# *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**.*

# General Information

**Project Name:** Pilot-scale Implementation of Environment-Enhancing Energy (E2E)

**Total Amount Requested from SSC:** $150,000 for two years

# Contact Information

Applicant Name: Aersi Aierzhati (Faculty Advisor: Yuanhui Zhang)

Unit/Department: Dept. of Agricultural and Biological Engineering

Email Address: yzhang1@illinois.edu

# Project Information

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

Please address all of the above items including concrete examples of the desired outcomes

Our research team proposet to augment management of food waste produced through the dining halls on UIUC campus, via hydrothermal liquefaction (HTL) for biofuel production. This is an expansion of our Environment-Enhancing Energy (E2E) research program focusing on Waste-to Energy. More than 34 million tons of food waste were generated in the US in 2010 (EPA, 2010). According to Kelly Boeger, the Menu Management Dietician at the University of Illinois, 344,559 pounds (dry mass) per year of food goes unused by the cafeterias on campus, which was worth $425,735 or 2.46 % of the overall budget as of 2015 (Hettinger, 2015). This unnecessary spoilage costs at least the same amount for waste disposal and treatment, in addition to environmental burdens. On the other hand, this spoilage presents an opportunity for UIUC to implement new resource recovery technologies to alleviate waste and increase student activities directly related to sustainability. Hydrothermal liquefaction (HTL) is a technology that utilizes elevated temperatures and pressure to convert wet biomass to oil that can be used in motors or asphalts. This process potentiates greater sustainability by simultaneously remediating the food waste and producing renewable energy.

2. Please provide a brief summary of how students will be involved in the project’s changes:

Any relevant opportunities for student involvement in your project

During the first project year in 2019, our team is comprised of two PhD students and two undergraduate students under the supervision of Professor Yuanhui Zhang. By the summer of 2020, several undergraduate students that worked on the project have graduated including the lead student, Aersi Aierzhati. Since the Summer 2020 we have recruited one new undergraduate and two graduate student join the team. We are expecting at least one more undergraduate join the team in the spring of 2021, and one senior student capstone project team (3-5 students) work on the project in the Spring 2021. This project involves some chemical laboratory tests organized by two graduate students, which will be a good opportunity for undergraduate student to learn and improve their experimental and analysis skills. Undergraduate students will involve in different tasks such as food waste collection, conversion to biocrude oil, product upgrading, campus presentations, and other key responsibilities. These opportunities and presentations can include conferences, events such as Engineering Open House (EOH), and visitor tours. Overall, students will gain valuable practical experience on the sustainability of the campus and beyond.

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

The original objectives and scope of effort will remain unchanged. However, due to the COVID, the project schedule is delayed. While the HTL reactor operation requires at least three person at the same time, keeping social distance becomes prohibitive. We are expecting the work schedule back to normal by May of 2021. Thus we can complete the project by the end of 2021. Therefore, I request a non-cost extension for the project till December 31, 2021.

4. Additional comments (Optional)

Any additional comments/relevant information for the project proposal

None.