**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 funding application should include this application and any letters of support.**

*Please submit this completed application and any relevant supporting documentation by the deadline listed on the SSC website to* [*Sustainability-Committee@Illinois.edu*](mailto: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.*](mailto:Sustainability-Committee@illinois.edu.)

**General & Contact Information**

**Project Name:** Hydrologic

**Total Amount Requested from SSC:** $10,000

**Project Topic Areas:**  Land & Water  Education  Energy

Transportation  Food & Waste

**Applicant Name:** Vihaan Kalaria

**Campus Affiliation (Unit/Department or RSO/Organization):** Illinois Enactus

**Email Address:** vihaank2@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.): Illinois Enactus

**Project Team Members**

|  |  |  |
| --- | --- | --- |
| **Name** | **Department** | **Email** |
| Graham Louthan | Hydrologic, Illinois Enactus | gnl2@illinois.edu |
| Nathan Levandovsky | Hydrologic, Illinois Enactus | nathanl5@illinois.edu |
| Vihaan Kalaria | Hydrologic, Illinois Enactus | vihaank2@illinois.edu |
| Name | Department/Organization | Email Address |

**Student-Led Projects (Mandatory):**

Name of Faculty or Staff Project Advisor: Mark Smith  
Advisor’s Email Address: smithmk@illinois.edu

**Financial Contact *(Must be a full-time University of Illinois staff member)***

Contact Name: Mark Smith

Unit/Department: Department of Finance

Email Address: smithmk@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 want to know: What is your project? What does it concretely produce, accomplish, or solve? Why is this project needed on campus?*

Hydrologic is a project within Illinois Enactus, a registered 501(c)3 nonprofit. Hydrologic aims to implement low flow showerhead technology into University Housing, the housing department at UIUC to bring attention and action to the conservation of water on the University of Illinois at Urbana Champaign campus. The goal of this project is to create a custom low-flow and leak resistant shower head that the university can adopt in place of their current standard dormitory shower heads. By introducing a new low-flow shower head to the university dorms, we hope to educate university residents of the benefits of low-flow shower heads while not diminishing their shower experience -- thereby furthering the conversation of water conservation. Concurrently, our project would reduce the university’s water consumption and in parallel their water bill and the environmental impact the school has.

As of 2020, the Lincoln Avenue Residence Hall consumed 5,880 kilogallons of water over the one year -- according to the university’s Energy and Billing System -- and for better reference the average person will drink ~200 gallons of water over a year. We strongly believe that our custom low-flow shower head will be the perfect innovative solution for the university to reduce their water consumption while providing residents with a positive showering experience. We are striving to create a custom shower head that utilizes 40% less water than the currently used shower heads. Consequently, the university would be capable of reducing their water consumption by 860,000 gallons per day with a campus wide implementation. As the world becomes more environmentally conscious and water becomes even more scarce of a resource, the university will be in need of different methodologies to reduce their water consumption, and we believe we have the perfect solution for this need.

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

*If special permission is required for this location, please explain and submit any relevant letters of support with the application. SSC cannot fund projects without prior location approval.*

**Current Project Testing Site: Illinois Street Residence Halls (ISR) located at 1010 W Illinois St, Urbana, IL 61801**

**Over the course of last fall and this spring, the project has solidified its partnership with University Housing. Currently, University Housing has given us permission to implement our pilot testing program in the ISR housing, scheduled for April 2021. This permission allows for the Hydrologic team to test our new custom low-flow shower heads in the ISR Hall to see if our shower head is up to the standards of the residents as well as the university.**

**We are anticipating a successful pilot implementation within the next 2 years allowing us to strengthen our relationship with University Housing so we may expand our low-flow shower head to more dorms. The pilot program will involve the direct utilization of student opinions and experiences using the Hydrologic showerhead and thereby also lead to an opportunity of education and behavioural change about water consumption on campus.**

**In the long term, as our product and project makes refinements, we intend to expand our locations to other University Housing dorms across campus and recreational facilities like the ARC and CRCE.**

**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.**

*Please attach letters of commitment or support at the end of the application.*

The university will be the main beneficiary of these shower heads considering the significant reduction in water consumption and reduced water and energy bill. Moreover, students will be most directly affected by these low-flow shower heads, as such, they have a stake in the project. We believe the combination of both a positive experience with a low-flow showerhead as well as newly gained knowledge about water conservation can empower students to make small but impactful water conservation lifestyle changes. We are also working towards a better experience and more sustainable environment for the future prospective students that will attend the University of Illinois.

Additionally, Hydrologic has been incubated by Illinois Enactus throughout its project life cycle. The project has benefited from the organization’s diverse member base and impact in the campus community.

