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Comments Submitted to the Connecticut Department of Energy and Environmental Protection

Relating to

Governor's Council on Climate Change (GC3)

The National Biodiesel Board

The National Biodiesel Board (NBB) is the national trade association that represents the biodiesel and renewable hydrocarbon diesel industries as the coordinating body for research and development in the U.S. It was founded in 1992 and has developed into a comprehensive association that coordinates and interacts with industry, government and academia. NBB's membership is comprised of biodiesel producers, feedstock and feedstock-processor organizations, fuel marketers and distributors, and technology providers.

Comments

NBB commends the Connecticut Department of Energy and Environmental Protection for its role in the Governor's Council on Climate Change (GC3). We believe that the GC3 process will be a highly valuable means for charting a path forward to a sustainable energy future.

NBB is supportive of the GC3 initiative and wishes to offer the following information and recommendations:

Greenhouse Gas Emissions Savings Compared to Traditional Fuel Oil and Natural Gas

Biodiesel can achieve significant savings in greenhouse gas emissions compared to both oil-fired and natural gas-fired combustion systems. A recent study by ICF International has compared the greenhouse gas emissions of biodiesel with conventional fossil fuels and shows that B100 biodiesel can achieve an approximately 70 percent reduction in greenhouse gas emissions compared to natural gas. A modest blend with traditional heating oil will achieve greenhouse gas emission levels equal to natural gas.

B100 biodiesel has the potential to achieve considerably more greenhouse gas reductions than would be possible through conversion of oil-fired combustion systems to natural gas. Because of the favorable potential for large-scale production of biodiesel, liquid fuel-fired combustion systems offer an especially attractive pathway to a sustainable energy future. Significant greenhouse gas emissions could also be achieved by replacing natural gas-fired combustion systems with liquid fuel-fired systems that use biodiesel in high concentrations.

The Biodiesel Industry is Creating Green Jobs and Making a Positive Contribution to the Economy

Biodiesel can be made from a wide variety of feedstock materials. The fuel is produced in accordance with the D6751 fuel specification set forth by the American Society for Testing of Materials (ASTM International). Yellow grease (used cooking oil) and brown (sewer) grease, as well as animal fats, are economical feedstock materials. Several different types of plants, including soybeans, canola, and pennycress, can also provide the base oil for biodiesel production. Biodiesel offers an especially effective outlet for fat-based waste streams that can cause substantial cost for disposal.

Connecticut is already a producer of biodiesel and also has ready access to waste cooking oil and other, agriculturally-derived feed stocks via economical rail and water transportation, and could thus further expand its existing biodiesel production capacity.

Biodiesel production offers the opportunity for significant job creation in the agricultural and food industry sectors throughout the US. The economics of biodiesel can be favorable for small through large-scale, thus providing flexibility for locally-based, feedstock and fuel production.

Increasing Availability in the Marketplace

Biodiesel is a renewable, low-carbon, diesel replacement fuel that is widely accepted in the marketplace. It is the only commercial-scale Advanced Biofuel under the U.S. EPA Renewable Fuels Standard (RFS2) program. Biodiesel is one of the best-tested alternative fuels in the country and the only alternative fuel to meet all of the testing requirements of the 1990 amendments to the Clean Air Act. There are currently more than 150 biodiesel plants in the U.S. with a combined production capacity of over 3 billion gallons.

Biodiesel is primarily marketed as a blending component with conventional diesel fuel and heating oil in concentrations between two (B2) and twenty percent (B20). It is distributed utilizing the existing fuel distribution infrastructure with blending occurring both at fuel terminals and "below the rack" by fuel marketers. Certain fuel distributors have also begun to market B100 biodiesel for thermal applications in the residential, commercial and industrial sectors.

Biodiesel is Good for the Environment

Biodiesel is environmentally safe and is the most viable renewable fuel for transportation, power generation and thermal applications, based on its low carbon footprint and favorable air quality characteristics. A full life-cycle analysis performed by U.S. EPA for RFS2 shows that biodiesel reduces greenhouse gas emissions by as much as 86 percent compared to traditional fossil fuels.

Laboratory and field testing has shown that biodiesel can also help to reduce NOx emissions in power generation and thermal applications. The natural, 10-12 percent oxygen content of the biodiesel molecular structure can reduce fuel-rich pockets and peak temperatures, which are the primary culprits for NOx formation within the flame.

Transportation and Engine-driven Power Generation

Biodiesel's overall emissions from internal combustion engines are significantly lower than those of petroleum diesel. Biodiesel emissions have decreased levels of all target polycyclic aromatic hydrocarbons (PAH) and nitrited PAH compounds. These compounds have been identified as potential cancer causing agents. Biodiesel is the only alternative fuel to voluntarily perform Environmental Protection Agency (EPA) Tier I and Tier II testing to quantify emission characteristics and health effects. That study found that B20 biodiesel blends provide significant reductions in total hydrocarbons, carbon monoxide, and total particulate matter. Research also documents the fact that the ozone forming potential of the hydrocarbon emissions of pure biodiesel is nearly 50 percent less than for petroleum fuel. Biodiesel reduces sulfur dioxide emissions to virtually zero and complements Ultra Low Sulfur Diesel (ULSD) fuel as an alternative to sulfur-containing fuels.

