



ESW

BIOFUELS

Spring 2021 Newsletter

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Team Updates

Meet the new team members!

This semester, Biofuels took on four new members! Stephanie Albaña is a freshman majoring in Environment and Sustainability, and she has joined the Business & Outreach sub-team. Jonathan Marcuse is a freshman majoring in Environmental Engineering, and he has joined the Research and Development sub-team. Gabi Tan is also a freshman in environmental engineering who is on the Research & Development sub-team. Finally, Sitara Sastry is a freshman in environmental engineering and joined the Bioenergy Implementation team.





Team Updates

Updates on how B&O's FOG station at the Tompkins County Recycling Center has done!

The FOG drop-off station that the Business and Outreach team helped design and open in spring 2016 has recycled the following amount per year through Buffalo BioDiesel!

2019: 4.02 tons

2018: 4.51 tons

2017: 3.49 tons

2016: 800 gallons



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Business & Outreach

Business and Outreach took on several new projects this semester! The team assisted Professor Ruth Richardson, the former Biofuels advisor, and other Cornell faculty in setting up their Circular Northeast workshop and establishing long term contact with workshop attendees. The workshop brought together organic waste producers and anaerobic digester operators to reduce landfill GHG emissions from food waste. Another project the team took on was designing a lesson plan on how to design and construct a solar bike shed to support the Ithaca Green New Deal's Green Jobs Training program. B&O also set a date (10/23) to present sustainability science demos with the Ithaca Sciencenter next semester. The team also continued with website updates, including developing a Newsletter page, Apply Now page, and Contact Us page, as well as updating the Projects and Meet Us tabs. Finally, the team created the newsletter and organized merch.



Biofuels merch!

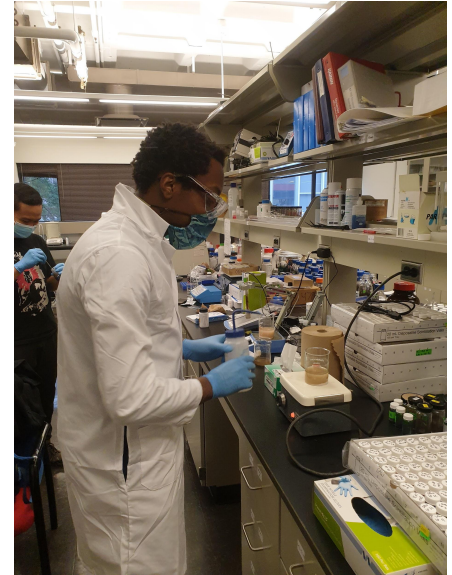
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Research & Development

The main focus of the R&D subteam was on continuing work on struvite production from acid-whey waste-streams. The team looked to continue working with the HTP project from last semester, but this had to be put on hold until the fall 2021 due to certain complications. The goal of the project is to see what waste-streams are viable for forming struvite, which can be used as a fertilizer. In the lab, the team did some phosphorus content testing and plant-available nutrient testing, involving extracting phosphorus and inorganic nitrogen from the struvite samples. Through Fourier-transform infrared spectroscopy (FTIR), the team was able to measure the abundance of various functional groups in the samples. After finishing this and running various diagnostics tests on the struvite samples, the team began analysis using x-ray diffraction and the data analysis software called Minitab, among other methods. The team is now focusing on writing up the final report to finish the semester.





Bioenergy Implementation

This semester, the Bioenergy Implementation team continued their work on the Teaching Dairy project, whose goal is to enhance a gasket in the equipment to prevent premature failure. They finished documenting the constraints considered when making the gaskets, cut the gaskets in the Olin Machine Shop, and visited the Teaching Dairy site to deliver the gaskets. They also focused on their REE TEA project, in which they re-created and modified calculations done by a previous bioleaching paper, as well as explored the effect of changing the feedstock from FCC (gasoline refinement waste) to RPP (lightbulb waste), and researched the economic effects of using alternative glucose sources to feed microbes. Regarding their Cirenas project, in which they have been working to improve the community's anaerobic digester, there are unfortunately not many updates. Due to the pandemic, funding has become an issue, so the team is unsure if they will continue the project.



BioImp visits Teaching Dairy

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Biodiesel Engine Project

This semester, the BEP taskforce has been working to collect and analyze data from the biodiesel vector system and incorporate it into a final feasibility report which will be presented to the administration of Cornell University. The vector system, which was installed on a tractor in Spring of 2020, has been collecting some data however the Portable Emissions Monitoring System (PEMS) that was attached needed further calibration. To obtain ever better emissions data, the BEP task force used GREET, a software from Argonne National Laboratory to calculate the environmental and economic life cycle impacts of the vector system. This information along with an analysis of the feasibility of wide-scale vector system implementation on the Cornell Campus was compiled into a nearly 30 page report for Cornell University. The taskforce also created a shorter, executive summary that summarizes the most important findings of this project.



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