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Clean Fuels ALLIANCE AMERICA

VIA ELECTRONIC FILING
November 9, 2020

Secretary Sonny Perdue
U.S. Department of Agriculture
Docket ID USDA-2020-0008
1400 Independence Avenue, SW
Washington, DC 20250

Dear Secretary Perdue,

The National Biodiesel Board (NBB) appreciates the opportunity to provide our comments and suggestions on the most innovative technologies and practices that can be readily deployed across U.S. agriculture. NBB is looking forward to partnering with USDA to achieve the Department's goal of increasing agricultural production by 40 percent to meet the needs of the global population in 2050 while cutting the environmental footprint of U.S. agriculture in half. Biomass-based diesel, renewable diesel, and renewable jet fuel is ready to achieve these goals with the assistance of the right incentives and market demand that the Agriculture Innovation Agenda can provide.

1. What is the innovation, how does it meet the AIA goals, and how could it demonstrate significant gains in agricultural productivity, significant reductions in U.S. agriculture's environmental footprint, or both?

The biodiesel industry is an innovation ready to meet the goals of the AIA. Biodiesel is made from an increasingly diverse mix of sources including but not limited to soybean oil, canola/rapeseed oil, inedible distillers' corn oil, distillers' sorghum oil, camelina sativa oil, and oil from winter oil seeds such as pennycress and brassica carinata.

The biodiesel industry that exists today is the result of innovation that began almost three decades ago. Farmers realized protein demand was increasing and crops such as soybeans could meet the demand. Protein meal constitutes 80 percent of every bean.[1] Soybeans produce more protein per acre than any other crop. This makes them an economic and environmentally friendly choice for satisfying protein demand for the food system. In the process of harvesting the protein demanded for the food supply, the oil harvested exceeded the capacity to consume it as food or livestock feed. As a result, an innovation was needed to utilize the excess oil. That is where biodiesel developed.

[1] American Soybean Association; Issues: Biodiesel; https://soygrowers.com/issues-pages/biodiesel/

Innovations for using the excess oils have come and gone. Partially hydrogenated soybean oil was one innovation that enabled greater vegetable oil use by changing the physical consistency of the oil so that it could be incorporated into more manufactured food items and displace saturated fats like lard, tallow, and palm oil. But health concerns related to trans fats in partially hydrogenated oils have resulted in a reversal of those markets. However, the biodiesel industry remains ready to use the surplus oil resulting from the domestic production of soy protein meal. No other single use for vegetable oil has the potential to utilize that volume of oil. And perhaps more importantly, no other use for that oil can displace imported petroleum and achieve significant GHG benefits.

Biodiesel, now more than ever, is the simple solution that is ready to meet the goals of the AIA. Only biodiesel can immediately displace petroleum diesel in the hardest to reach heavy-duty vehicles today. Biodiesel uses the same infrastructure as older diesel as well as the latest near-zero New Diesel Technologies Engines today, when CO2 emissions matter most. Currently, about 90 percent of medium and heavy-duty truck Original Equipment Manufacturers (OEMs) approve up to B20 and all OEMs approve up to B5.[2] This makes biodiesel the most environmentally friendly choice for most medium and heavy-duty fleets.

Biodiesel, while considered new and innovative as it relates to liquid fuels, it is also ready now to reduce GHG emissions. It has been shown that the using and investing in biodiesel now yields a greater net present value in addition to greater GHG reductions than waiting for a technology that is still considered immature.[3]

Biodiesel can also replace distillate fuel in other applications, including heating oil. Bioheat® Fuel, a blend of biodiesel and ultra-low-sulfur heating oil, can be blended up to 99 percent.[4] While most Bioheat® blends are 5 to 20 percent biodiesel, any blends of Bioheat® have the ability to reduce emissions that are harmful to human health and the environment, including particulate matter, sulfur oxides, nitrogen oxides, carbon monoxide, aromatic hydrocarbons, and lifecycle reduction for carbon dioxide and equivalent greenhouse gases.

