National Biodiesel Board
1331 Pennsylvania Avenue
Washington, DC 20004
(202) 737-8801 *phone*

National Biodiesel Board
605 Clark Avenue
Jefferson City, MO 65110
(800) 841-5849 *phone*

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Comments Submitted to the Massachusetts Department of Energy Resources

Relating to MA Clean Peak Standard Rulemaking

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 is supportive of the Massachusetts Clean Peak Standard and would offer that biodiesel could make a significant contribution to its success.

1) We would suggest that biodiesel-fired power generation could be used in partnership with solar PV and wind power to help fill the need for renewable charging of power storage systems during unfavorable weather conditions. The use of biodiesel-fired generation during nighttime hours for battery charging could additionally help to better meet morning electric loads and thereby nearly double the overall output and economic competitiveness of battery storage systems.

2) We would suggest that combustion turbine and steam-cycle power generation systems could be upgraded to operate with biodiesel instead of natural gas or traditional oil and thereby provide for renewable power on a fully dispatchable basis during peak load periods.

3) Steady-state, rather than cycling, operation of biodiesel-fired power generation systems, with significant fuel economy and emissions benefits, could be accomplished through coordinated use for load matching during peak periods as well as for battery charging during off-peak periods. This dual use approach could help to reduce the need for inefficient, high-emissions generator start-ups.

Replies to Clean Peak Standard Stakeholder Questions

1. We would encourage MADOER to allow for the use of clean peak power systems that are connected to the transmission system rather than just to the local distribution system. We would recommend that MADOER further allow for eligibility of clean peak power systems that incorporate generation and storage facilities which are not physically co-located, but which instead are paired together under bilateral power purchase agreements.

2. We would encourage MADOER to align the geographical eligibility rules of the Clean Peak Standard with the corresponding standards of ISO New England, to include provisions for transmission of renewable power from adjacent Control Areas such as New York ISO, Quebec and New Brunswick. This would provide for simplified dispatch and accounting transactions under the umbrella of the NEPOOL GIS system. This would also allow for the transmission of renewable power from previously oil-fired generation facilities on Long Island, also in the metro NYC area, to the ISO New England grid, via the Cross Sound Cable and Northport underwater transmission connections.

7. We would recommend that stand-alone power storage systems be eligible subject to the constraint that all power used for charging be derived solely from renewable power resources. Fossil fuel use should not be allowed for the charging of power storage systems.

10. Similar to our reply to Stakeholder Question no. 7 as noted above, we would recommend that MADOER require 100% renewable charging of power storage systems, rather than adopting the federal Investment Tax Credit requirement of just 75% renewable charging. We will offer that biodiesel is fully capable of providing the necessary power generation capacity for charging of storage systems when solar PV and wind power output are not sufficient.

12. We would suggest that there not be any minimum size of the storage system compared to the capacity of the renewable generating resource from which it is drawing power during charging. We would expect that an economy-of-scale characteristic will encourage the use of significantly sized storage systems.

14. In regard to the MADOER suggested eligibility topic of fuel sourcing, we would recommend that any renewable liquid fuels used for power generation under the Clean Peak Standard be pre-qualified via certified conformance with USEPA Renewable Fuel Standard requirements. We would further recommend that renewable liquid fuels meet the applicable requirements of ASTM D396 and D6751 or other ASTM standards which might apply to power generation.

19. We would suggest that all power storage technologies be eligible for clean peak certificates without certifying that the power storage system can operate for the duration of a given peak period.

20. For the long term, we would expect that ISO New England Day Ahead and Real Time Market auctions would provide variable incentives for power storage depending on time-of-day, grid load and other operating attributes.

24. We would support the selection by MADOER of an Independent Third-Party Meter Reader for the purpose of collecting, reviewing and reporting all date to the NEPOOL GIS system. The coordinated use of solar PV, wind power and renewable fuel-fired power generation in the charging of power storage

systems will of necessity require the consistency and correct handling of all transactions that can be afforded only by a trusted, central entity.

29. Given that battery storage systems can add a significant percentage of capital cost to a renewable power project, perhaps by 50% plus or minus depending on storage capacity relative to base output capacity, we would suggest that an initial Clean Peak Standard certificate value be set at about 50% of historical RPS Alternate Compliance Payment amounts, or about $30 per MWh, to be paid in addition to other RECs earned via the existing electric RPS program.

We would also offer that the reduction in generation load during the use of power storage will enable substantially reduced real-time costs under ISO New England wholesale power auctions and that such savings may pay for a substantial portion of the certificate costs related to the Clean Peak Standard.

Biodiesel for Power Generation

Biodiesel can be easily blended with ASTM D396 heating oil (including no. 2 through no. 6 heating oils) improve the operational and environmental performance of steam-cycle power generation systems. Significant laboratory research and field testing in multiple power plant locations have been performed over the past 10 years to show that B100 and biodiesel blends are practical and environmentally-friendly fuels for power generation.

Recent testing has shown further that B100 biodiesel can be used in boiler systems via engineered conversions that incorporate cleaning, testing and necessary, site-specific hardware upgrades 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.

Laboratory and field testing has shown that biodiesel can also help to reduce NOx emissions in steam-cycle power generation. The natural 10-12% 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.

Additionally, a significant percentage of existing, gas-fired, combined-cycle power plants in the northeastern United States can also operate with liquid fuels including biodiesel. Major manufacturers of gas turbine systems, such as GE Power Systems, offer full technical and warranty support for the use of B100 and biodiesel blends in their equipment. The use of biodiesel in combined-cycle power generation offers a huge opportunity for replacing natural gas and thereby reducing greenhouse gas emissions in the power sector.

The use of biodiesel as a low carbon fuel in gas turbine power systems could also enable the continued operation of such systems in a carbon-constrained economy. This would resolve the potential problem of stranded capital assets if such power systems were to otherwise be forced into retirement due to curtailed use of fossil fuels such as natural gas.

The ability of existing natural gas-fired power plants to “stay alive”, through conversion to the use of biodiesel, in a carbon-constrained economy, would provide enormous economic benefits to the ISO New England Forward Capacity Market (FCM) auction process by offsetting much of the growth in capacity

that would otherwise be necessary for other types of renewable power facilities that have intensive, upfront capital costs.

The use of biodiesel in existing oil and gas-fired power plants, and capture of electric REC values, would likewise offer economic benefits to the ISO New England Day-Ahead and Real-time auction processes by reducing the operating cost of power plants that bid at or near the market clearing price for any given period. Such power plants will be able to reduce their bids, which in turn will directly reduce the market clearing price.

Since all power generators in the Day-Ahead auction process receive the market clearing price, rather than their individual bid amounts, for generating power, the cost savings of a reduced market clearing price would apply across the entire range of wind, solar PV, combined-cycle and steam-cycle bidders.

This would create a substantial multiplier effect in terms of the entirety of cost savings across the capacity portfolio as compared to the specific savings of power plants that operate near the market clearing price.

The bottom-line message is that operating cost reductions by the most expensive power plants can yield attractive savings to the entire rate base.

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.

Massachusetts is already a significant producer and user of biodiesel. It has good 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 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 81 percent compared to traditional heating oil and diesel fuel.

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.

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.

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.

Conclusion

The National Biodiesel Board encourages MADOER to recognize and implement a significant role for biodiesel under its Clean Peak Standard. Biodiesel can enable Massachusetts to achieve environmental sustainability while realizing the economic benefits that come from new job creation.

The National Biodiesel Board would be pleased to work with MADOER to further explore the issues that we have described above.

Sincerely,

Raymond J. Albrecht, P.E.
Technical Representative