



## 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](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:** Illini Solar Car Second Gen. Vehicle

**Total Amount Requested from SSC:** \$40,000

**Project Topic Areas:**  Land & Water  Education  Energy  
 Transportation  Food & Waste

**Applicant Name:** Nick Zou

**Campus Affiliation (Unit/Department or RSO/Organization):** Illini Solar Car

**Email Address:** [nickzou2@illinois.edu](mailto:nickzou2@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.): *Illini Solar Car*

### Project Team Members

Name	Department	Email
Nick Zou	Supply Chain / Illini Solar Car	<a href="mailto:nickzou2@illinois.edu">nickzou2@illinois.edu</a>
Geoffrey Ong	Finance / Illini Solar Car	<a href="mailto:go5@illinois.edu">go5@illinois.edu</a>
James Wyeth	ECE / Illini Solar Car	<a href="mailto:jamesw2@illinois.edu">jamesw2@illinois.edu</a>
Jonathan Mullen	ECE / Illini Solar Car	<a href="mailto:jtmulle2@illinois.edu">jtmulle2@illinois.edu</a>

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

Name of Faculty or Staff Project Advisor: Arijit Banerjee

Advisor's Email Address: [arijit@illinois.edu](mailto:arijit@illinois.edu)

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

Contact Name: Beverly A. Curtis

Unit/Department: ECE Business Manager

Email Address: [bcurtis@illinois.edu](mailto:bcurtis@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:**

*You may copy and paste your Step 1 application answer if nothing has changed.*

Illini Solar Car is a multidisciplinary student-led team that designs and builds road-legal solar-electric vehicles for the World Solar Challenge and American Solar Challenge. Since the founding of the team in 2014 we have researched, designed, and built our first solar electric vehicle, Argo, with some previous support from SSC in 2015. This vehicle took part in the 2017 World Solar Challenge in Australia and placed 7th at the 2018 American Solar Challenge.

After traveling thousands of miles, powered by the sun, Argo is no longer suitable for racing in cross-country races such as the World Solar Challenge and American Solar Challenge. These races are at the forefront of sustainable innovation and the fierce competition demands teams to bring their best to each event. Our team is currently far into the design phase for our much improved second-generation vehicle. Argo has served as an invaluable learning experience for hundreds of students. The interdisciplinary learning across our different groups such as business and engineering gives students a taste of how workforces operate in the real world.

Our goal is to bring this brand new solar vehicle to the 2019 World Solar Challenge to compete with the best of the best. Over the next year, our team will finish the design and build this new vehicle using cutting-edge materials and manufacturing methods. The result will be a much more efficient vehicle that will be a look into what the future of sustainable technology can be.

Over 100 University of Illinois students will get hands-on experience applying what they learned in class to sustainable technology as well as learn new skills that they would not have learned in class. Argo will continue to be used in outreach, raising awareness, and inspiring sustainable innovation for many years. As we build our new car, we will continue to push the boundaries of what is possible with renewable energy and teach others about it.

### **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.*

#### Warehouse Space at N. Linview Ave.

Linview is the off-campus workspace that serves as the primary storage and workspace for Illini Solar Car. ISC currently rents approx. 3000 sq. ft. over 3 garages. It is in this facility that all In order to access Linview members must pass the same safety test required for the Engineering Students Project Laboratory and sign an additional waiver. These requirements are to ensure the safety of all team members while working on the project and are achievable by all students. Tours are given on occasion. [Need relevant letter of support]

#### Engineering Student Project Laboratory (ESPL)

ESPL is a space provided by the College of Engineering for RSO projects. ISC has a small space in the central room and utilizes the machining tools. The Mechanical groups primarily uses ESPL for dynamics and roll-cage construction. To access ESPL members must complete two DRS modules, pass the ESPL safety test, and complete further training for machine shop access.

### ECE Department OpenLab

OpenLab is a workspace provided by the Department of Electrical and Computer Engineering located in rooms 2024 and 2026 of the ECEB. The purpose of OpenLab is a space for personal projects and RSO's that require the use of lab spaces and tools. Most electrical system assembly and debugging are done in this space primarily by the electrical and solar groups. Additionally, meetings are held in the clean meeting area. Access to the lab, as determined by the ECE Instructional Lab Coordinator Casey Smith, requires the completion of two Departments of Research Safety (DRS) training modules and an OpenLab safety tour.

