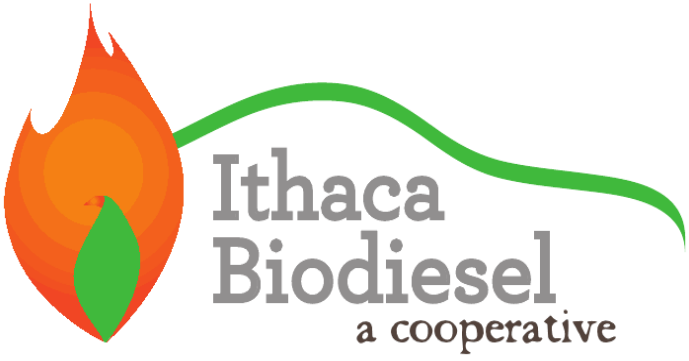
Ithaca Biodiesel Cooperative

Applicable Codes, Regulations, and Information Pertaining to Biodiesel Cooperatives



[Executive Summary]
The Mission of Ithaca Biodiesel Cooperative, Inc. is to provide high quality, affordable, local biofuels produced in a democratic community setting. The cooperative aims to be equitable and just to all members, responsible to the environment, accountable to customers, and profitable for the local economy.

Ithaca Biodiesel Cooperative aims to meet its mission through being a worker and community owned and invested cooperative that uses waste cooking oil to make biofuels, including straight vegetable oil for converted diesel vehicles and biodiesel for standard diesel vehicles. The cooperative also plans to offer biodiesel for home heating furnaces. Diverting waste and offsetting the use of nonrenewable sources such as petroleum and natural gas are inherent goals of the cooperative's processes.
Founded in 2007, the cooperative is currently poised to scale up the level of its production to serve more people in the greater Ithaca area with a locally produced and distributed renewable fuel. Utilizing four years of experience making biodiesel at its old facility in Enfield, NY in conjunction with new partnerships and consulting relationships, Ithaca Biodiesel Cooperative is prepared to design a flagship biodiesel facility; one that is safe and efficient to use, accessible to customers, and replicable by other communities interested in developing local energy security through environmentally safe and socially just methods.

This document serves as a plan to enable the Town of Ithaca Zoning Board of Appeals to grant Ithaca Biodiesel Cooperative with a use variance to begin production at the cooperative's desired facility, 614 South Elmira Road. With permission from the Town of Ithaca, Ithaca Biodiesel Cooperative may begin the process of becoming a certified, registered, and viable producer and distributer of sustainable biofuels.

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[The Biodiesel Production Process]
A basic description of the biodiesel production process, at any scale, involves filtering vegetable or animal fats (in our case, waste vegetable grease), removing the water-based component, heating it, and mixing it with a catalyst at around 130 ° F. The catalyst is methoxide, usually prepared from mixing methanol with Sodium Hydroxide (Lye, NaOH) or Potassium Hydroxide (KOH), but it can also be purchased pre-mixed, which reduces hazards associated with biodiesel production significantly. Once the reaction occurs between the heated oil and the methoxide (which requires approximately 2 hours), the product is allowed to cool and settle, which allows a byproduct of the reaction, Glycerine, to separate out as a heavier layer. It is easy to drain this layer out into a separate waste Glycerine tank. Then the remaining material, which is mostly biodiesel, is rinsed with warm water to draw out any unconverted oil molecules, lingering methoxide, and/or Glycerine. After letting this water phase settle out, it is easily drained out into a separate waste water holding tank. Further separation of wastes can occur here, or the material can be pumped directly into a rendering truck for removal.

The finished, rinsed biodiesel is left to dry over several hours, sent through a final filter to remove any particulates or water, and tested for quality (as per the ASTM D6751 standards listed below in the "Codes and Regulations" section). As materials are moved through each processing stage, new filtered waste oil is brought in to start the next batch.

[Codes and Regulations]
The following codes and regulations are required or recommended for biodiesel production in New York and the United States.

For Process:
ASTM D6751 (required) - This is the newly updated (11th) edition of the American Society for Testing and Methods' standard for minimum quality 100% biodiesel (B100). Every batch of fuel produced by an certified producer must be tested against the ASTM standard, and testing is usually conducted by a 3rd party laboratory. Separate standards are used for assessing biodiesel:diesel mixtures (aka B5, or B20). The multiple components of the D6751 test measure: Calcium & Magnesium content; Flash Point; Water & Sediment Levels; Kinematic Viscosity; Sulfated Ash, Sulfur; Copper strip corrosion; Cetane #; Cloud Point; Carbon Residuee; Acid #; Free & Total Glycerine levels; Phosphorus Content; Distillation Temperature; Sodium/Phosphorus combined content; Oxidation Stability.

EPA - 40 CFR Part 79 (required) - This component of Federal regulations involves registering our fuel for on-road use, which requires presenting laboratory results proving our fuel meets ASTM D6751 specifications. Applicable form: 3520-20A

EPA - 40 CFR Part 80 (required) - This component of Federal regulations involves registering our refinery with the EPA. A specific requirement of this program is to attach a 38-digit Renewable Identification Number (RIN), to every batch of biodiesel, that we make and sell. This RIN encodes all the relevant details about that batch, stays with the batch of fuel as it's sold, and ensures the tracking of quality of renewable fuel as it changes hands. Further, if we produce less than 125,000 gallons of biodiesel annually, we will be considered a small refiner, which exempts us from certain regulatory requirements. Applicable form: 3520-20B1

National Biodiesel Board BQ-9000 (recommended) - Accredition program requiring basic quality control measures for biodiesel producers and marketers, akin to the ISO-9000 accredition program.

