

Alternative Fuels:

A Roundtable Discussion

on the

Use of Biodiesel

in Municipal Fleets

Summary of discussion held on September 6, 2007
As part of the CT Road Scholar Certificate Program

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Discussion Highlights

The following is documentation created from the discussions held during the *Roundtable Discussion on Biodiesel as an Alternative Fuel* held on September 6, 2007 in Hartford. More than 30 municipal representatives came together from 22 different towns to discuss the use of alternative fuels and biodiesel. Ric Hosley, Jr, a biodiesel expert and vendor, discussed how biodiesel works along with the benefits of biodiesel and Steve Russell, Fleet Manager for the City of Keene NH, came and spoke about his experiences using biodiesel for the last six years. The following are highlights from the presentations and the ensuing discussion.

Presentation by Ric Hosley Jr, Hale Hill Biofuels

-- What is Biodiesel?

A renewable diesel fuel substitute that can be made by combining any natural oil or fat with an alcohol and lye to chemically separate glycerin molecules from the biofuel. Most biodiesel is made from soybean oil but can be made from other vegetable oils, recycled cooking grease or animal fats.

--There are three positives and three negatives in using biodiesel.

Positives:

1. **Renewable** – we can make biodiesel and it will not run out.
2. **Emissions** – The emissions are greatly reduced compared to diesel.
3. **Lubricity** – According to the National Biodiesel Board, Biodiesel lubricity exceeds that of petroleum.

Negatives:

1. **Can be more expensive** – mostly due to supply and demand. Although Towns in CT using it are only seeing a few cents difference from regular diesel.
2. **Cold Flow Properties** – Gelling temperature is higher than petroleum. Can be solved with additives and blend levels
3. **Quality** – There are standards set for petroleum. While there are standards for Biodiesel (ASTM 6751), not all producers are accredited or certified suppliers so must check before purchasing.

--Biodiesel can be blended with regular diesel in different amounts.

- B5** 5 parts biodiesel 95 parts petrodiesel
- B20** 20 parts biodiesel and 80 parts petrodiesel
- B100** Pure biodiesel

Biodiesel is rarely sold in its pure or unblended state.

--Who Uses Biodiesel?

Nationally, the USPS and Armed Services all use B20. In Connecticut, the State fleets, including DOT trucks and equipment, use 312,000 gallons a year, CT Transit is testing Biodiesel with kerosene, the Towns of Glastonbury, Essex, Cheshire, Salisbury and Sharon are all using blended biodiesel (B5, B10, and B20).

School Bus fleets, Marine fleets including Western Prince Whale and Wildlife Tours and the Lake Champlain Ferry, and Amtrak are also using it in varying blends.

-- Why are fleets switching to Biodiesel?

- Seamless and transparent with existing petroleum infrastructure
- Blends easily with current fuel pool
- High Cetane (Biodiesel=50 vs. Petrodiesel=40)
- High Lubricity (process of removing sulfur from petrodiesel has lowered lubricity)
- BTU content (128,000 comparable to kerosene)
- Higher Flashpoint (>300 degrees vs. 117 degrees for petrodiesel)
- Environmentally friendly – fulfills environmental and energy security – renewable, cleaner burning, reduction of greenhouse gases
- Performs very similarly to low sulfur diesel in terms of power, torque and fuel.
- non-toxic – no fumes= no headaches from personnel

-- How will using biodiesel affect warranties?

As long as the biodiesel being used meets ASTM standards, most major engine companies will not void their parts and workmanship warranties. More information on specific companies can be found on the National Biodiesel Board website – www.biodiesel.org but major companies such as John Deere, Detroit Diesel, Case IH, Scania, Ford and Caterpillar all approve blends of B20 with some approving B100.

-- Tips for ensuring quality of fuel once it is delivered:

- Conduct a visual inspection of your fuel.
 - Put samples outside on a shelf with a thermometer and watch the fuels as the temperatures change and time goes by. You will be able to tell if things are getting cloudy, etc
- Put additives in when things are warm and be sure to agitate to get a good mix
- Get a clear filter for your tank / pump to see what is happening to your fuel

Presentation by Steve Russell, Fleet Manager, City of Keene, NH

Steve Russell has been using B20 in Keene's fleet for the last six years. They switched over without telling anyone so they could get honest feedback from personnel on its performance. His staff (especially his mechanics) love it! Since 2002, they have used over 200,000 gallons and use it in their entire diesel fleet including highway, parks and recreation and emergency services.

Once the information went public, they received a very positive response due to reduction of carbon emissions and other environmental benefits.

They have had no problems reported on any of the 68 pieces of equipment although they did have some very minor issues with replacement of fuel filters, etc due to the build up from previous fuel usage (biodiesel acts as a cleaning agent). After a couple of filter changes, everything has run smooth.

-- He uses B20 in the following equipment/engines:

- Case Cat New Holland John Deere Cummins Detroit Diesel
- Kohler (from a 1969 Ingram roller to a 2007 Ford F450)
- Ladder Truck (has experienced no problems – very dependable)
- Several older trucks (1985, 1989) are working great. No loss of power.