**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.*

#### Orange and Blue Level

- I. Department of Electrical and Computer Engineering (letter of intent pending)

#### Silver Level

- II. Sim Scale (See Attachment)
- III. Bay Area Circuits (See Attachment)
- IV. SORF (see attachment)
- V. 3M (letter of intent pending)
- VI. Molex (letter of intent pending)

#### Bronze Level

- VII. Phoenix Contact (letter of intent pending)
- VIII. College of Engineering (see attachment)

#### Friend Level

- IX. Texas Instruments (letter of intent pending)

*\*We have just recently started signing letters of intent with sponsors, pending ones can be submitted to SSC as available should you wish*

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

*This includes both direct and indirect impact.*

Our team currently consists of over 120 members. Contributing to the team provides them with hands-on work related to their interests and/or major. Illini Solar Car enables its members to apply what they've learned in the classroom or on their own to the real world application of building a solar car. Students on our team have access to industry standard software and tools, and they gain experience in the design and manufacturing of current standard materials as well as new technologies. Not only are they able to expand their knowledge in their field of study, but they also have the opportunity to work outside of their major. Through hands-on, interdisciplinary work that fosters real-world applications, we also spark sustainable thinking by designing and building a road-legal car to compete in international competitions.

Furthermore, Illini Solar Car also conducts outreach events with the general public. A main part of that includes visiting schools to motivate students to engage in STEM and think consciously about where their energy comes from. As a part of the American Solar Challenge we also had the opportunity to meet people across the country during the race to showcase the sustainable innovation happening at the University of Illinois. After meeting with us several middle/high school students are now thinking of coming to Illinois to work on projects like solar car. Some other outreach events we participate in are Engineering Open House

and Pygmalion Tech Demo. During events like these, many curious community members reach out to us about the vehicle, which provides them with an opportunity to learn about environmental sustainability and Illini Solar Car's role on campus. With our new car on the way, we hope to find more outreach events to speak to more students and community members.

This new solar vehicle will not only serve as a learning opportunity for our current team members, it will be an example to learn from for hundreds more students for years to come. Once its racing life is over later in the early 2020's it will remain active as an outreach and teaching vehicle as Argo will now. With more cars around the team will have a much easier time balancing vehicle availabilities to enable more outreach and learning.

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

Illini Solar Car has quickly become one of the most recognizable organizations on campus at the University of Illinois. Argo, Illini Solar's first vehicle, has made frequent appearances at campus events such as Pygmalion, Quad Day, Engineering Open House, and E-Night. On these occasions, students experience an appealing and hands-on look at sustainability on campus. They take away new inspiration about the possibilities of green technology and alternative energy. We look forward to demonstrating the ongoing success of our new car at campus events in the upcoming year.

The business group is responsible for media and outreach for ISC, including maintaining our social media accounts and sending out a monthly newsletter. Sponsors and information about Illini Solar Car are also available on the team website [www.illinisolarcar.com](http://www.illinisolarcar.com). ISC will be posting updates on the new car on our website and through our various social media accounts:

- Instagram: @illinisolarcarteam
- Facebook: @illinisolarcar
- Twitter: @IlliniSolarCar
- Reddit: u/IlliniSolarCar

Through these events and postings, the campus community will gain more awareness about the benefits of renewable energy. The publicity of ISC will continue to push our campus toward a path of sustainable development, and its innovation exemplifies the opportunity renewable technology presents.

**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?**

In 2015, SSC supported us in building our first vehicle, Argo, which proved to be highly successful. Argo has driven over 3000 miles, raced in the 2017 Bridgestone World Solar Challenge, and placed 7th in the 2018 American Solar Challenge. This vehicle was the result of almost three years of hard work, not only in the design and building of the car, but also in finding a footing and carving out a space for a solar car at the University of Illinois. Many of the new teams registered for competition in 2017 failed to arrive with a working vehicle. In addition, a former Stanford solar car team member and current solar car blogger who attended our competition remarked that, despite being a first time team, we arrived with "a well-engineered car."

After years of hard work and learning from our experiences, we're now ready to start the cycle again and build an improved solar car, as race regulations are evolving. Argo has provided and will continue to provide a great learning opportunity for our team members. Through these competitions, we have been able to validate many of our designs and manufacturing methods (especially regarding composite materials) and

have also found many areas for improvements (especially in telematics and data usage during a race). We are extremely grateful for the past support and believe that our new vehicle will greatly benefit from additional funding from SSC.

The purpose of Argo is shifting with the 2nd vehicle on the way. Without the need to have the vehicle ready for long-distance races that require incredible reliability, team members can feel more free to try new things and take apart the car to learn from it. Additionally, with road tests not on the schedule often, Argo can be much more available for outreach events.

