



State University of New York
College of Environmental Science and Forestry

Office of the President

Dear AASHE STARS Program Staff,

This letter is being submitted in affirmation of SUNY-ESF's Biodiesel Production program as an Innovation credit in STARS. Initiated under the personal direction of ESF President Neil Murphy in 2006, the Biodiesel Production Program is part of the effort towards the goal of achieving carbon neutrality for the College. The project currently uses a BioPro 190 reactor to produce 50 gallons of B100 per week from waste cooking oil collected from neighboring Syracuse University dining facilities (ESF currently does not host any of its own dining halls).

Our Biodiesel Program is innovative in that it uses two steps: an acid catalyzed first stage for conversion of free fatty acids, then a base, NaOH reaction. This two-step process allows us to process poorer quality waste vegetable oil, as it removes the free fatty acids that have been broken off the triglyceride molecule, which can otherwise interfere with the reaction.

The biofuel is used for student transport and maintenance vehicles on campus. All diesel maintenance, physical plant, and snow removal vehicles run on a biodiesel blend year-round, with a minimum concentration of B20, or 20% biodiesel. On campus use and student transportation to remote campuses helps ESF use a much higher concentration of renewable fuels and to reach an end goal of a carbon neutral output.

Student involvement is a key part of our Biofuels Production initiative. Students from ESF, SU, and local High schools frequently tour the biodiesel greenhouse, where the process takes place, to see the production in action. Student participation is greatly encouraged, and many of the day to day operations and improvements to the project are helped along by student volunteers and work study students. The integration of students is an integral part of the production and design of the system. We have obtained funding from the Kaufman Foundation and gathered students, from ESF and Syracuse University, to analyze the feasibility of developing a business and to put into operation a green energy cooperative. In the first year of project, student analysis demonstrated the feasibility of the Green Energy Cooperative, if production could be expanded to utilize all the waste oils generated by ESF/SU. In the second year of the initial grant, a new group of students will perform similar analysis under changing market conditions. Additional funding from the Kaufman Foundation has facilitate the engagement of engineering students to design new production facilities for the biodiesel production, and to fabricate the new production facilities. The current production facilities are limited to 50 gallons of biodiesel per batch, and the equipment in use is not well suited for teaching and demonstration. By engaging students in the design phase of the enterprise, we expose engineers and scientists to the challenges of designing a process for a start-up business. In addition, we have been able to provide greater teaching and demonstration by engaging more diverse types of students. In multiple courses students have engaged in the design of the biodiesel production process. Engineers have focused on the design of the production facilities, science and business students review the economics and develop the business plan to deliver

biodiesel to ESF and SU made from waste oils available from the campuses, and first year chemistry students make biodiesel as part of their lab work.

The program also reaches into the Syracuse community. At the Westcott Community Center, a monthly 30-minute informative talk about the project is followed by a community oil collection where residents can bring their used cooking oil to be converted to biodiesel. Collections are held the last Monday of every month. In addition, the use of biodiesel at local organic farms for heating and farm equipment applications is currently underway at a number of area farms. Local residents and businesses are able to use ESF biodiesel after signing a waiver form and in exchange for a donation towards the program.

By producing biodiesel in this manner, and engaging in on-campus and community outreach, ESF is furthering our students' and the community's commitment to reducing greenhouse gas emissions in transportation and maintenance vehicles. Therefore, I believe that the ESF Biofuel Production program counts as a STARS Innovation credit.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael J. Kelleher", with a long horizontal flourish extending to the right.

Michael J. Kelleher

Director of Renewable Energy Systems
President's Office
SUNY-ESF