View results

Respondent

14 Erie Berri

25:13
Time to complete

Instructions:

Please adhere to the session word counts. Project leads must attend one SSC working group meeting post step 1 application submission. If you have any questions about the application process, please contact the SSC at Sustainability-Committee@illinois.edu.

1. Have you attended a working group meeting and presented your project to the committee before this application? The SSC requires attendance at a working group meeting to remain eligible for SSC funding. If you have not attended a working group meeting, please do so and then continue the application.

   Linked below is our calendar with all of our working group meetings
   https://studentengagement.illinois.edu/student-sustainability/ssc/calendar/

   *

   - (●) Yes
   - ( ) No

2. Please enter the dates of the working group meetings you attended. As a reminder, the working group meetings are structured as followed:

   - Energy + Transportation and Infrastructure working group.
   - Food & Waste + Land, Air, and Water working group.
   - Education and Justice working group.

   *

   October 26th, 2023 Transportation and Infrastructure working group

3. Project Name: *

   Illini Solar Car

4. Total Funding Requested From the SSC. *

   100,200

5. Date of application. *

11/17/2023

6. Project Lead Full Name: *

Nafi Osmani

7. Project Lead University Email Address. *

nosmani2@illinois.edu

8. Project Abstract: (In less than 100 words, briefly describe the project.) *

Illini Solar Car is a multidisciplinary student-led team that designs and builds road-legal solar-electric vehicles for the Bridgestone World Solar Challenge and American Solar Challenge. After traveling thousands of miles, powered by the sun, Brizo (our second generation vehicle) is no longer competitive for racing. 2023's goal is to perfect our new, third-generation vehicle to bring to the 2024 American Solar Challenge as well as begin the design process for our fourth generation vehicle. These races are on the forefront of sustainable innovation and the fierce competition demands teams to bring their best to each event.

9. Project Category *

- ○ Education & Justice
- ○ Energy
- ○ Food & Waste
- ○ Land, Air & Water
- ◉ Transportation & Infrastructure

10. Do you have a change in team members? *

- ○ Yes
- ◉ No

Project Questionnaire:

11. Any press releases or educational/promotional materials involving the project must acknowledge SSC funding. How will you bring awareness and publicize the project on campus? In addition to SSC, where will information about this project be reported? *

We design the livery of the car with all our sponsors and donors, including SSC and SSLC. The SSC logo will be present in any promotional material depicting our solar cars, including digital media we upload to our website (https://www.illinisolarcar.com/) as well as our social media accounts. We participate in local events within the Champaign-Urbana community as well as on campus where we bring our solar cars to discuss how sustainability initiatives benefit the environment and people as a whole.

12. 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 below *

Attached is a list of other entities we work with that have provided funding to our team

13. Please attach any letters of commitment or support here along with any other supplemental media that will support your application (presentations, pictures, etc.)

Copy of Calypso Sponsorships_Erie Berri.xlsx

14. How does this project impact environmental and social justice? 250 word max *

With the impacts of climate change looming, it is now more imperative than ever before to push the envelope of sustainable technologies and ideas. The main goal of Illini Solar Car is to build the world's best solar vehicle, driving forward our collective future through innovation, creativity, and competition. A staggering 28% of greenhouse emissions come from transportation in the US, as reported by the EPA in 2016. Even electric cars, which themselves don't emit any greenhouse gasses, are powered by electricity that is generated by gas, coal, etc. Solar powered vehicles free electric cars from the grid, allowing for a much cleaner form of transportation compared to contemporary electric vehicles. Reducing emissions via solar power will provide a path forward and a hope for a sustainable future.

15. Where is the project located, does it require Facilities and Services permissions? *

Warehouse Space, 1908 N. Linview Ave. Garages 6E & 7E
Our off-campus garage (dubbed Linview) is the primary workspace of Illini Solar Car. Linview is an off-campus workspace and is funded by the Illini Solar Car team. Currently, Linview is about 2,000 sq-ft over two garages. Students primarily get to this location by taking the 22N Illini bus. To work at the Linview facility, members must complete the required Engineering Student Projects Lab (ESPL) safety training tests and sign an additional waiver. Tasks performed at Linview include, mechanical assembly and testing, electrical assembly and testing, and other various tasks needed to build a solar vehicle.

ECE Department OpenLab
OpenLab is a workspace provided by the Department of Electrical and Computer Engineering located in rooms 2024 and 2026 of the Electrical and Computer Engineering Building. OpenLab is a shared space intended for RSOs and design projects that foster creative thinking and innovation. The majority of our electrical work is done here, including PCB design, soldering and assembly, testing, and system design. Additionally, many other meetings are held here including new car design meetings and business/media meetings. Access to the lab, as administered by the ECE Instructional Lab Coordinator Casey Smith and OpenLab committee, requires the completion of two Department of Research Safety (DRS) training modules, and an OpenLab safety tour.

