



## STUDENT SUSTAINABILITY COMMITTEE

### Scope Change

*From time to time unforeseen challenges or opportunities can affect the planned budget, timeline, or overall goals of a project funded by the Student Sustainability Committee. Past examples of these situations include projects coming in under budget but having additional opportunities available, or inclement weather delaying the planting of agriculture projects.*

*Below please include a brief project summary and your requested changes. Attach additional documents as needed. If you have any questions, please contact the Student Sustainability Committee at [sustainability-committee@illinois.edu](mailto:sustainability-committee@illinois.edu).*

### **General Information**

**Project Name:** Diversion of Non-Recyclable Plastic using Pyrolysis Process to Produce Fuels for Campus

**Total Amount Requested from SSC:** \$140,000

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### **Contact Information**

Applicant Name: BK Sharma  
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## Project Information

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

The overarching goal of work that will be initiated under this project is to end landfilled plastic waste forever, by collecting, processing, and converting the plastic waste from the U of I waste transfer station MRF to a usable fuel that can be used in University vehicles. This will be achieved by demonstrating the continuous pilot-scale catalytic pyrolysis system for distributed production of the most desirable fuel for use in University trucks and generating data including mass/energy balance to make a business case for a commercial-scale system capable of using all plastic waste produced on campus. It also involves the introduction of this technology to students and involves them in conducting detailed process characterization to improve process yields and product quality and develop a student-led/run initiative like the Illini Biodiesel Initiative.

Please provide a summary of how students will be involved in the project's changes:

Students will learn about this technology while working on various tasks including:

- Installation and operation of the continuous plastic-to-oil system to be located at a pilot lab in ISTC;
- Record data on system operation;
- Collect and analyze various liquid samples; and
- Calculate and assemble feedstocks to process in the correct proportions for optimum operation and energy extraction.
- Accessible facility as a resource for students to learn/advocate about this technology

Students will be selected through the application process to work on this project. They will be involved in all tasks of this project and will be running this project under PI and Co-PIs guidance. Eventually, when the plastic conversion process is finally established, the project will be handed over to a student-led group like the Student Biodiesel Group.

There are many facets of this project that could serve as a research or thesis project across several disciplines and departments. Potential domains include:

- Chemical Engineering for fuel distillation and testing;
- Mechanical Engineering for system integration and operation;
- Electrical Engineering for system controls and power management; and
- Environmental Engineering for air emissions control and sampling.

Apart from the above, students will be able to conduct independent studies centered around the pilot plant. Examples of student roles would be access to data generated during pilot plant operation as input to follow-on analysis in courses offered on campus

Please provide a brief summary of your requested scope change. How is your request different from your original plan?

The SSC project, "Diversion of Non-Recyclable Plastic using Pyrolysis Process to Produce Fuels for Campus" started in February 2020 and was scheduled to be completed on January 31, 2022. The project started in February 2020 and was supposed to end on January 31, 2022, but due to the

COVID shut down in March 2020, the work was suspended, equipment and supplies purchases and delivery of equipment got delayed by almost a year and the project didn't progress as planned. Additional time would be required to complete the project as planned. I request SSC Board members for a no-cost extension for this SSC project until January 31, 2023. With requested project end date of 1/31/2023, the revised schedule will be as follows.

<b>Task</b>	<b>Timeframe (# of weeks to completion)</b>	<b>Estimated Completion Date</b>	<b>Revised Completion Date</b>
Demonstrate the feasibility of converting waste plastic to fuels	26 weeks	7/31/2020	7/31/2021
Engage students to identify the parameters	13 weeks	10/31/2020	10/31/2021
Support the education and training of students from various disciplines to study the effect of continuous operation on catalyst life	13 weeks	1/31/2021	1/31/2022
Involve students to study the impact of feedstock composition and quality	22 weeks	6/30/2021	6/30/2022
Evaluate and compare various fuels thus produced	17 weeks	10/31/2021	10/31/2022
Generate mass/energy balance data for the entire process	13 weeks	1/31/2022	1/31/2023
Create awareness in the larger community by participating in various outreach opportunities	104 weeks	1/31/2022	1/31/2023

**Additional comments (Optional)**

N/A