View results

Respondent 10 Abby Gillham

80:58 Time to complete

Instructions

Please adhere to the session word counts. Project leads must present their project at a SSC Working Group meeting prior to the submitting their application. The Working Group meeting schedule can be found on the SSC website.

NOTE: This document will be shared publicly on our SSC Illinois Climate Action Plan (iCAP) portal so that others can learn from your project.

If you have any questions about Working Groups and/or the SSC application process, please contact the SSC at <u>Sustainability-Committee@illinois.edu</u>.

Has someone from the project's team presented their Step 2 project at an SSC Working Group meeting? *

YES

1

○ NO

2

Select the Working Group meeting you attended. *

C Energy + Transportation & Infrastructure Working Group Meeting

Food & Waste + Land, Air, & Water Working Group Meeting

O Education & Justice Working Group Meeting

3

Date of the Working Group meeting you attended.*

10/16/2024

4

Project's Name *

Illini EV Concept EV3

5

Amount of funding requested from the SSC for this project *

59.935.97

....

Project Category *	
C Education & Justice	
C Energy	
O Food & Waste	
🔿 Land, Air & Water	
Transportation & Infrastructure	
7 Project Abstract * In less than 100 words, briefly describe the project.	
At Illini EV Concept, we are developing EV3, our latest electric vehicle, emphasizing autonomous integration and enhanced aerodynamic design. Unlike our current model, EV3 will incorporate advanced technologies such as Lidar as sensors for autonomy, while also featuring a regenerative braking system to recover energy during braking. We aim to build our own battery system, enriching our team's knowledge in energy storage and design. This project not c innovation and sustainability but also provides valuable, hands-on experience for our members in hardware creation and automotive engineering.	nd relevant only promotes
⁸ What key changes are reflected in your Step 2 application compared to your Step 1 application, if any, and why? *	
Our Step 2 application goes into greater detail of what our budget would be allocated towards, and splits our overall budget into several spreadsheets to show what our highest priorities are for funding right now.	

Project Lead

9

Project Lead's Full Name *

Nicholas Yeung

10

Project Lead's Department/Campus Affiliation *

School of Information Science

11

Project Lead's University Email Address *

yinokny2@illinois.edu

12

All student-led projects require a faculty/staff advisor. Is this proposed project a student-led project? * NOTE: Only currently enrolled Illinois students are eligible to be a Project Lead.

YES (by selecting YES, you affirm that the Project Lead is a currently enrolled Illinois student)

🔿 NO

Faculty/Staff Advisor

A Faculty/Staff Advisor is required for all student-led projects.

13
Faculty/Staff Advisor's Full Name *
Samidh Singh
14
Faculty/Staff Advisor's Department *
Mechanical Science and Engineering
Faculty/Staff Advisor's University Email Address *
ssingh76@illinois.edu
Desire the Theory del Courte et
Project's Financial Contact
The project's Financial Contact must be a full-time Illinois employee who has the authority to manage the project's financials and generate financial reports on behalf of
the project.
16
Financial Contact's Full Name *
Financial Contact's Full Name *

Financial Contact's Department *

Mechanical Science and Engineering

18

Financial Contact's University Email Address *

sfpower2@illinois.edu

19

Are there additional members of your project team? *

YES

○ NO

Additional Team Member

20

Team Member's Full Name:

Abigail Gillham

21
Team Member's Department/Campus Affiliation:
Siebel School of Computer and Data Science
22 Team Member's University Email Address:
gillham3@illinois.edu
23
Do you have additional team members? *
YES
○ NO
Additional Team Member
24
Team Member's Full Name *
Kathryn Lee
25
School of Molecular and Cellular Biology
26
Team Member's University Email Address *
khlee6@illinois.edu
27 Do you have additional team members? *
YES
○ NO
Additional Team Member
28
Team Member's Full Name: *
Estela Medrano

Team Member's Department/Campus Affiliation: *

Electrical and Computer Engineering

30

Team Member's University Email Address: *

estelam2@illinois.edu

Project Questionnaire

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List your proposed project's timeline and major milestones. *

NOTE: SSC funding agreements remain active for two years. Thus, your timeline should reflect your activities over a two year period or less.

