

Automatically operated Bio-Diesel production unit project

1.1 What has been done?!

1. Research on biodiesel production process, methods & the required raw material needed for the process (waste cooking oil + catalyst + alcohol)
2. Alcohol and catalyst were purchased for a manual experiment, and we produced a sample of biodiesel (manual)
3. The unit is drawn on solid works with detailed dimensions, material & tanks arrangement.

Note: the unit consists of 5 tanks (3 acrylic & 2 stainless steel) one for each of the following (oil, catalyst, alcohol, reactor, separator)

Heater in the reactor tank is needed to reach the required temperature for the process (60 c)

Mixer in the reactor, as agitation is needed to finish the production process.

Arduino and some electrical components for the automation (motors, relay, motor driver,...etc.)



our Bio-Diesel product (manual trail)

1.2 What is to be done?!

1. Purchase material needed for tanks fabrication.
 2. Purchase sensors (level, temperature, pressure, color, torpidity) as the process is automatic.
 3. Purchase heater, mixer, pumps, valves, and hoses for the unit assembly.
 4. Purchase motors and electrical components to run the unit.
 4. Run the unit and test the final product compared to the ASTM standards.
-

2. what is the current process to collect and dispose of used oil, is there any stats on reused or collected amounts local and global?

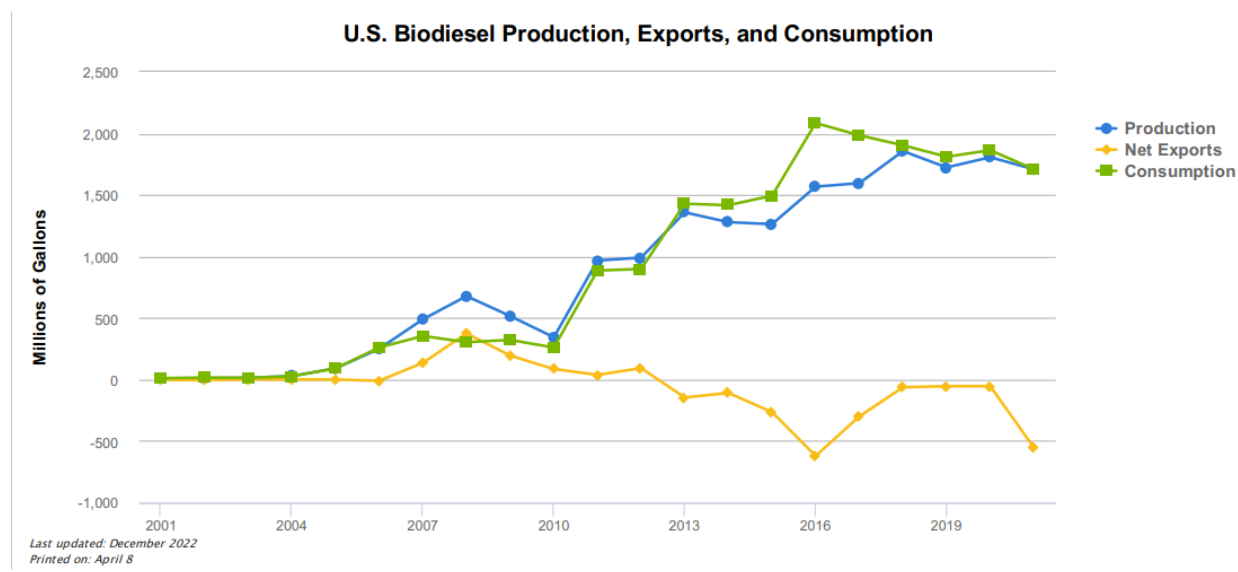
Usually, the used oil is disposed of by throwing it into the sewers.

Therefore, converting it into fuel (biodiesel) is a safer and solution for the environment and more economical.

According to the United Nations Office for South-South Cooperation (UNOSSC) report in 2017, Egypt produced 500,000 tons of WCO from various resources including food industries, restaurants, and hotels.

Some of them used to produce biodiesel.

In our project we will collect the waste cooking oil from restaurants.



3. Proposed funding method?

As the fabrication of tanks must satisfy a lot of conditions (pressure, temperature, chemical reaction, mechanical stress) a strong and expensive material is needed (acrylic, stainless steel) and the project is ready for fabrication, so the funding method is preferred to be in cash method.

4. who owns what in this project, what is the business model, if there is one?

The project is a graduation project, so the faculty of engineering university of Alexandria owns it.

There is no business model, but the next step is to make an industrial product to the market.

For each batch

1. We will have 25 liter (22 kg) of waste cooking oil.
2. 5 kg of methanol
3. 425 grams of KOH

We will try on several batches (different kinds of catalyst and oil) to reach the maximum efficiency and the standards of ASTM