**How will this project involve and/or benefit students?**

*This includes both direct and indirect impact.*

**The group that will predominantly come into contact with the low-flow showerheads on a regular – if not daily – basis will be the student body residents living in the university housing units. This student body population gains the educational benefit of experiencing low-flow shower heads as well as gaining increased peace of mind of having a comfortable shower experience. The second beneficiary being the university itself, most prominently the financial benefit that the school receives from the reduced water consumption correlated with shower usage.**

**The largest benefit of the low flow showerhead is that students within University Housing will experience the same or even better shower experience while reducing their ecological footprint whether they realise it or not. Our hope is to increase awareness about individual’s water habits through educational efforts such as social media and infographic content, but we realize not everyone cares to the same degree about their environmental impact . As a bypass, implementing a standard low flow showerhead circumvents the personal efforts often required by individuals and creates an easy and natural solution that will ultimately benefit all.**

**Directly, the students will be able to experience and learn the benefits of low-flow showerheads through the dorms itself and the educational efforts by the project. Indirectly, by understanding and experiencing the low-flow showerheads first-hand, students would become more educated about the plethora of practical uses that conserve of water and will be able to educate others from this experience on the importance of conserving water.**

**What are your specific outreach goals? How will this project inspire change at UIUC?**

**We intend to use our pilot test as a launch point for our product. The pilot series will allow us to analyze the showerhead performance via actual users within an actual shower space for a longer period of time. This will not only allow us to reiterate any issues that arise, but also build up faith behind our product as we look to expand. Once we have established the legitimacy of the showerhead, we will begin outreach to other University dorms on campus as well as more formidable implementation into ISR, our pilot testing site. Our hope is to eventually transfer the University based shower system completely onto a low flow model. This will substantially lower the energy and water usage rates across campus as mentioned in other sections of this document.**

**Outreach after transforming the University to a low flow model will then turn into outreach into the local community public and apartment spaces. This will be to local gyms, apartment complexes, and other similar establishments. As an expansion point across the state and country, we are also anticipating outreach to other Universities as well by using our transformation of UIUC as a prior example of successful implementation.**

**As mentioned in the previous question, we believe this knowledge and awareness of student water consumption can empower students to strive for change. Once students feel that they can make a conservational impact with minimal lifestyle changes, we believe that many more students will make other small lifestyle changes for the benefit of the environment. Ultimately, leading us to believe that the implementation of our novel low-flow shower heads can not only progress the school to be more sustainable but progress the university as a whole to live more sustainably.**

**How will the project improve environmental sustainability at the Urbana-Champaign campus?**

     The university will also be benefiting from the installment of low-flow shower heads. The month of November is one of the largest water consumption months for many university housing water bills. During the 2020 financial year, Lincoln Avenue Residence Hall’s November water consumption was 830.4 kilogallons of water – costing the university $3,180 in water expenses solely for the month (based on University Facilities and Services Energy and Billing System). With our goal of reducing show head water consumption by 40%, in the case above, our low-flow shower head can lead to a savings of $1,272 or 332.16 kilogallons (332,160 gallons) of water in a single month. Over a number of months, these reduced expenses quickly grow to provide the university with consistent savings while reducing the large consumption of an already scarce resource. An additional hidden cost would be the energy consumption saved with reduced water use; consistent energy consumption is required to heat shower water, thereby increasing energy billing. With reduced water usage there is a reduced requirement of energy consumption, leading to a lower carbon footprint for the university.

**If applicable, how does this project impact environmental injustice or social injustice?**

**Hydrologic is a team comprised of university students, and we strongly feel that our actions have the ability to create change. However, when it comes to water conservation, there is not enough widespread knowledge about the issues and solutions to create a sustainable environmental impact that can be long lasting. It is unfair to place the burden of environmental change on each individual student and this is simply not a feasible solution. Instead, there should be a wider range of sustainable products on the market for large institutions, like universities, to choose from. This allows an entire community to take steps in the right direction and use less water on a larger scale. As a project, we would like to provide one such product that can be utilized across our campus dorms and recreational facilities. A simple decision from University Housing to shift towards low-flow showerheads can positively impact the environment by saving thousands of gallons of water per day without compromising the comfort of its residents. At the end of the day, each community’s environmental impact is only as potent as options they are given, and our project intends to provide this sustainable low-flow showerhead option for our University of Illinois campus.**

**Scope, Schedule, and Budget verification**

**What is the plan for project implementation? Describe the key steps of the project including the start date, target completion date, target date for submitting a final report, and any significant tasks or milestones.** *Please be as detailed as possible.*

Hydrologic officially began as a project in the fall semester of 2019 as part of Illinois Enactus’ Research and Development initiative. Our project managers have outlined three overarching phases for the project. The main steps began with a thorough needs analysis and feasibility assessment to determine the opportunity to introduce low-flow showerheads in the community. The first step focuses on market research, community outreach, partnership development, and testing of existing products in the water conservation space. This phase has been successfully completed over the past two semesters as we have had the opportunity to do research in the form of internal tests, student-facing surveys, and partnership outreach. The next step is the designing and prototyping of the ideal low-flow showerhead through an iterative process which includes brainstorming, designing, drafting, and manufacturing beta versions of the product. This is the main process within our project in which we are currently working on. As such, we are requesting grant funds to push the project through this phase and allow us the option to implement. Once the ideal showerhead has been designed and tested, the project will move to the initial implementation phase where our team will continue testing the product, make required improvements, and track metrics throughout the dorms over a prolonged period. When metrics have been recorded, final adjustments will be made and the product will be manufactured at a larger scale. We would like to have these steps effectively implemented on the University of Illinois campus by the Fall of 2022. By this date, we will have enough information to draft a final report from our implementation on the University of Illinois campus. Moving beyond, we would like to partner with other universities to see if the project can be implemented across various geographic locations. This will further our mission of raising awareness and providing a solution to water waste to the maximum amount of people possible. There are milestones within this project outline that are contingent on many external factors, and the Hydrologic team will have to be flexible throughout; however, this outline gives a detailed sense of how the project should progress over time.