-- No adverse changes to equipment

- They have seen no reduction in power and have received no complaints from staff regarding operations.
- They have actually seen an increase in fuel efficiency of about 1-2 miles per gallon.
- Have witnessed increased quietness
- Increased lubricity
- Preventative maintenance is easier – equipment is cleaner.

-- Health benefits of using B20:

- Operators have fewer headaches (they don't want to switch back to regular diesel)
- They studied air quality at the Keene Transfer Station (grant funded project with Keene State College) and found that particulate matter was reduced by 50%

-- No Gelling Problems –

They have seen no negative effects based on temperature. The City of Keene experiences many subzero days each winter and performance was not compromised. The key to good cold weather performance is to make sure that the bio portion of the biodiesel is winter blended.

The City of Keene has an aboveground storage tank. The best time to additize fuel (add the antigelling additives, etc) is when you are putting it in the tank...at the rack with injection additizing. A good tip is to get a letter from your supplier that guarantees the fuel to a certain temperature. It is best to have the supplier additize the fuel, not the manufacturer.

-- Department feels good about helping the environment and the U.S. reliance on foreign oil.

- The use of biodiesel in the City's 68 pieces of equipment means 417 tons of CO2 is eliminated each year.
- "The day B20 was put into the tank in the City, we reduced our dependency on foreign oil by 20%"

-- Other positives to biodiesel:

- Integrates with existing fueling infrastructure
- Low risk - easy to phase in and out

Roundtable discussion on biodiesel use in CT

Mary Visone, Purchasing Agent for the Town of Glastonbury gave a short presentation on Glastonbury's experience. They have been using some form of Biodiesel for a few years and have been very happy with it. They started with a test tank and made sure to convert during a warmer time of year so they wouldn't have to worry about any cold flow issues. They have been using it in their highway fleet and their board of education fleet. Highway has not experienced any issues but there was a small filter issue with some of the school busses. The town theorized that it was the type of biodiesel and the fact that the filter location made it so it wasn't getting heated from the engine. However, they switched filters and had no further problems. Glastonbury will be switching their emergency vehicles to B5 this year.

George Noewatne, Deputy Director of Public Works for the Town of Cheshire talked about how Cheshire switched to biodiesel. They converted last year to B5 and they switched to B20 in Spring 2007. Their experience has been very positive and has been everything the vendors said it would be. They have had no performance issues or complaints from their staff. It has been a good decision all the way around, including public relations and good press.

The following topics and related questions were discussed among the participants:

1. Performance of Biodiesel

- Should operators leave engines idling? Steve from Keene stated that trucks should not be left idling. This isn't just with biodiesel but with any engines. Unless you need to keep something inside the vehicle warm (i.e. ambulances) then no idling is needed. Ric from Hale Hill Biofuels stated the new Tier Three engines actually perform better with biodiesel than with the ultra low sulfur diesel. Most participants agreed that it is hard to get operators to stop idling the vehicles – especially in the colder months.
- Can maintenance schedules be changed with biodiesel? Cheshire has experienced greater lubricity and has seen that their oil is cleaner. Steve from Keene has also seen much cleaner oil coming out of his equipment. Neither has decided to extend the period between oil changes and other preventative maintenance but Steve suggested that if you are doing Preventative Maintenance on a shorter schedule than recommended by the manufacturer, you could definitely go to the manufacturer's recommended schedule.
- Some other uses for biodiesel –B100 can be used to clean asphalt off of tools and truck beds and can also be used as a coating to help get materials to slide off. Steve from Keene uses it in his parts washer too.

2. Purchasing Biodiesel

- How much does it cost to convert to biodiesel? George stated that the only costs they saw was the increase in the cost of the fuel itself...only a few cents per gallon. There is a difference in cost between B5 and B20. George said that the cost difference in switching from B5 to B20 (they purchased 40,000 gallons) was 10 cents per gallon or \$4000.

- What is the best way to buy it? Mary from Glastonbury said the key to purchasing biodiesel is timing. She suggested that since volume drives the price, towns should go out to bid when the state or RPO (like CRCOG) does. It is safer to lock in to a set price for the season or year because it is a very volatile market. There is a supply and demand issue right now but as the demand increases, so will the supply and eventually things will even out.
- How do you get your town on board? George from Cheshire stated that biodiesel was not a hard sell for him because of the environmental benefits. Steve from Keene agreed and stated that it has actually helped him to get some of his budget back. The first thing he “put on the chopping block” during budget cuts was the biodiesel and the Council ended up giving him more money. They didn’t want to switch back.
- Are there any programs available to help get towns started? Mary from Glastonbury mentioned a bill on the table which would provide grants for phasing in biodiesel but that it didn’t make it this session. She encouraged participants to reach out to their legislators.

3. Process of using biodiesel

- What types of additives are necessary? Steve from Keene uses Arctic Express in Winter and hasn’t had any issues with his fuel going bad. George in Cheshire says he uses 3 different additives, including an anti-gelling additive. In addition, they treat their fuel tank twice a year.
- How do you store the fuel? George uses a well insulated above ground 4000 gallon tank. Steve from Keene stated that it works equally well with above ground and below ground tanks.