Power Generation and Thermal Applications

Biodiesel can be easily blended with ASTM D396 heating oil (including no. 2 through no. 6 heating oils) to displace imported petroleum and improve the operational performance of the fuel. Significant laboratory research and field testing have been performed over the past 10 years to show that biodiesel blends are practical and environmentally-friendly fuels for power generation boilers as well as heating systems in residential, commercial and industrial buildings.

Brookhaven National Laboratory (BNL) has been the leading organization to study the properties and performance of biodiesel blends under wide ranges of operating conditions. BNL testing has shown that biodiesel blends of up to B20 can be used in oil-fired combustion systems without requiring modifications to tanks, burners or other components. Extensive, carefully-monitored field testing has been conducted in several geographical locations to prove the statistical reliability of biodiesel blend use in existing power plants (including at the NYPA Polletti plant) and building facilities throughout the New York City metro area.

Recent testing has shown further that B100 biodiesel can be used in boiler systems of all sizes with only limited modifications to fuel storage systems and burners. The moderate solvency effect of biodiesel has also been shown to be effective in keeping large, oil-fired combustion systems (especially air swirl vanes on no. 6 oil burners) clean and free of carbon deposits, thus contributing to reduced, smoky exhaust emissions during operation.

Biodiesel is inherently an ultra-low sulfur fuel (sulfur content under 10 ppm) and contributes to the environmental goal of reducing PM 2.5 fine particulate emissions especially in densely populated regions. Biodiesel can thus serve as a renewable component in ultra-low sulfur (ULS) heating oil, which is required in New York, and soon throughout the northeastern United States, for oil-fired combustion systems.

The Biodiesel Industry Stimulates Development of New Low Carbon Feedstocks

The feedstock used to produce U.S. biodiesel has become increasingly diversified, with waste products such as animal fat and used restaurant cooking oil (yellow grease) making up a larger portion of feedstock used to produce fuel. The National Renewable Energy Laboratory (NREL) recently conducted an extensive report on the availability of yellow and brown grease. That report concludes that 9.4 pounds of yellow grease and 13 pounds of brown grease are available on an annual, per capita basis

throughout the U.S. These figures should be used to more accurately forecast the amount of feedstock available in the Northeast and Mid-Atlantic states. NBB estimates that, nationally, these feedstocks can produce more than 900 million gallons of biodiesel. In addition, a report commissioned by the NBB addresses the use of animal fat, which has also become a major contributor of waste feedstock.

Biodiesel production is currently the most efficient way to convert sustainable biomass into low carbon diesel replacement fuel. As a result, industry demand for economical, low carbon, reliable sources of feedstock oils is stimulating promising public, private, and non-profit sector research on so-called "second generation" feedstocks such as algae. The NBB is participating in this effort by making substantial investments in algae research in collaboration with the Donald Danforth Plant Science Center. It is estimated that for every 100 million gallons of biodiesel produced from algae, 16,455 jobs will be created and $1.461 billion will be added to the national gross domestic product.

Algae's potential as a source of low carbon fuel has been well documented, and a stable, growing biodiesel end-use industry is necessary if the U.S. is to eventually benefit from the commercial scale production of algal-based biofuels. The NBB estimates that for every 100 million gallons of biodiesel produced from algae, 16,455 jobs will be created and $1.461 billion will be added to the GDP.

While soybean oil is considered a co-product rather than a waste feedstock, further discussion of this raw material is merited since farmers in several Northeast and Mid-Atlantic states produce soybeans. In 2007, approximately 39 million bushels of soybeans were grown in the states of Delaware, Maryland, New Jersey, New York, and Pennsylvania. The oil derived from this crop should be considered a sustainable, regional feedstock.

It is important to understand that demand for protein meal used as livestock feed is the primary driver for the planting of soybeans since 80 percent of a soybean is comprised of protein meal. Only 20 percent of the bean is comprised of oil. Historically, the demand for protein meal has driven soy production, resulting in a supply of soybean oil that exceeds the demand for food uses (primarily deep frying foods and baking products). The biodiesel industry helps to make economical use of this excess oil. By creating a market for this excess oil, the price of the protein meal is reduced on a proportional basis.

Biodiesel Increases Energy Security and Competition

Biodiesel is produced in geographically diverse, local facilities that are often located in close proximity to end-use markets. Production facilities are not concentrated in any particular region and are thus less vulnerable than many other types of energy resources to widespread disruption during weather disasters.

