*Please submit this completed application, the supplemental budget spreadsheet, and any relevant supporting documentation by the deadline indicated in your Step 1 notification letter 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 SSC Program Advisor, Micah Kenfield, at* *kenfield@illinois.edu*

# General Information

**Project Name:** Project Name

**Total Amount Requested from SSC:** Total Project Cost

**Project Topic Area(s):** [ ] Energy [ ] Education [ ] Food & Waste

 [ ] Land [ ] Water [x] Transportation

# Contact Information

### Project Lead

Applicant Name: Widianto P. Moestopo

Unit/Department: Illini EcoConcept

Email Address: moestop2@illinois.edu

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### Financial Contact *(Must be Full-time University of Illinois Staff Member)*

Contact Name: John Wierschem

Unit/Department: Department of Mechanical Science and Engineering

Email Address: mechse-business@illinois.edu

Phone Number: 217-333-6741

Organization Code: 632610-917014-191100

### Facilities Management Contact *(If Applicable)*

Contact Name: Bruce Flachsbart

Email Address: mems@illinois.edu

**Primary Project Team**

|  |  |  |
| --- | --- | --- |
| **Name** | **Department** | **Email** |
| Michael Philpott | Department of Mechanical Science and Engineering | mphilpot@illinois.edu |
| Jason Pard Liew | Illini EcoConcept | jliew2@illinois.edu |
| Dylan McGregor | Illini EcoConcept | dmcgreg2@illinois.edu |
| Kenneth Hoffmann | Illini EcoConcept | khffmnn2@illinois.edu |

# Project Description

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

The Illini EcoConcept team will design and manufacture a Hydrogen Fuel Cell Urban-Concept Vehicle to compete in the Shell EcoMarathon Competition in 2017. While the competition has always been centered around energy efficiency, it also promotes and rewards innovation that leads to a more sustainable energy system to support communities around the globe. Specifically, in the Urban-Concept Vehicle division, teams compete to have the most efficient vehicle that incorporates many features of real-world cars, such as wet-weather driving ability, headlights, turn indicators, etc.

The Illini EcoConcept has chosen to power their vehicle using hydrogen fuel cell, which has been gaining popularity lately, and is seeking to break the competition efficiency record in the coming school year. The team would like to build on the 2nd place finish in the Americas region last year and be able to compete in the world championship. Specifically, the team strives to (i) promote the use of hydrogen fuel cell as a clean alternative to combustion engines, (ii) build a whole new drivetrain system that would eliminate the causes of inefficiencies found in the previous years, (iii) design and fabricate a lighter chassis and body, and (iv) develop an air-cooling system that would prevent overheating of the system.

**How will the project improve the sustainability of the Illinois campus and how will the project go above and beyond campus standards?**

While the vehicle project is aimed to improve the feasibility of clean transportation for the general public, the Illini EcoConcept is doing so with the local environment in mind. Not only has the team taken measures to reuse various components from previous years, it is now seeking to incorporate recyclable materials from the Champaign recycling plant. Specifically, the team is experimenting with paper waste as a body material for future vehicles.

**Where will the project be located? Will special permissions be required to enact the project on this site? If so, please explain and submit any relevant letters of support with the application.**

The team has permission to use the shop located in MEB 118 to work on their vehicle, through approval of the department and advisors.

**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 will be benefitting from this project. Please attach letters of commitment or support at the end of the application.**

Our sponsors are the only other ones affiliated with the project. The list is included in the “Financial Information” section.

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

The Illini EcoConcept is led by and comprised of UIUC students, under the guidance of professors in the Department of Mechanical Science and Engineering and Design Council. The team promotes interdepartmental collaboration among students, as evidenced by the many engineering disciplines represented in the team. The team’s project will be divided into four different subsystems (Body & Chassis, Suspension & Steering, Electronics, Powertrain) led by experienced members who are going to be mentoring younger students in the team. The mentoring initiative is critical to develop the next generation of vehicle engineers and sustain the team for future years.