For Building/Site:
NYS Building Code, Chapter 3, Section 307 (required) - This section describes the different building classes, and indicates what building class would describe our biodiesel refinery - H-2 or H-3 (depending on the interpretation of the Ithaca Town Code Enforcement Department). These categories have accordant degrees of safety regulations, with which we will need to comply.

Town of Ithaca Building Code, Chapter 225, Section 4 (required) - This code regulates Sprinkler Systems, and stipulates that new building construction, or modifications to an existing building that exceed 50% of the replacement cost of the building, require the installation of sprinkler systems that satisfy applicable NFSA and NYS Uniform Fire Safety and Building Code regulations, as judged by the Ithaca Town Director of Code Enforcement.

NYS DEC Part 596 (required) - This code requires facilities to register with the DEC all tanks on site that are greater than 185 gal in capacity, that are used for storing hazardous chemicals.

For Waste:

EPA Spill Prevention Counter Control - 40 CFR Part 112 (required) - This regulation requires a biodiesel facility to submit and maintain on file a description of how the facility design and administration will prevent any potential spills from contaminating adjacent and local surface water and property. Our primary strategy will be to conduct external oil and biodiesel transfers (onto and off of trucks), on a concrete containment dyke, and commit a designated pump and recollection infrastructure to removing the spill promptly into an ancillary waste/recapture vessel.

DEC 6 NYCRR Part 211 (required) - This section of NYS DEC code addresses general air pollution issues. Domestic manufacture of biodiesel for domestic use is exempt from Air Quality permitting as a trivial activity (Part 201-3.3). However, if process equipment is operated 300 hours or more per year, 6 NYCRR Part 236 invokes numerous emission control, monitoring, repair, reporting, and record keeping requirements.that emissions from biodiesel plants be monitored, recorded, and reported on a regular basis. Acquiring an air emissions permit is required, but emissions from biodiesel facilities are typically small enough to avoid additional regulatory steps.

EPA NSPS (New Source Performance Standards) 40 CFR Part 60, Subparts NNN, RRR, and VV (required) - This section of Federal Regulation requires that biodiesel producers apply for a stormwater permit, and specifically, to have engineering and administrative plans in place to address stormwater runoff issues, and prevent inadvertent discharge due to storm conditions.

We plan to manage our waste removal via chemical waste rendering companies; so at this time, we do not plan to need a NYS DEC State Pollution Discharge Elimination System Permit. Our relationship with Northern Biodiesel, Inc. (whose daily production volume = 25000 gal of Biodiesel) will bode well for the development of adequate, comprehensive, and environmentally safe wastewater handling procedures.

Wastes generated from biodiesel production are limited to: 1) Waste oil and food debris filtered out before production; 2) Glycerine and unconverted vegetable oil resultant from the production process; 3) Wash-water produced during post-production, and which consists primarily of water, and secondarily of unconverted vegetable oil, and unused methoxide.

Our waste disposal plans will all be approved by the appropriate agencies and executed by competent individuals. In several cases, the wastes can in fact become feedstock product to other operations, which increases our process' profitability and our efficiency. Notably, glycerine, when properly tested and treated (if necessary), can serve several roles. We plan on selling or donating it to local soap-making groups (such as Blue Moon Botanicals), or to research-industrial collaborations in anaerobic digestion processes (such as requested by Cornell University professor Lars Angenent, la249@cornell.edu).

We have a standing relationship with Cayuga Compost to compost the hardened oils, water and debris we filter out in pre-production. We also have the opportunity to sell this lower grade feedstock to other biofuel operations for further refinement of desirable components.

Finally, the wash-water produced in post-production requires the most careful attention. We will avoid any drain disposal (which would require a DEC SPDES permit), and instead contract for its regular removal by a rendering company, who will screen out methoxide, oil and/or glycerine for further use.

This wash-water is classified at high volumes as a Hazardous Waste and requires that a properly trained and certified individual (with DOT and OSHA) execute the transfer of possession.

Prior to pick-up of our wastes, it will be stored in dedicated storage vessels, properly contained and plumbed to optimize both efficiency in normal operations and counter control in emergencies.

For Chemical Storage:
Below is a list of chemicals we will use and the anticipated average volumes we will store, towards the production of Biodiesel.

Storage limitations, permits and fees are regulated by DEC regulation Part 596 - all volumes listed below will be allowable, when properly stored, pursuant to this code.

*Sodium Methylate**	*1500 gal*
Isopropyl Alcohol	*5 gal*
Sulfuric Acid	*10 gal*
Dudalite	*500 lbs*
Waste Vegetable Oil	*10,000 gal*
Biodiesel	*10,000 gal*

*S*odium methylate* will be bought pre-mixed (instead of being mixed on site from Sodium Hydroxide and Methanol, which would add significant and unnecessary hazards to production operations)

Taxation (specific to Biodiesel production):
Federal Fuel Tax, Form 637 (required) - This involves registering our fuel with the IRS, which also makes us eligible for the $1.00/gal Biodiesel Income Tax Credit.

NYS Sales Tax Law 12-A (required) - This state tax law applies to anyone selling biodiesel for diesel motor fuel or heating oil and requires that we register as a distributor with NYS Department of Taxation and Finance and pay the appropriate excise, sales and petroleum business taxes.