

## **Developing a USF-Community Partnership for Used Cooking Oil Collection and Conversion to Biodiesel Fuel**

### **Abstract**

Across the United States more than 100 million gallons of used cooking oil (UCO) are generated and disposed off annually. At the same time, over 2 billion gallons of biodiesel fuel are needed by buses, trucks, and heavy equipment. This interdisciplinary collaboration aims at developing a university-community partnership for used cooking oil (UCO) collection from households and businesses in the local community and conversion of the oil to biodiesel by USF students to replace fossil fuel in the USF bus fleet. The main goals are to (1) Transform UCO, a waste material that plagues water treatment facilities, into a resource for renewable biodiesel fuel that generates income for the community; (2) Empower the disadvantaged community around the USF campus to participate in the development of the green economy; and (3) Improve air quality and reduce greenhouse gas emissions in the area by replacing fossil fuel (diesel) with renewable fuel (biodiesel) use in the USF bus fleet.

With existing funding, project researchers have developed a novel technology that transforms cooking oil generated from USF food services to fuel for the buses. While this has been a technical success, the project is limited to oil generated at campus cafeterias. Economies of scale in biofuel production are important, so we propose expanding the project scale to the community level and adding a mobile collection component. Leveraging the existing funding with support by The Joy McCann Foundation, we will apply an interdisciplinary approach of sustainability, engineering, and urban planning to design and implement a framework for engaging the community in the collection of UCO through education and relationship building. It is recognized that the success of sustainability solutions is as much a science as a market and policy issue and our integrative framework will address that reality. We propose three applied research tracks: (1) Linear programming to guide technology choice and capacity decisions for UCO collection from residential and commercial sources; (2) System assessment from the perspective of urban infrastructure planning, examining issues such as supply/demand and biodiesel facility siting, as well as emerging and interdisciplinary issues, such as food waste systems; and (3) Management of the university-community partnership through community education by USF students and faculty, logistical support, and hands-on involvement in the project.

Principal Investigators: Dr. George Philippidis (Global Sustainability), Dr. Aydin Sunol (Chemical Engineering), and Dr. Evangeline Linkous (Urban Planning)