**List all budget items for which funding is being requested. Include cost and total amount for each item requested.**

*Please be as detailed as possible.*

*A detailed budgeting spreadsheet can be found attached to this application.*

*Hydrologic’s budget expenses fall under three broad categories: prototyping, testing, and manufacturing.*

*Prototyping costs include materials expenses for an initial prototype of the low-flow concept. Specific material types include SLA printing, solid metals for the exterior of the showerhead, and off the shelf parts such as silicone and screws for the interior of the product. During this phase, our team will not only be testing our design concepts, but also the quality of off the shelf parts which will be used within the prototype. Quality is a primary focus for Hydrologic, and we are seeking funding to test a variety of options for inputs, regardless of input product prices. After each prototype iteration, the model will be tested for various factors including GPM and water pressure with the use of a testing rig. In order to iterate comfortably and make adjustments as needed, funding will be used to support this phase so budget restrictions do not constrain our final product. Our total allotted for prototyping expenses for this time period comes to $917.*

*Testing costs include parts to build testing equipment such as rigs. This will allow Hydrologic’s team to assess various qualities of the showerhead prototype, as well as understand the strengths and weaknesses of competing products on the market. There are two main rig types we would like to construct, a force rig and a spray pattern rig. These are set to be built in the fall of 2021, but there will be some upkeep costs for the rigs in the semesters after they are built. The total costs for testing come to $1,013.*

*Manufacturing costs include any purchases required to create the final showerhead design for sale. Parts costs are variable and span from exit plates to nozzles. Fixed manufacturing costs include shipping to obtain parts, as well as casts which only need to be made once and then can be reused in the manufacturing process. The total manufacturing costs come to $8,266 with the assumption that we will produce 160 showerheads total.*

*These expenses are subject to change depending on the prototyping iterations and design stages.*

*Total budgeted expenses for the lifespan of the project come to $10,198.*

**If the project is implemented, will you require ongoing funding? What is the strategy for supporting the project in order to cover replacement, operation, or renewal costs?**

*SSC provides funding on a case by case basis and should not be considered as an ongoing source of funding*

*Hydrologic intends to use funding as an initial source of capital for prototyping and the early manufacturing stages. We are looking into long-term funding sources which will support the project through the initial manufacturing phase. After our product is rolled out to partners for purchase, we intend to cover input costs through a sustainable method of nonprofit investments and community partnerships.*

**Please include any other obtained sources of funding. Have you applied for funding elsewhere?**

*Please attach any relevant letters of support as needed in a separate document.*

We have not obtained funding from any other sources but we are in the process of applying for grants.

**Have you applied for funding from SSC before? If so, for what project?**

Hydrologic did apply for the $750 Micro Grant Application by SSC before. Other Illinois Enactus projects which have applied for funding including Lean & Green, Circle Cycle, Stay Glassy, and Filify 3D.

**How will you bring awareness and publicize the project on campus? In addition to SSC, where will information about this project be reported?**

We are and will continue advertising the project to the campus community that will be utilizing the low flow showerhead technology. This will be important to inform and improve the student population reception to a new shower experience. Having a strong student backing will be integral when making our pitch towards larger scale implementation to University Housing, who have clearly communicated that they want a good shower experience despite low flow technology. To bring awareness and publicize Hydrologic on campus, we conducted a water usage survey with around 300 responses from University of Illinois students. From the survey we gathered residency information, water usage (shower time, laundry, washing hands etc.), shower experience (heat, pressure), and concern/consciousness (water habits concerns, knowledge of low flow showerhead technology). The survey data was used to generate the different statistics and conclusions about existing water usage habits on campus. These statements will be used to publicize the need for a water saving effort on campus as well as the feasibility of the design implementation as well. Recently, we generated the @hydrologic.uiuc Instagram that now has over 80 followers after just a couple weeks. On this social media platform, posts will be related to water conservation importance, project updates, financial benefits, and specific steps that community members can do to conserve water.

We are also partnered both with registered student organizations Enactus and Actgreen pertaining to this project. Through these organizations, we have been spreading our mission and goals across campus through their social media outlets, newsletters, and word of mouth. Both the @ilinoisenactus and @actgreenuiuc Instagrams have, and will continue, to feature Hydrologic through stories and educational posts. Additionally, we intend to carry out Zoom meetings, distribute flyers, and obtain more connections with sustainable registered student organizations. This will broaden our audience scope and gain more awareness, as well as recognition, for Hydrologic. With the continuation of marketing tactics, we will be able to bring awareness and publicize our project to the campus community.