Co-products Have Important Sustainability Benefits

The co-product relationship between soybean oil and soybean meal delivers environmental benefits because no crop land and no inputs, such as water, nutrients, and energy, are used solely for the production of renewable fuel. The co-product relationship optimizes the beneficial uses from crops that will be planted anyway to satisfy demand for livestock feed and other uses. Growth in biodiesel volumes will come from more efficient utilization of existing wastes and additional vegetable oil produced as a result of yield increases on existing acres, the growing demand for livestock feed, and decreasing demand for high-trans-fat vegetable oils.

The federal RFS2 program explicitly prohibits land conversion for the purpose of producing renewable fuel. U.S. EPA requirements notwithstanding, basic economics dictate that the production of oilseed crops must correlate to the demand for protein meal, and cannot expand solely in response to demand for vegetable oil. It is impossible for oil demand alone to drive the planting of oilseed crops in North America.

Policy Recommendations

The National Biodiesel Board wishes to offer the following policy recommendations for consideration by the GC3 members:

1) Use of biodiesel for power generation – smart fuel switching and renewable energy

   Fuel diversity for electricity generation is important, especially during periods of peak load. We recommend that Connecticut implement policies to encourage early switching by power generation facilities from natural gas to renewable biodiesel during severe load periods. This will help to minimize price spikes for natural gas and thus achieve cost savings for power generation as well as for heating customers. Broad-based cost savings would be enjoyed by all ratepayers through smart fuel switching, even with the use of a fuel that might otherwise be more expensive than natural gas during low demand periods.

   The use of biodiesel to earn Renewable Energy Credits (RECs) under the Connecticut electric RPS program, as well as the reduced need for purchase of CO2 allowances under the Regional Greenhouse Gas Initiative (RGGI), would further boost the economics of smart fuel switching while contributing to your long-term energy goals.

   The use of biodiesel for power generation, whether only during peak load periods, or also for base-load purposes, could further reduce the carbon footprint of electricity in Connecticut.

2) Improved Air Quality and Public Health Relating to Oil-fired Power Generation

   We are supportive of efforts outlined in the 2015 Connecticut Integrated Resource Plan to address the need for improved air quality and public health in communities across Connecticut.

   Biodiesel can be a significant contributor to cleaner and healthier neighborhoods by helping to reduce harmful pollutant emissions from no. 6 oil-fired, power generation stations. The use of biodiesel instead of, or as a blend with, traditional no. 6 oil, would contribute to improved air quality in nearby communities by reducing emissions of SOx, NOx, PM 2.5 and toxic metals. We would therefore recommend that the CT Department of Energy and Environmental Protection consider a requirement that no. 6 fuel for power generation be blended with biodiesel in order to reduce the carbon footprint and public health impact of no. 6 oil-fired power generation.

With the advent of ultra-low sulfur (ULS) diesel fuel and heating oil use in New England, biodiesel blends with no. 2 liquid fuel can now achieve the same, clean air quality as natural gas. This means that fuel interchangeability between natural gas and biodiesel blends can be accomplished in power generation without any adverse consequences to public health. This provides an even stronger basis for the smart fuel switching and renewable power generation that we addressed in the first recommendation above.

3) Biodiesel-fired, Combined Heat and Power

Modern, clean diesel technology now achieves the same range of NOx and fine particulate emissions as natural gas-fired engines. We would therefore recommend that CT Department of Energy and Environmental Protection programs for Combined Heat and Power (CHP) place increased emphasis on the use of biodiesel as a means of improving the carbon footprint and resource diversification of CHP-based power generation in Connecticut.

We would suggest that Connecticut give consideration to additional incentives for CHP similar to those enacted recently in Massachusetts, under which customers can earn energy credits for both the electric and thermal output of their systems.

4) Development of Renewable Thermal RPS Program

We recommend that Connecticut add a renewable thermal component to its electric RPS program. The concept of a renewable thermal RPS program has been established in New Hampshire and is under implementation or consideration in several other states across the nation, including Massachusetts.

A renewable thermal RPS program would provide a parallel avenue for compliance with electric RPS requirements by obligated parties in Connecticut. This could serve to reduce the overall cost to ratepayers for the RPS program while further accelerating the transition to renewable energy in both the electricity and thermal sectors.

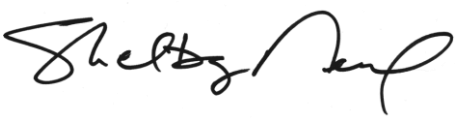
Our experience during recent winters has shown that natural gas pipeline capacity shortages can have enormous, negative consequences on all classes of electric and natural gas ratepayers. We therefore recommend that Connecticut encourage predictive, early fuel switching to biodiesel blends by interruptible, natural gas heating customers during periods of peak fuel consumption.

The National Biodiesel Board would be pleased to work with the Connecticut Department of Energy and Environmental Protection to further explore the issues that we have described above.

Conclusion

The National Biodiesel Board urges the Connecticut Department of Energy and Environmental Protection to recognize and implement a greater role for biodiesel. Biodiesel can enable Connecticut to achieve environmental sustainability while realizing the economic benefits that come from new job creation.

Sincerely,



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