Bioheat® is the only heating and energy source with an established, achievable pathway to a zero-carbon future, and many family-owned fuel retailers in the Northeast are helping that region get there faster by delivering blends of up to 20 percent or higher. At a blend of just seven percent, Bioheat® can achieve emissions reductions equal to natural gas. B20 Bioheat® is by far the cleanest and greenest heating source in widespread use today.

Oil heat is vital in regions such as the Northeastern United States where capacity for distribution of natural gas is limited. The energy density of biodiesel allows it to be delivered by truck and offloaded in a liquid form that is easily pumped into storage tanks that deliver reliable heating all season long. The Northeast heating oil industry delivers renewable liquid heating fuel to more than five million homes and businesses across the region — 80 percent of the national heating oil market. The average retail heating oil company is a multi-generation family-owned and -operated business with a median of 25 employees.

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[2] Diesel Technology Forum, https://www.dieselforum.org/policy/powering-the-u-s-economy

[3] Frank, Jenny & Brown, Tristan & Haverly, Martin & Slade, Dave & Malmsheimer, Robert. (2020). Quantifying the comparative value of carbon abatement scenarios over different investment timing scenarios.

[4] https://mybioheat.com/facts/

2. How does the innovation target one or more of the following areas?

Agricultural Productivity

Farmers are using less farmland and with fewer inputs than ever before. Today, farmers can measure and apply variable rates of seed and fertilizer down to the centimeter. They can track pH, moisture and soil conditions in real time due to precision farming. Precision farming combined with the new abilities to share best field practices, sustainable agriculture means efficient and smart use of resources.

Developments in these technologies and agricultural practices continue to improve crop yields. As just one example, U.S. soybean growers have almost doubled production since 1980 while decreasing land use, energy usage, and greenhouse gas (GHG) emissions.[5] Soybean production is able to help farmers produce more food on fewer acres with less total environmental impact. Additionally, most U.S. soy is now planted with no-tillage or other minimum-tillage conservation practices, reducing soil erosion. Reducing erosion itself is good for improving water quality and reducing phosphorous, and other nutrients that bind with the soil and can cause algal blooms.

Soybeans also produce more food, and specifically more protein, per acre than grass or any other crop. As a result, the growing trends toward optimizing production per acre of land and changing consumer demand for more poultry and pork, for which soy protein provides optimum nutritional value, are simultaneously driving farmers to plant more soy. The impact of these trends to increase protein production per acre results in a net reduction in managed agricultural land.

Similarly, U.S. corn yields have grown dramatically over the past 20 years. Yields of both of these crops and others are poised to grow further thanks to continued technological developments, such as products and new crop strains that offer enhanced disease protection, drought resistance, and resistance to insects.

Food Loss and Waste

Biodiesel, a key source of demand for soybean oil, also provides support to U.S. farmers. Because biodiesel feedstocks are a byproduct of the protein meal portion of crops used for food, the production of biodiesel lowers input prices for food production by increasing value for surplus oils and fats. By creating value for the excess oil, biodiesel helps reduce the cost of protein for consumers and helps farmers satisfy protein demand while using less land area and inputs than might be required to grow alternative protein sources. Without biodiesel, another large-scale use would be necessary to consume the excess oil.

From a global perspective, as population and standards of living continue to rise, increasing protein demand will result in an increasing surplus of soybean oil and other byproducts of protein production, such as animal fats. As a result of an increase in protein demand, the output of animal fats is principally determined by the level of animal slaughter. As the global consumption of beef, pork and poultry has expanded, the production of animal fats has also grown. Animal fat has become a valuable substitute for vegetable oils in several ways. Traditionally, it was used extensively for fatty acid production, but it is now an established feedstock for biodiesel production. It is important note that only inedible fats are used in biodiesel production. In the U.S., food grade edible tallow typically accounts for 13% of tallow output, leaving 87% available for biodiesel production. Despite the growing use of tallow in biodiesel,

[5] U.S. Soybean Export Council, U.S. Soybean Sustainability Assurance Protocol (2013), available at https://soygrowers.com/wp-content/uploads/2013/02/US-Sustainability-Assurance-Protocol-March-2013.pdf.

the production of animal fats is still driven by demand for meat, with the animal fat a "waste" by-product.