**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?**

*Please note that SSC provides funding on a case by case basis annually and should not be considered as an ongoing source of funding.*

The construction of a solar car is an intensive project, but after its completion the outreach and operation of the car will not require ongoing funding. The business group of Illini Solar Car is responsible for the procurement of parts and funding, which make the construction of the new car possible. We have a detailed financial system that allows us to be conscious of all our expenditures and contributions. In addition to monetary contributions, ISC also accepts in-kind donations of equipment and materials used on the project. We strive to have all our funding in order as early as possible, and have estimates for all the cost of manufacturing and competition.

With one car completed and several races attended these estimates are more accurate to allow us to plan much better. Costs associated with maintaining the vehicle long-term and attending outreach events with the vehicle are covered within our basic operating budget from regular sources. This will ensure the vehicle can continue to be used for years to come for the benefit of many team members and countless community members.

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

Illini Solar Car accepts sponsorships from companies, both monetary and in-kind. We have confirmed support from nine organizations thus far, are far into talks with several other returning sponsors, and in early talks with many other new sponsors. The list of confirmed sponsors and levels is included in the list of stakeholders above. A few of the other organizations we have reached out to for sponsorship include major sponsor from our last vehicle, Ameren, Gurit, Chevron Phillips Chemical, and John Deere, as well as some new potential sponsors, such as PepsiCo, BP and Citadel.

## **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?**

Driving our solar vehicle around campus has no effect on the environment because it has no emissions whatsoever! As our campus begins to go carbon neutral, it's important to consider the possibilities of solar power as a substitute for our current energy sources. Based on the 2015 deadline for the objectives in the 2010 iCap, the campus met six out of the eight objectives. Reducing greenhouse gas emissions from transportation by 30% is one of the objectives not met. Solar power has a wide variety of possibilities that surpass most people's assumption of just some solar panels on a building. The increased use of carbon neutral technologies in transportation will help Illinois meet its iCap goals for the next five years. One way our team can contribute to the 2015 iCAP path to carbon neutrality is based on the objective of curricular education. Students are able to develop skills relevant to their chosen field while being able to work on a project that promotes environmental sustainability.

**How will you monitor and evaluate the project's progress and environmental outcomes? What short-term and long-term environmental impacts do you expect?**

*Some examples include carbon emissions, water conservation, green behavior, and reduced landfill waste.*

Our project is part of a larger movement to bring more solar powered machines to reality in the future. We can monitor the progress of ISC on the community through the growth of our social media accounts. With the growth of these accounts, and through our successes in competition, community members can see the immediate and diverse applications of sustainable technology. Our success inspires the university to look for other ways to use solar energy and environmentally friendly technology in their daily life. Together with the solar powered vehicle community we are bringing awareness to the immense possibilities that solar power has. Short-term this may look like more and more solar car teams competing in international competitions. Long-term this looks like thousands of miles driven completely by solar power, encouraging people on multiple continents to consider the vast possibilities of solar power.

A large measuring stick for this vehicle will be the last vehicle and its results. This vehicle is should be significantly more efficient than Argo. The improvements we make and the results that it produces will display just how much our team has learned from the past vehicle and the sustainable innovation made possible by Illini Solar Car.

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

Our first vehicle has participated in many outreach events at University of Illinois, including Engineering Open House, Quad Day and Pygmalion Festival, and has traveled to outreach events such as the Chicago Drive Electric event last spring. Argo will continue to attend outreach events for years to inspire people towards environmental stewardship by demonstrating the immense possibilities of sustainable technology. Attendees at our events are often surprised at the functionality and power of the solar car. People walk away with a new conception about the future of solar and electric vehicles.

This year, one of our main goals is to bring Argo to more outreach events, especially in the Champaign-Urbana area. Our hope is that our community will be proud of the strides that University of Illinois students are making towards environmentally friendly energy and continue to support projects like ours. Creating a green environment at the University of Illinois requires a large commitment from the student body and the first step in making that commitment is creating an understanding of the opportunity sustainable technology presents; ISC is helping to make that first step in our commitment a reality.

The new vehicles primary purpose, at the start, will be for the learning of Illinois students. It will make occasional appearances at the larger events early in its life (such as at car shows). Once it has completed the World Solar Challenge it will appear at more events as Argo is now.

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

This project's goal is to explore the vast possibilities of solar powered, emission free vehicles in the future. 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. So they are not entirely clean as a fully solar powered car would be. By transitioning to solar powered transportation, we would be combating environmental injustice by protecting our air, as well as the resources that go into generating electricity.