



Cal Maritime's Waste Cooking Oil to Bio-diesel

2019 RecycleMania Case Study

1. Contact info

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2. Focus of Case study

Reporting Cal Maritime's waste management program on converting used kitchen cooking oil to biodiesel fuel.

3. Detailed description of campaign component:

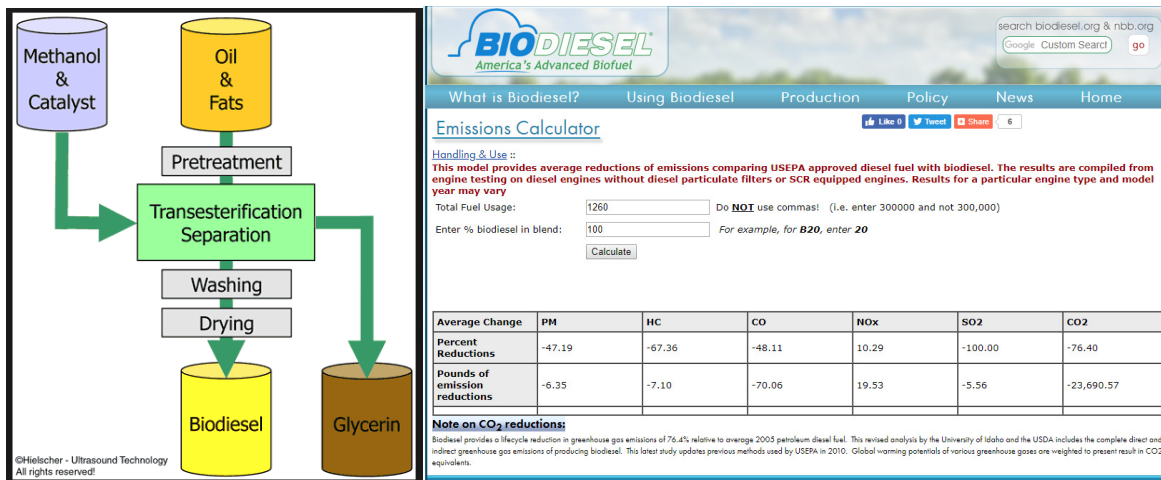
While this campaign is specific to the recycling of vegetable cooking oil, a brief description of the dining center and its services are described here:

California State University Maritime Academy is located at 200 Maritime Academy, Vallejo, CA. The University has 1,100 full time students and 350 full time faculty and staff. The campus kitchen is an advanced, efficient and environmental friendly facility, complying with local and state health requirements. A total of 1000 meals are served every day of the two semesters per year. In addition to the main dining facility, the Cal Maritime's Dining Services also operates McAllister Dining service and two Bistros. The food is served during breakfast, lunch and dinner times. Daily menu of the food served is posted on the campus internet under cafeteria services. This is the link for cafeteria services.

<https://dineoncampus.com/csumaritimeacademy>. The calorie information and dish names are displayed at each service station. The kitchen's major components are Cleaning/washing, Storage, Food Preparation, Meal Cooking, Service, and Waste Management.

Cal Maritime has a robust waste management program. The organic waste from the kitchen is collected and sent off to composting. All recyclables such as cardboard, paper cups, soda cans are recycled. Cal Maritime has eliminated the use of single-use water bottles, replaced with reusable water bottles, and boxed water.

Vegetable Cooking Oil: A total of about 1,630 gallons of vegetable oil is used in the cooking per year. The waste oil collected after cooking is stored in a tank from where a company by name NBPW Inc. hauls the oil every eight weeks to the bio-diesel facility. Approximately one gallon of cooking oil is converted to 0.9 gallons of diesel. About 1,500 gallons of cooking oil is hauled from Cal Maritime dining facility which when converted to bio-diesel produces about 1,260 gallons of usable bio-deisel fuel. The emissions avoided by not using straight diesel fuel is about 24,696 pounds per year. A simple diagram of how bio-diesel is produced is shown below.



4. Planning steps & timeline to implement:

List out in bullet format each of the steps involved in planning.