Year One: Quarter 1 (August 22 - October 18, 2024): Completion of initial design for mechanical systems. Conduct onboarding workshops focused on soldering and PCB design Quarter 2 (October 19 - December 18, 2024): Complete the battery system blueprint Start testing the FPGA camera project and begin initial testing of regenerative braking. Quarter 3 (January 18 - March 20, 2025): Complete major electrical projects (e.g., telemetry board, dashboard upgrades, and car lights). Completion of initial design for autonomous integration plans Quarter 4 (March 21 - May 13, 2025): Perform full vehicle system testing and prepare for participation in the Shell Eco-Marathon Finalize design of EV3 for construction next yea Year Two: Quarter 1 (August 22 - October 18, 2025): Complete the secondary battery system and active battery management system. Enhance the self-driving integration to ensure advanced autonomous functionality. Begin construction of EV3 frame. Begin creating the body panels of EV3 Quarter 2 (October 19 - December 18, 2025): Finalize and integrate the regenerative braking system and conduct final vehicle testing Optimize the steering wheel and suspension systems for competition readiness. Completion of EV3 frame Quarter 3 (January 18 - March 20, 2026): Complete final engineering on car body to prepare for next race Conduct mock trials to prepare for competitions. Begin body panel and frame integration Ouarter 4 (March 21 - May 13, 2026); Participate in the Shell Eco-Marathon and analyze performance data for future improve Host final workshops to share knowledge and experiences with new team members. Complete EV3

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Describe your project in detail.*

Be sure to address the following:

-What are your project's goals and how do you intend to accomplish them? -What are your project's deliverables?

Our current project is centered on building a new version of our electric vehicle that incorporates advanced autonomous integration, as the existing model lacks self-driving capabilities. This new design will feature a more aerodynamic body to enhance overall efficiency and performance. Additionally, we aim to implement a regenerative braking system that recovers energy during braking, optimizing energy usage. To enable autonomous functionality, we will install Lidar and other relevant sensors, necessitating the integration of external hardware. This initiative will involve close collaboration among our multidisciplinary teams—Mechposites, Electrical, Autonomous, and Embedded—to ensure all systems work seamlessly together. Our goal is to create a vehicle that not only improves performance but also prepares us for participation in competitions like the Exo Marathon and the Shell self-driving competition, demonstrating our commitment to sustainability and innovation in electric vehicle design. We hope to apply for the innovation award in this competition for thoughtfully developed vehicle design and specialized features.

Authentic sustainability consists of the overlapping area of 3 spheres: Environment, Society, and Economy.

Describe how your project addresses sustainability.*



Our project addresses sustainability by focusing on three important areas: environmental, social, and economic sustainability. Environmental sustainability is at the heart of what we do. We are developing an electric vehicle that's not just high-tech but also personalized and optimized to minimize its impact on the environment. By prioritizing aerodynamics and energy efficiency, we aim to reduce energy consumption and emissions compared to traditional vehicles. Plus, we're implementing a regenerative braking system that captures energy usually wasted during braking, helping us use resources more wisely. On the social sustainability front, we believe in building a strong community that supports sustainable practices. We actively promote a positive message about caring for the planet and encourage our team members to take meaningful actions

On the social sustainability front, we believe in building a strong community that supports sustainable practices. We actively promote a positive message about caring for the planet and encourage our team members to take meaningful actions toward environmental stewardship. By creating an inclusive environment where everyone can share their passions and learn from one another, we foster a sense of belonging and empower individuals to become advocates for sustainability in their everyday lives.

Lastly, we focus on economic sustainability by equipping our team members with the technical skills they need for future success. Our hands-on experience with cutting-edge technologies related to electric vehicles and autonomous systems prepares our members for valuable job opportunities down the line. This not only benefits them individually but also contributes to a skilled workforce ready to tackle the challenges of tomorrow. Through our commitment to these three areas of sustainability, we aim to make a real difference, advancing technology while promoting a culture of responsibility and opportunity for everyone involved.

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How does your project promote and increase environmental stewardship at UIUC? *

If applicable, also address what the carbon, water, waste, and/or energy savings is associated with your project.

While we're primarily focused on reducing carbon emissions and energy use, we also have positive impacts on water conservation and waste management. One of the advantages of electric vehicles (EVs) is that they generally require less maintenance compared to gas-powered cars. This means we'll have fewer oil changes and less hazardous waste to deal with, like used oil and filters. For every 1,000 gas cars, the number of oil changes each year can lead to several gallons of waste oil, which can harm the environment. By focusing on EVs, we're cutting down on this waste significantly.

