



Biodiesel in Connecticut

Presentation for SWMP organics subcommittee

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What to expect today

⇒ Brief overview of

- What is biodiesel
- How it's made, feedstocks
- How it fits into State's renewable energy strategy, climate change plan, etc.
- Who's using it in CT
- Production facilities in CT
- Recent legislation
- Regulatory issues

What is Biodiesel?

- ⇒ Alternative Fuel made from
 - virgin vegetable oils (such as soy, canola)
 - waste greases
 - Biodiesel contains no petroleum, but it can be blended with petroleum diesel to create a biodiesel blend.
- ⇒ Typical blends
 - range from 5% to 20% biodiesel with the remainder made up of #2 diesel

How is Biodiesel made?

- ⇒ oils and fats are filtered to remove water and contaminants.
- ⇒ mixed with an alcohol (usually methanol, sometimes ethanol) and a catalyst (usually sodium or potassium hydroxide).
- ⇒ This chemical process is called **transesterification** and results in the glycerin being separated from oil/fat.
- ⇒ The process leaves behind two products -- methyl esters (chemical name for biodiesel) and glycerin.

Biodiesel Process

- ⇒ The process leaves behind 2 products:
 - methyl esters (the chemical name for biodiesel), and
 - glycerin (a by-product usually sold to be used in soaps and other products).
- ⇒ To learn more about how biodiesel is made visit
www.ecohusky.uconn.edu/biodiesel.html

Feedstocks

- ⇒ Soy, canola, other oils - mostly for the mid-west?
- ⇒ Yellow waste grease - from fryolators at restaurants, bakeries, other food service providers
 - Currently collected then picked up by renderers;
 - Nearby rendering facilities in MA, RI, NY, NJ
 - Used in animal feed, cosmetics, soaps, etc.
- ⇒ Brown, non-renderable grease – from grease traps at restaurants, food service industry
 - Collection and disposal of Fats, Oils, Greases (FOG) regulated by DEP

Restaurant Grease Generation rates

- ⇒ From NREL report:
- ⇒ Yellow grease: range 3 to 21 lb/yr/person;
weighted average 8.87 lb/yr/person
- ⇒ Brown grease: range 1.5 to 26 lb/yr/person;
weighted average 13.4 lb/yr/person
- ⇒ • **TOTAL: 22 lb/yr/person**

State strategy, plans

- ⇒ 1. Governor's Energy Vision – Fall 2006
 - By 2020 - all commercial transportation fuels sold in CT will be a mix of 20% alt fuels
 - By 2020 - a mandatory mix of 20% of biofuels in all residential and commercial heating oil

- ⇒ 2. Climate Change Action Plan - Jan 2005
 - Recommended Action 25 – fuel switching: Test B20 blend for heating in state facilities, then increase use.

State strategy, plans, cont.

⇒ 3. DPUC ruling - June 2005

- Biodiesel qualifies as a renewable energy source, and will be considered a Class 1 Renewable (must meet definition of biodiesel as defined by U.S. DOE and meet ASTM standards).
- When blended, only the biodiesel portion receives Renewable Energy Credit
- Facility must also meet emissions requirements
- Each facility using biodiesel must apply to DPUC for renewable energy Certification

Who's Using Biodiesel in CT ?

- ⇒ CT DOT for equipment (B20 blend)
- ⇒ CT Residential homes - home heating oil distributors (B5 blend) – about 75 in CT www.ipca.org
- ⇒ Santa Energy - New Haven fueling station
- ⇒ NEW!! West Cornwall – fueling station
- ⇒ CT Clean Cities Program
 - Municipal Fleets - B20 (New Haven /B50 warm weather, Cheshire, Glastonbury, Sharon, Salisbury);
 - School buses (Glastonbury)
 - Yale University & Yale-New Haven hospital buses

Biodiesel Production in CT

- ⇒ BioPur – Bethlehem, CT - up to 400,000 gals/yr
- ⇒ Planned production facilities:
 - Suffield
 - Cheshire
 - Southington
 - ???

CT 2007 Legislation - PA 07-4

⇒ Sections 51 – 59 biodiesel

⇒ Provides definitions, funding, etc.

- CT biodiesel producer incentive account
- DECD will administer account, create guidelines
 - CT Center for Advanced Technology (CCAT) will administer program for DECD; begins Jan 2008?

CT 2007 Legislation - PA 07-4

- ⇒ 1. Producers - eligible for grants per gallon of production
 - first 5 million gallons – 30 cents/gal;
 - next 5 mil gals – 20 cents/gal ;
 - third 5 mil gals – 10 cents /gal
 - 1 time grant for equipment or construction, modification or retrofitting production facilities (\$3 million, 25% of cost)

- ⇒ 2. Distributors also eligible for grant \$
 - For cost of creating storage and distribution capacity
 - Up to \$50,000 for any one distributor at any one site.

PA 07-4, cont.

⇒ Institute for Sustainable Energy (at ECSU):

- Compile and distribute educational materials on biodiesel
 - Website on CT biofuels (legislation, info for school age children, other guidelines) - www.ctbiofuelinfo.com
 - Hold workshops for fleet operators

- Establish and administer CT Biodiesel Link program
 - Inventory and create database of waste vegetable oil from restaurants, schools, institutional cafeterias, other institutions/business

Regulatory Issues

- ⇒ OPM state agency workgroup (DEP, DECD, DPS State Fire Marshal)
 - Training sessions for local fire officials being developed for Feb 2008 workshops
 - Building code, fire code, environmental issues
 - Possibly a Guidebook for Biodiesel Producers – proposed
 - Target audience – developers of production facilities
 - Contents: environmental considerations, including permits, siting, design, construction

Regulatory Issues

- ⇒ DEP Permitting – facility by facility basis depending on the process, amount of materials being stored, etc.
 - Could require Air, Water, Waste permits
 - Waste yellow grease – DEP determination TBD
 - Brown grease already regulated via Fats, Oils, and Greases (FOG) General Permit - must go to regional location - New Haven, Torrington, Windham WPCFs

FOG

- ⇒ **General Permit for the Discharge of Wastewater Associated With Food Preparation Establishments**
 - For disposal in Connecticut, the contents of all grease traps shall be disposed of at a regional Collection / transfer / disposal site
 - New Haven, Torrington, Windham WPCF – Fractionation Tanks
 - Brown grease collected and disposed in CT not for biodiesel
 - http://www.ct.gov/departments/departments/Permits_and_Licenses/Water_Discharge_General_Permits/food_prep_establishment_gp.pdf

Other Information

⇒ UConn Biodiesel Consortium

- Held 2 workshops – last one Jan 2007
- <http://www.ecohusky.uconn.edu/biodiesel.html>

⇒ Local Trade Associate formed:

- CT Biodiesel Association recently formed

CT DEP Biodiesel web page:

http://www.ct.gov/dep/cwp/view.asp?a=2708&q=323870&depNav_GID=1763