- The dining services management planned and implemented the bio-diesel program after conducting considerable research.
- The quantity of waste cooking oil generated is 1,500 gallons, which is about 90% of the total oil purchased. This validates our efforts towards preparing healthy food, minimizing waste and smart fuel generation.
- Waste cooking oil collector tank was setup outside of kitchen. The kitchen staff was trained on the process of collecting the oil and storing in the tank.
- NBPW, Inc. was contracted to pump out the oil from the oil tank and haul away for bio-diesel production. NBPW Inc. hauls the oil every eight weeks and gets paid for the quantity of the oil hauled. The cooking oil is then processed to produce bio-diesel fuel at the plant.
- It took about four to five months to plan and implement this initiative, which started in January 2017. The initiative is active and has been successful for the past two years.

5. Resources and stakeholders involved

- The cost to setup the oil collection tank was about \$3,000.
- Cal Maritime Senior Management and campus sustainability committee was in full agreement with this initiative and provided leadership support.
- Staff training was required to manage the collection of waste oil and storing.

- d. Bio-diesel oil hauler was selected to provide the hauling service.
- e. NBPW, Inc. compensates Cal Maritime for the oil hauled, thus generating revenue.

6. Describe the Results of this campaign component

- a. Recycling of cooking oil attracted attention of Campus Sustainability Director, Dining Services Vice President, University Vice-President and CFO, and the University President.

Educational and informational articles on the topic are being published in campus website and in other community bulletins. Cal Maritime's sustainability club conducts several waste management drives each year including, e-Waste, Sustainable move-outs, Earth Day, community cleanup, and coast cleanup.

A feasibility study is in progress to construct a biodiesel plant on Cal Maritime campus and process the cooking oil to produce bio-diesel. Collecting waste oil from neighboring restaurants is also being considered to be processed at this plant.

- a. Specific measurable impact figures, if applicable - Cal maritime has a robust waste management and recycle program. All students, faculty and staff are committed to reducing, reusing, and recycling. Cal Maritime's sustainability club conducts waste management drives each year including, eWaste, Sustainable move-outs, Earth Day, community cleanup, and coast cleanup.

7. What would you do differently in the future?

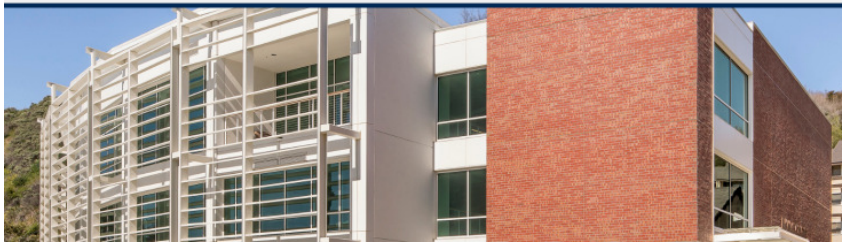
- a. Cal Maritime will continue to enhance its education and outreach efforts to increase active participation from students, faculty, staff and community.
- b. Form a Biodiesel Coalition and encourage other public organizations to use biodiesel fuel in their transportation fleet.
- c. Explore advanced technology available to accelerate the biodiesel process.
- d. Build a biodiesel plant on campus under a public private partnership initiative.
- e. Develop and display dashboard in the Dining Center, Student Center and in other high visibility areas showing the amount of cooking oil recycled, Carbon emission reduced, and associated economics.

8. What advice would you give to another college that wanted to do a similar effort?

Our advice to other colleges is:

- a. Develop a plan to collect and recycle waste cooking oil.
- b. Gather support from campus operations team and academia.
- c. Engage students and collaborate this effort with campus student sustainability club.
- d. Contract the hauling of waste cooking oil with a biodiesel processing company
- e. Document the amount of waste cooking oil delivered and fuel the amount diesel being generated.
- f. Document the avoided emissions and publish in campus website and in other community newspapers.
- g. Consider building your own on campus biodiesel plant and generate income.
- h. Consider forming a bio-diesel coalition and promote the use of biodiesel in business fleet.

9. Photos and Graphics



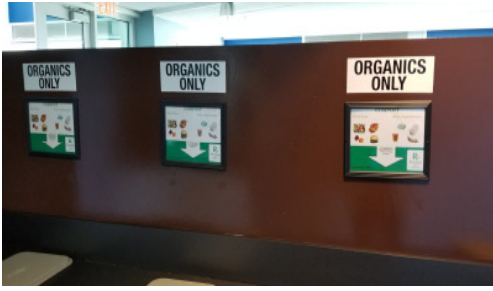
Cal Maritime Dining Center Building



Main Hall Eating Area



Waste Cooking Oil Collection Tank



Composting Signage in the Food Waste Area



Waste Food Bin outside Kitchen