The processes of extracting and refining oil are very water-intensive. Oil extraction can use massive amounts of water, which can drain local resources and even lead to contamination. By opting for EVs, we're helping to save water and protect our ecosystems from these harmful practices. The process of refining oil can create a lot of industrial waste, which can pollute our air and water. By decreasing our reliance on fossil fuels, we're helping to reduce this waste as well. This is crucial in the fight against climate change and for promoting sustainability.

Our project is about more than just cutting carbon emissions and saving energy. We're also making strides in better water management and reducing waste. By advocating for electric vehicles, we're fostering a more sustainable future on campus and helping to create a culture of environmental stewardship that benefits everyone.

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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 EV3 project directly advances several objectives of the Illinois Climate Action Plan (iCAP), particularly in increasing energy efficiency and promoting clean energy sources. By developing electric vehicles, the project contributes to reducing campus energy consumption and decreasing energy use intensity (EUI). The integration of energy-efficiency stems, such as in-house battery development and regenerative braking, aligns with iCAP's goal to enhance campus-wide energy efficiency Furthermore, by promoting the use of electric vehicles, the project helps reduce reliance on fossil fuels and lower the carbon footprint of transportation, advancing the university's sustainability initiatives. In addition to its focus on energy efficiency, the EV3 project supports iCAP's objectives related to clean energy, by utilizing electric propulsion systems and exploring energy storage technologies, the project complements the university's efforts to integrate clean power sources like wind and solar into campus operations. The project also fosters innovation and hands-on student involvement in emerging clean energy technologies, contributing to ongoing research and development in this area. By advancing these clean energy studies, consumption.

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How many students will be directly impacted by this project?*

This project will directly impact over 140 students who are part of our team, providing them with the opportunity to become future leaders in green technology. Through their involvement, they'll gain a deeper understanding of sustainable energy systems while participating in technical training sessions on advanced topics such as regenerative braking and battery management. These students will also receive hands-on experience working on an industry-level project, allowing them to apply theoretical concepts to practical challenges. This experience not only enhances their technical expensise but also prepares them for careers in the growing fields of clean energy and automotive technology.

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How many students will be indirectly impacted by this project? *

Through our outreach events and workshops, we expect to indirectly impact hundreds of students in the broader community. Events like Mahomet STEM Night, which draws around 300 attendees, allow us to share our knowledge and passion for green technology with younger students. Additionally, our hands-on workshops, attracting about 30 participants each, cover essential skills such as soldering, PCB design, motors, battery management systems, and coding in C and Git. These workshops help expand technical skills while fostering interest in sustainability initiatives. We also host showcases close to competitions, where we test run our car and give the UIUC community an opportunity to see the vehicle in action. These events build excitement and allow students to learn about the innovations created by their peers, inspiring further engagement with sustainable technology.

What is the intended student impact? *

Be sure to address the following: -How will this project benefit students? -How will students be involved with this project? -What educational components are in your project?

 The EV3 project offers students hands- on experience and a deep understanding of sustainable energy systems, helping them become future leaders in green technology. By designing, building, and testing electric vehicles, students gain valuable trans the regulation builders with the shouldedge and resources to make a positive environmental impact. Students will be actively involved in posicialities students that collaborates to bing the vehicle to life. The Mechanical and Composites team creates the vehicle's body and mechanical systems, while the Electrical team manages internal wing and teatring, and outread.

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Project Finances

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Has your project team or department previously been awarded funding from the SSC for the same or a similar project? *

O YES

NO

42

OPTIONAL: Attach any letters of commitment or support here along with any supplemental media that will support your application (presentations, photos, etc.).

Sponsorship Proposal (1) Abby Gillham.pdf

SSC Presentation Fall 2024 Abby Gillham.pptx

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Download, complete, and submit the **SSC-Budget-Timeline-NEW APPLICATION-template** file linked below. Please be very detailed so that the SSC can fully evaluate the merit of your funding request.

https://studentengagement.illinois.edu/sites/default/files/2024-09/SSC-Budget-Timeline-NEW-APPLICATION-template.xlsx

SSC-Budget-Timeline-NEW-APPLICATION-template_Abby_Gillham.xlsx