



STUDENT SUSTAINABILITY COMMITTEE

Funding Application – Small Projects (Under \$10K)

Please submit this completed application and any relevant supporting documentation by the deadline listed on the SSC website 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 http://sustainability-committee@illinois.edu.

General Information

Project Name: "Implementation of Heating/Cooling of Bus Stops plus Mobile Electronics Charging Station via Off Grid Solar Energy System"

Total Amount Requested from SSC: \$9175.00

Project Topic Areas: [ ] Land & Water [ ] Education [x] Energy [ ] Transportation [ ] Food & Waste

Contact Information

Applicant Name: Chris Hillebrand
Unit/Department or RSO/Organization: Energy Systems Management
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Phone Number: 757-535-3859

Project Team

Table with 3 columns: Name, Department/Organization, Email. Rows include Chris Hillebrand and Joe Darga.

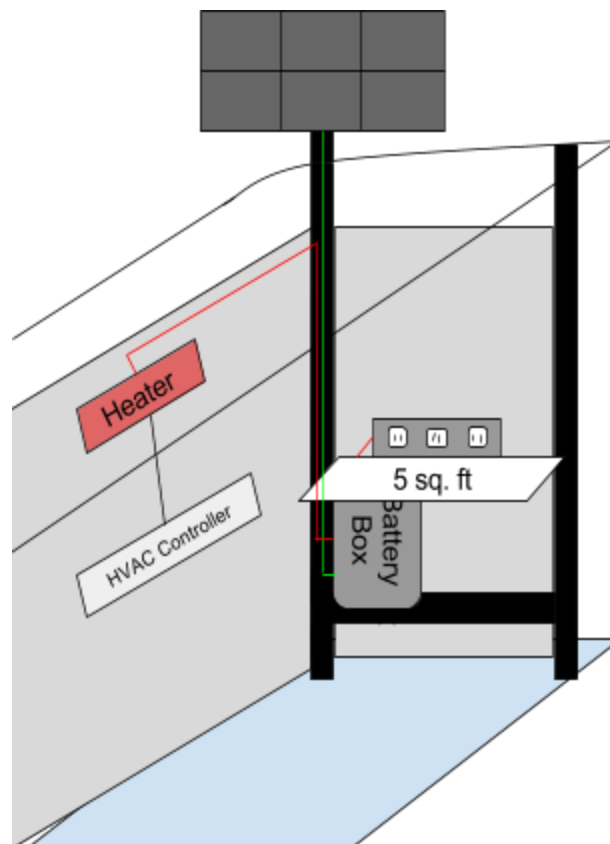
Financial Contact's Name: Dr. Rizwan Uddin
Faculty/Unit/Department: Energy Systems Management
Email: rizwan@illinois.edu
Phone:

(If Applicable)
Facilities Manager Name:
Email:
Phone:

## Project Information

*Provide a brief background of the project, its goals, and the desired outcomes.*

The objective of this project is to improve the conditions at 4 selected bus stops on campus. This will be accomplished by installing a small standing work desk in the interior of the bus stop that will have waterproof outlets provided adjacent to it for charging of laptops, tablets, or cellphones while patrons are waiting for the bus. Additionally, a wall mounted infrared heater or oscillating fan will be placed in the interior of the bus stop; allowing for the much needed heating or cooling of those individuals in the bus stop during the winter/summer months. In order to conserve the electricity needed for the heating and cooling units, these components will be turned on by students by the pressing of a button underneath the unit which will only turn the heater/fan on for 3 minutes. This will keep the units from running when no one needs them. The electric needs for this system will be met by an appropriately sized off-grid solar panel system which feeds generated electricity into a battery pack located underneath the standing desk.



***How will this project improve sustainability at UIUC?***

This project has the potential to improve sustainability at UIUC by providing a comprehensive solution to real issue that exists for students and faculty members. During times of incredible coldness or heat, those individuals who rely on the bus for transportation have to make a decision on whether or not they can bear the elements while waiting for the bus. This type of weather can often lead students especially to be more prone to staying home instead of going to class. This project will provide a solution to that issue by creating a more ambient environment in the bus stop, but through means that are entirely sustainable and improve the public image of the university in a very obvious and realistic way. Also, improvement of the bus system and the waiting process could allow for students who have somewhat written off public transportation to reconsider; a possibility of which the benefits would be an increase in carpooling culture on campus and decrease in emissions in the area.

***Where will the project be located? Do you need special permissions to enact the project at this site? If so, please explain and attach a letter of support to your application.***

The project will be installed at the 4 bus stops on campus grounds. These bus stops will be selected with the purpose of maximizing the following parameters:

- Number of individuals who use the bus stop
- Number of bus lines that frequent the bus stop
- Exposure to sunlight during the year

Stations that are currently being considered are those near the Pennsylvania Avenue Residence Housing, Illini Union, the University Bookstore, Grainger Engineering Library and the Undergraduate Library. These locations will be analyzed further to determine how well each bus stop meets these characteristics.

