



STUDENT SUSTAINABILITY COMMITTEE

Semesterly Report

Thank you for your commitment to green initiatives at the University of Illinois. One of the ongoing requirements listed in the terms of the funding agreement for your project is the submission of semesterly reports with key information about your project. In addition to this form, please provide additional financial documentation and/or progress photos if available.

Please be as accurate as possible in describing the project (including possible setbacks or challenges in meeting the initial goals of the project). Not fully meeting your project's goals will not disqualify you from making future funding requests as long as your reports are as complete and accurate as possible. If you have any questions, please contact the Student Sustainability Committee, at sustainability-committee@illinois.edu.

Project Name: Eco Illini Supermileage

Date of Report Submission: 3/31/2021

Project Purpose:

The Goal of the project is to design and build a high efficiency electric vehicle for competition in Shell Eco-Marathon Americas. The design and manufacture will be led by students giving them valuable skills in designing for sustainability.

Detailed Accounting of Expenditures to Date:

Excel sheet attached to submission

Commented [CGW1]: @Rhee, Michael

Project Progress to Date:

Our Car has made many improvements over the semester and has met some of the tasks outlined in the SSC Budget. We have achieved the rolling vehicle chassis on schedule with three wheels all attached to the car. The Vehicle has not completed production as we have had delays with our electric and body teams in manufacturing. This completion date is expected to be February 1, 2022.

For battery research and electronics efficiency, we are ahead of schedule. Figure 1 shows the improvements made in battery efficiency from left (Old) to right (New). The new battery is much more efficient and energy dense than the previous generations and will be used in the car for this year's competition. This means we beat our expected new battery deadline by about a year and a half.

Our improved motor controller is currently being worked on by an alumnus and is currently being tested on a dyno as seen in figure 2. Our electric motor is currently very capable of spinning but is still undergoing improvements to reach maximum efficiency.



Figure 1 3 Generations of batteries



Figure 2 Electric Motor Testing

Student Involvement and Outreach to Date:

Our students have been responsible for all work done on this project and have gained valuable experience. This work is done through a number of teams including mechanical, electrical, body, engine, and aerodynamics. The amount of work done is too much to detail in one report but some highlights are seen below with our mechanical team working on FEA (Fine-element-analysis) on their components to ensure they meet the safety standards. The Aero dynamics team has been working on analyzing our cars design to reduce drag and to inform design. Lastly, we have weekly meetings with our teams as seen in the engine team meeting where our members check-in and get help from more senior members to accomplish their projects. Some

of the key work that has been done has been seen earlier with the battery and motor design and manufacture to ensure our electric vehicle will work.



Figure 3 FEA Work on Components

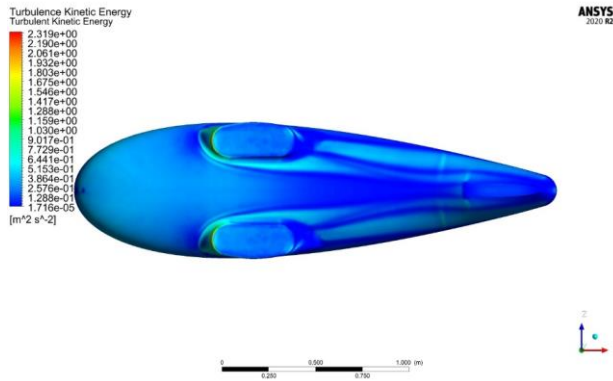


Figure 4 Aerodynamic analysis

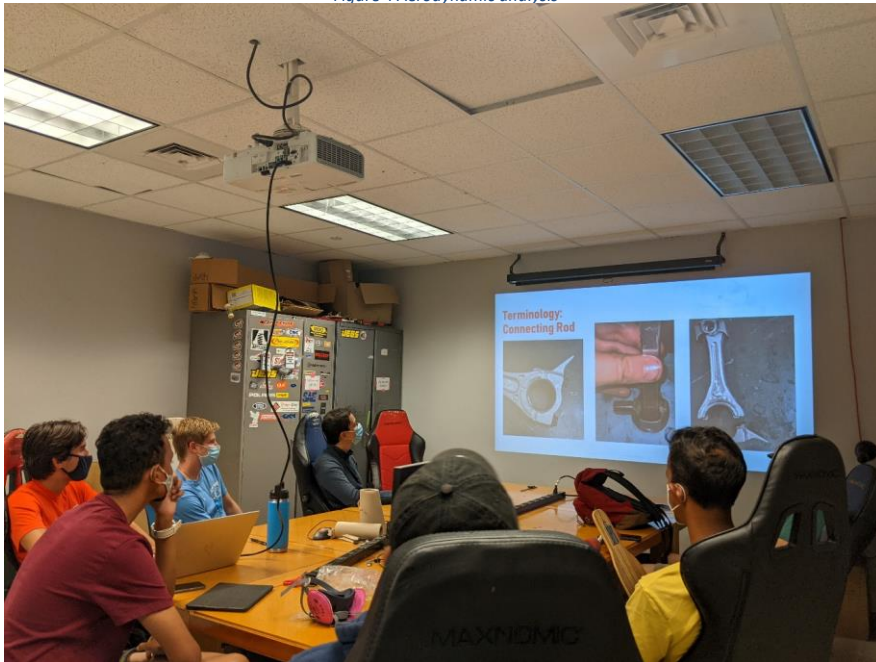


Figure 5 Engine team meeting

Marketing and Promotion Efforts to Date:

Our team also participates in several outreach events throughout the year. Some detailed below include the homecoming parade where we drove our G5 car through the parade showcasing the potential for sustainability in engineering. We also participated in the school's sustainability celebration and got to show how our work relates to sustainability on campus. We also participated in the SSLC Green quad day event and had some success recruiting.



Figure 6 Homecoming Parade



Figure 7 Sustainability Celebration



Figure 8 Green Quad Day

Additional Comments:

Any additional comments/relevant information for the semesterly report