The group also provides students the opportunity to participate in many outreach events, promoting sustainable technology especially as it relates to the future of transportation. As a group, we understand the larger picture of our work and how it fits into the future of sustainable transportation. This is a message we share with the community through outreach events.

In addition to hands-on skills, the students benefit greatly from working in a collaborative environment on a technical project. Many students also have the opportunity to travel to the annual competition in Detroit with some students also being selected to travel to the international competition in London. Interacting with the European and Asian teams has been highly beneficial for many reasons, including understanding cultural differences between different parts of the world, differences in educational system, and overcoming language barriers. The competition brings together teams from all over the globe to help us recognize that these are truly global challenges we face that must be accomplished through collaborative efforts.

# 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?**

No.

**If this 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?** Since the Illini EcoConcept aims to compete in the Shell Eco-Marathon competition(s) every year, more funding will be required for future projects. So far, the team has continually applied for and received funding from the Engineering Design Council and the Department of Mechanical Science and Engineering. In the past two years, efforts to seek sponsorship have been increased, and the team has received one-time funding from companies such as Intren and John Deere to make the operation of the team sustainable. Each year we look to renew current partnerships for the next academic year, as well as to seek for new partnerships.

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

If needed, please also address this in the supplemental budget spreadsheet in the relevant section.

**Please include any other sources of funding that have been obtained or applied for. Please attach any relevant letters of support as needed in a separate document.**

Engineering Design Council ($5,000);

Intren ($4,000);

John Deere ($3,250);

MechSE Student Society ($2,250);

ECE Dept. ($1,500);

TW Metals (~$1,250);

SORF ($873.92);

Maxon (~$1,500);

Wilwood (~$100);

Misumi (~$50)

# Environmental, Economic, and Awareness Impacts

*In addition to the below questions, please indicate specific measurable impacts as applicable on the supplemental budget spreadsheet.*

**Which aspects of sustainability does your project address, and how? Does the project fit within any of the iCAP goals? If so, how does the project go beyond the university status quo standards and policies.**

The Illini EcoConcept’s vehicle project aims to improve the feasibility of hydrogen fuel cell technology in personal vehicles. Each year, the team studies the inefficiencies that are still present in today’s hydrogen fuel cell vehicles and works on projects that addresses these specific problems. The project mainly fits the Education & Outreach goal in 2015 iCAP by providing a unique opportunity for students to study & contribute in transportation sustainability and educating the public of the need for sustainability in transportation through involvement in various open houses and green energy symposiums.

Moreover, the team is currently working to use locally-sourced recyclable materials as alternative body materials. If successful, this will be the first car in the competition that utilizes such materials. Altogether, the team introduces students to the necessity of mobility and transportation technology which is environmentally conscious.

**How will the environmental impacts of your project be measured in the near and long term? What specific monitoring and evaluation processes will you be using to track outcomes and progress?**

Since the team develops a lot of prototypes, there are always concerns regarding how to dispose or utilize components from the previous years. The first step in measuring environmental impacts of our project will be to list all components that we have in the beginning of each school year. Using this list, we will donate or responsibly dispose/recycle unusable components and document the actions we take for these components. Moreover, we will document any eco-friendly measures that we take in choosing the materials and systems for our present vehicle. At the end of the year, we will compile all of our environmental impacts data and include them in our final report.

In addition, we have a number of students who have actively sought out internships or full time positions as a result of their time in the group. The more students we have pursuing such a career, the great long term effect we are able to have in pushing forward towards a green future.

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

The project has been and will be publicized during Quad Day, MechSE Open House, Engineering Open House, McHenry County Green Living Expo, as well actively on social media.

**What are your specific, measurable outreach goals? How will these be measured?**

Our outreach goals are to attend at least 5 outreach events a year, with at least 2 occurring outside the local community.

Additionally, we aim to grow our facebook page like count at least 100 users per year, posting updates at least once a week. Currently, we are at 172 likes, with a goal of 250 by the end of the year. Beyond a number, this is an effective platform to share information about our group as well as sustainability.

**Do you have any additional comments or relevant information to aid in evaluation of this application?**

Please provide any additional information here.