Due to the public nature of the project, it is necessary to get this project approved with the appropriate governing bodies in local legislature to get the project reviewed and approved. Our team has begun correspondence with the University's Transportation Coordinator, Lily Wilcock, to determine what steps would need to be taken to get this fully approved. Upon approval by the SSC, our team will meet with CU-MTD, the City of Urbana, and the City of Champaign to get the project approved for having met anti-vandalism specifications and reliability measures.

***Other than the project team, who will have a stake in the project? Please list other individuals, groups, or departments indirectly or directly affiliated to this project. This includes any funding entities (immediate, future, ongoing, etc.) and any entities that will be benefiting from this project.***

Other than the project team, the Facilities and Services department will be needed for collaboration in the process of installing the system; a process which should not take more than 2-3 hours per station. In addition to this, we will be enlisting the work of a computer science major who is comfortable developing the necessary code for the timing feature associated with the Heating and Cooling components of the projects.

***Please indicate how this project will involve or impact students. What role will students play in the project?***

This project has the potential to impact students and faculty members in a very prominent way by providing them with a service that greatly improves the attractiveness of the often-undesired action of "waiting for the

bus stop". By supplying a modest public workspace that features charging capabilities, students will be provided the opportunity to be productive during their time waiting for the bus despite possibly having a low charge on their battery on their laptop, tablet, or cell phone. Additionally, knowing that waiting for the bus doesn't have to be so miserable during times of extreme temperatures, students will be more inclined to be mobile around campus and perhaps less prone to missing a class due to weather. Improvement of the bus service can also potentially enable those students who currently forgo the bus system for their own vehicle to reconsider, indirectly promoting carpooling and sustainable transportation as a result.

*Have you applied for funding with SSC previously? If so, for what project?*

No.

## 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 in the table below. Please be as detailed as possible.*

The start date would be in the beginning of March, with the project installation requiring less than a week--possibly just one or two days. This would allow for enough time, ideally, to acquire materials after receiving funding and schedule workers to install the structures. The final report would be submitted in May after the project has been implemented for several weeks.

*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.*

<b>Materials</b>	<b>Price</b>	<b>Quantity</b>	<b>Total Price</b>
<b>Renogy 280W Monocrystalline Solar Panel</b>	<b>\$249.99</b>	<b>2</b>	<b>\$499.98</b>
<b>Blue Pacific Solar 2-G mounting Structure</b>	<b>\$340.59</b>	<b>1</b>	<b>\$340.59</b>
<b>Black Steel Support Beams</b>	<b>\$69.99</b>	<b>2</b>	<b>\$139.98</b>
<b>Renogy 12V 160Ah Battery</b>	<b>\$314.99</b>	<b>1</b>	<b>\$314.99</b>
<b>Renogy In-Line 15A Fuse</b>	<b>\$17.49</b>	<b>2</b>	<b>\$34.98</b>
<b>30A Charge Controller</b>	<b>\$19.99</b>	<b>1</b>	<b>\$19.99</b>
<b>ANL 30A Fuse</b>	<b>\$17.99</b>	<b>2</b>	<b>\$35.99</b>
<b>2000W Inverter</b>	<b>\$139.99</b>	<b>1</b>	<b>\$139.99</b>
<b>Battery/Electronics Weatherproof Enclosure</b>	<b>\$340.00</b>	<b>1</b>	<b>\$340.00</b>
<b>Renogy MMF/FFM Connector</b>	<b>\$12.99</b>	<b>1</b>	<b>\$12.99</b>
<b>5 Port Water Resistant Surge Protector</b>	<b>\$17.99</b>	<b>1</b>	<b>\$17.99</b>
<b>12 in Hurricane Oscillating Fan</b>	<b>\$33.95</b>	<b>1</b>	<b>\$33.95</b>
<b>760W Infrared Heating System</b>	<b>\$53.94</b>	<b>1</b>	<b>\$53.94</b>

<i>Self Timing Electronics</i>	<i>~\$100</i>	<i>1</i>	<i>\$100.00</i>
<i>Total Estimated Cost Per Unit</i>			<i>\$2085.36</i>
<i>Total Estimated Cost per Unit +10% Unanticipated Fees</i>			<i>\$2293.90</i>
<i>Total Cost for 4 Units</i>			<i>\$9175.58</i>

*If the project is implemented, will there be any ongoing funding required? What is the strategy for supporting the project in order to cover replacement, operation, or renewal costs? (Note: SSC provides funding on a case by case basis and should not be considered as an ongoing source of funding)*

There should not be a requirement for ongoing funding, as the systems should last for several years autonomously after installation. If after a significant amount of time repairs or replacements are required, an additional proposal can be made in that year, however many of the components in this project have a valid warranty between 3-20 years after purchase. Also, if the program proves to be successful, the associated transit departments may see it in their best interest to make sure the structures are maintained or expanded upon.

*Please include any other sources of funding that have been obtained or applied for, and please attach any relevant letters of support.*

No other funding has been applied for.

*What is the plan for publicizing the project on campus? In addition to SSC, where will information about this project get reported?*

The locations were chosen such to optimize publicity: anyone using one of those major campus bus stops will be able to see the structure and its uses. If approved, information about this project may appear on the University website for the Energy Systems program.