Engineering Student Design Campus (ESDC) Solar Building
ESDC is a space provided by the Grainger College of Engineering for RSO projects. Within the ESDC, Illini Solar Car has a 1500 square foot space named "Solar Building" and utilizes the machining tools in the shared space. The Mechanical team primarily uses ESDC for mold construction. To access ESDC members must complete two DRS modules, pass the ESPL safety test, and complete further training for machine shop access.

16. Is this project student led? *

- (●) Yes
- ( ) No

17. If applicable, have you received approval from Facilities & Services and/or site manager? *

- ○ Yes
- ○ No
- ◉ N/A

18. Do you have a plan for ongoing funding beyond SSC? (SSC does not guarantee ongoing financial support) *

- ◉ Yes
- ○ No

19. Beyond SSC, do you have sources contributing funding or support (ex. staff time, external grants, etc.) to this project? *

- ◉ Yes
- ○ No

20. Have you applied for SSC funding previously? *

- ◉ Yes
- ○ No

21. Project Timeline:
(SSC funding agreements remain active for two years. List your project's proposed end date.) *

Fall 2023: The team begins ideation and starts the design of the 4th vehicle.

Spring 2024: Design of the 4th car continues along with creating the budgeting for the 4th vehicle. We will also be contacting other sponsors to begin getting funds for building the car. We will also be doing improvement to the 3rd car to potentially race in the 2024 American Solar Challenge.

Summer 2024: Complete the design of the 4th generation vehicle and continue to get more funding for the car. We will also be potentially competing in the 2024 American Solar Challenge while the rest of the team continues to do design and testing. During this time, we will also be creating the molds for the 4th generation vehicle so that it can be sent out for machining.

Fall 2024: Starting manufacturing the vehicle by machining the molds, and starting the manufacturing of the metal components. We will also be making larger purchases such as the batteries of the vehicle and wheel hubs.

Spring 2025: Continue manufacturing of the vehicle along with continuing building the vehicle.

Summer 2025: Finish manufacturing of the vehicle, reveal the name of the vehicle, and unveil the vehicle. Begin race preparations for the Bridgestone World Solar Challenge 2025.

Fall 2025: Test car in Australia, and race in the Bridgestone World Solar Challenge 2025.

22. Provide a detailed project description:
(In 400 words or less, describe your project. What does your project hope to accomplish? What are your project's deliverables?) *

Illini Solar Car is a multidisciplinary student-led team that designs and builds road-legal solar-electric vehicles for the Bridgestone World Solar Challenge and American Solar Challenge. In our team's history, we have successfully developed and raced two solar electric vehicles, Argo and Brizo numerous times in these national and international competitions.

After Brizo's success last year, we have strived towards our next goal to design, manufacture, and refine our new, third-generation solar vehicle, 'Calypso' to compete in the 2024 American Solar Challenge. These races are on the forefront of sustainable innovation and the fierce competition demands teams to bring their best to each event.

The designing and manufacturing of the car is an experience for students to learn and hone their engineering and manufacturing skills on a tangible product. The interdisciplinary learning across our different subgroups such as business, marketing & media, and electrical & mechanical engineering gives students a hands-on taste of how these workforces operate in respective fields in the real world. The result came to be a much more efficient solar vehicle that will be a look into what the future of sustainable technology can be.

Calypso will continue to be used in outreach, raising awareness, and inspiring sustainable innovation for many years. However, as we build our new car in the future, 'Project D', we will continue to promote innovative engineering & entrepreneurial education, push the boundaries of renewable energy, and teach others in the community what renewable technologies are capable of.

23. Environmental Impact:
(In 200 words or less, how does your project increase environmental stewardship at UIUC? If applicable, what is the carbon, water, waste, and/or energy savings?) *

As a racing team, the goal of the Illini Solar Car team is to construct the most efficient solar power vehicle through cutting edge motor technology. Between our first (Argo), second (Brizo) and third (Calypso) cars, Illini Solar Car has managed to create a lighter vehicle (224 kg to 192 kg) with more efficient solar cells (22.7% to 25.1%). These advancements decrease the rate of energy consumption and increase the charging rate of the battery in the car, making it more efficient in operation as a whole. Of course, an efficient solar powered car is necessary to compete nationally and internationally on behalf of the University.

