benefit from this project.

This project is directly affiliated with Civil and Environmental Engineering and the Institute for Sustainability, Energy, and Environment. The project lead, Vica Otrubina, is currently supported by a Graduate Research Assistantship funded by iSEE. Additional stakeholders include Facilities and Services providing plumbing expertise and installation and University Housing providing access to residence halls.

How will this project involve and/or benefit students?

We anticipate that the students participating in the project will gain long-term water conservation habits that will aid them beyond their time at the university. Additionally, their decreased water consumption on campus is contributing to University's overall savings goals that could potentially yield in financial savings. The shower water consumption data can also be used as a real-world example dataset in CEE courses.

How will you bring awareness and publicize the project on campus? In addition to SSC, where will information about this project be reported?
As the project is progressing, we are planning to publish updates and representative data on the iCAP website through Morgan White. In spring 2023 we are planning on submitting the paper coming out of this experiment to be published in a credible scientific journal.

Financial Information

In addition to the below questions, please submit the supplemental budget spreadsheet available on the Student Sustainability Committee website. Submission of both documents by the submission deadline is required for consideration of your project.

Have you applied for funding from SSC before? If so, for what project?
N/A

If this project is implemented, will you require any ongoing funding required? What is the strategy for supporting the project in order to cover replacement, operation, or renewal costs?
Additional funding would be required to replace damaged or faulty meters. Salary for Vica Otrubina will continue to be supported by iSEE and CEE. The initial results from this study will be used in research proposals for external funding to support expanded study and meter replacement/repair.

Please include any other obtained sources of funding. Have you applied for funding elsewhere?
The current source of funding is iSEE for Graduate Research Assistant salary and start-up funds from CEE for initial meter purchase as a proof of concept. We have not applied for external funding yet, but plan to submit a proposal with the results of the initial study.

Environmental, Economic, and Awareness Impacts

How will the project improve environmental sustainability at the Urbana-Champaign campus? If applicable, how does this project fit within any of the Illinois Climate Action Plan (iCAP) goals?
Between pumping, transportation, treatment, and consumer delivery, providing water services is an energy intensive process. Drinking water and wastewater systems are estimated to contribute around 45 million tons of greenhouse gases annually (EPA, n.d). Reduced water consumption among university students yields an overall energy usage reduction associated with water processing and heating, reducing our indirect carbon footprint.

How will you monitor and evaluate the project's progress and environmental outcomes? What short-term and long-term environmental impacts do you expect?
We will continuously process participant water usage to see their response to the provided feedback. Expected short-term environmental impacts include reduced water usage among residence hall inhabitants, additionally resulting in associated energy conservation. Long-term environmental impacts include increased awareness regarding water conservation among the analyzed group, which potentially leads to more sustainable personal habits.

What are your specific outreach goals? How will this project inspire change at UIUC?
Our outreach goal is to draw student's attention to how their personal habits can play a bigger role in water and energy conservation. We hope that this project will inspire UIUC to dedicate more efforts towards education on water-energy nexus among its student body, starting with use of data in CEE courses. Additionally, we want to see habitual changes among students beyond the group studied for the project.

If applicable, how does this project impact environmental injustice or social injustice?
N/A

References:

EPA. (n.d.). Energy Efficiency for Water Utilities. EPA. Retrieved February 10, 2022, from https://www.epa.gov/sustainable-water-infrastructure/energy-efficiency-water-utilities#:~:text=Overall%2C%20drinking%20water%20and%20wastewater,systems%20can%20be%20for%20energy.

Staake, T., Tiefenbeck, V., Schöb, S., & Kupfer, A. (2016). Effects of Real-Time Feedback on Hot Water Use. Final Report on the Amphiro-PWN-study, 1-16.

Vica Otrubina <votrub2@illinois.edu>

iSEE Funding Application

Klemme, Douglas Elvin <dklemme@illinois.edu> Mon, Dec 20, 2021 at 4:12 PM
To: "Otrubina, Vica" <votrub2@illinois.edu>

To all concerned, I have been working with Vica on a water metered shower head in our housing buildings. I fully support this type of research that monitors water usage and water savings. We are approaching a cross road in this country where the supply of good safe drinking water could be a real problem for the generations behind us. The work this group is doing is not only useful but needed in learning to do our part in Housing to be better stewards with water conservation. It is my honor to help this project and study to fruition. Thanks, Doug Klemme Housing Plumber Sub foreman