However, renewable fuel options is not the only thing Illini Solar Car promotes! We also promote sustainable transportation efforts and reduced emissions from travel, not unlike many of the transportation projects in iCAP. Furthermore, we strive for carbon neutrality by not relying on gasoline combustion. These cars have participated in events such as Engineering Open House, unveilings, and parades; these events allow us to perpetuate the idea of environmental stewardship at UIUC. We also are preparing many students on practical engineering solutions and practices. We prepare our members to enter the workforce once they graduate.

24. iCAP Objective Correspondence:
(In 200 words or less, does your project aim to advance one or more of the Illinois Climate Action Plan's (iCAP) objectives? If so, how?)

A full list can be found here: https://icap.sustainability.illinois.edu/objectives

The Illini Solar Car team debuted our second-generation solar-powered vehicle, Brizo, in March 2021. We are currently in the process of building and testing our third-generation car set to start racing in 2024. The team is currently seeking funding for crucial components to create an all-new and even more efficient solar electric vehicle. As a sustainability-oriented team, our team cares about making our vehicle the most efficient it can be. Our vehicle's components will result in a more energy-efficient car while also encouraging sustainable thinking and innovation. The Illini Solar Car project aligns with several iCAP objectives as outlined below.

iCAP Objectives:
2.3 Clean Energy Sources
The publicity of our team's cross country races paired with the emphasis on solar power promotes the idea of a realistic future of clean energy. Illini Solar Car encourages the use of solar power in everyday life.
3.3 Electric Vehicle Task Force
A fundamental aspect of Illini Solar Car is building an electric vehicle. Our team focuses on championing a future of electric, extraordinarily efficient, vehicles.
6.1 Broaden Sustainability Education
One of the goals of Illini Solar Car is to emphasize innovations in sustainability and forward-thinking. The team helps to educate students from across the university to design and build sustainable solar vehicles.
6.2 Sustainability Course Catalog
Aside from providing a hands-on educational experience for our members, Illini Solar Car also administers the course ECE 298 AB. This course explores the methods of building and driving a solar vehicle and includes sustainability-focused topics such as solar panels, power system optimization, aerodynamic efficiency, and battery usage. Our course was recently assigned a TA as we work to move our course from the special topics section and into the permanently offered ECE curriculum.

iCAP Themes
Illini Solar Car embodies many of the central iCAP themes. One of the core missions of our team is educating our members - we leverage the combined knowledge from academic curricula to research, design, and construct extremely efficient electric vehicles, using technologies that prepare our members for their careers. Our team encourages sustainability through community outreach and education with prospective students and the general public. We constantly research new technologies towards our ultimate goal of promoting sustainability and innovation. Illini Solar Car is trying to research the viability of solar energy as an alternative fuel source for transportation, promoting solar technology on all fronts. We are proving that solar power solutions are viable for a sustainable future.

25. Student Impact:
(In 200 words or less, how will this project benefit students? How will students be involved with this project? What educational components are in your project?)
*

Illini Solar Car hosts a vibrant and multidisciplinary group of 300 hailing from Grainger, Gies, ACES, AHS, and LAS. Our team's mission revolves around the hand-on construction of road-legal solar-powered cars that compete in international competitions. During this process, members of Illini Solar Car bring a diverse spectrum of skills and backgrounds, ranging from engineering to design to business operations, all united by a shared passion for innovation.

Our team's commitment to Illini Solar Car extends beyond our weekly meetings and daily construction sessions. Whether it's designing printed circuit boards, researching telemetry and race tactics and forging valuable partnerships with corporate sponsors to advance the progress of our car to be the best in the world, it is our firm belief that the work put into this RSO directly correlates with the rewards reaped. Through technical operations and hands-on experience members become experts with these projects and more:

- Design, analysis, and manufacturing of lightweight composite materials
- Design, construction, and management of Lithium-Ion battery systems
- Hands-on fabrication and integration of solar arrays
- Applications of machine learning and data analysis to maximize vehicle efficiency
- Interaction with industry-leading sponsors in energy, transportation, and sustainable technology

Project Finances

26. See attached file, please be very descriptive and fill out the finalized budget and timeline Excel sheet, and submit it below.

    https://studentengagement.illinois.edu/student-sustainability/ssc/docs/SSC-Supplemental-Budget-Timeline.xlsx *

    SSC-Step2-Supplemental-Budget-and-Timeline_Erie Berri.xlsx

27. Project Finance Manager.
    Must be a fulltime UIUC faculty or staff member** *

    Arijit Banerjee

28. Finance Project Manager Department *

    Electrical and Computer Engineering

29. Project Finance Manager University Email *

    arijit@illinois.edu