Carbon Sequestration and Greenhouse Gases

The biodiesel industry has long highlighted the lower GHG emissions of biodiesel production and use compared to the lifecycle emissions of petroleum. By definition, biodiesel must lower GHG emissions by at least 50 percent. When EPA compared biodiesel with petroleum-based diesel fuel, biodiesel reduced lifecycle greenhouse gases by as much as 86 percent.[6]

Biodiesel is inherently carbon neutral when made from renewable fats and oils. However, the lifecycle analysis for biodiesel production considers the fossil fuels used in the conversion and transport of biodiesel feedstocks and products. This yields a net lifecycle reduction of up to 86 percent compared to petroleum fuel. As sector-wide strategies are implemented to remove fossil fuel emissions from the electrical grid, natural gas supplies, and transportation fuel, these changes will automatically transform the biodiesel lifecycle toward 100 percent carbon neutrality. With clear policies focused on the implementation of renewable energy throughout the entire supply chain, the biodiesel industry will become carbon neutral.

The use of biodiesel will result in emissions reductions today. According to the Diesel Technology Forum, only 43 percent of U.S. commercial trucks have zero emissions diesel technology (engines equipped with selective catalytic reduction and particulate control technologies), leaving upwards of 57 percent of on-road engines without the significant emissions reductions' controls.

Biodiesel reduces harmful tailpipe emissions that have an adverse impact on populations living in congested areas or traffic corridors and those areas affected by drifting pollution levels. Overall, biodiesel reduces criteria air pollutants, producing a direct benefit to human health. This includes reducing unburned hydrocarbons by 67 percent, reducing carbon monoxide by 48 percent, reducing polycyclic aromatic hydrocarbons by 80 percent, reducing nitrated PAHs by 90 percent, and reducing ozone potential of speciated hydrocarbons by 50 percent.[7] EPA finds that B20 can reduce particulate matter ($PM_{2.5}$) by 10.1 percent. More recent engine testing at the University of California Riverside for the California Air Resources Board (CARB) found even greater $PM_{2.5}$ reductions of six percent for B5 and 10-15 percent for B10.[8]

Furthermore, while there is limited data on emissions in nonroad engines using biodiesel, there are known benefits. Because nonroad engines typically do not utilize diesel particulate filters (DPF) or any other advanced emission control devices, greater emissions benefits can be obtained by using biodiesel at any blend level, due to the emissions profile of biodiesel. In addition to reducing lifecycle greenhouse gases, biodiesel lowers diesel particulate matter by 47 percent; reduces hydrocarbon emissions by 67 percent; and in so doing reduces smog and ozone formation for healthier air.

If federal policy properly incentivizes the use of existing feedstocks and existing installed production capacity, the U.S. biodiesel industry is poised to achieve more than 35 million tons of annual GHG reductions by 2022.

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[6] A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions; US Environmental Protection Agency; 2002; http://www.epa.gov/otaq/models/analysis/biodsl/p02001.pdf

[7] United States. (2002). A comprehensive analysis of biodiesel impacts on exhaust emissions.

[8] Durbin, & Karavalakis, et al. (2014). Study of the Emissions Impacts of B5-B10 Blends for California.

Water Quality
Soy, the most used feedstock for biodiesel production, is among agriculture's most sustainable success stories, protecting water quality with production practices that require less irrigation, tilling of the soil and less application of synthetic fertilizer.[9] This means less nitrogen and phosphate runoff, resulting in fewer nutrients in the water that cause algal blooms, eutrophication, hypoxia, and dead zones.

Renewable Energy
The biodiesel industry can help meet the goals of the AIA set forth for renewable energy. We expect that use of biodiesel will exceed six billion gallons by 2030. Additionally, with advancements in agriculture productivity, use could reach 15 billion gallons by 2050.

The benefit of biodiesel is that the predominate feedstock is made from surplus and waste oils. As discussed above as it relates to agricultural productivity, soybeans produce more food, and specifically more protein, per acre than grass or any other crop. As demand for protein grows so will the subsequent surplus oil, the renewable energy feedstock for biodiesel.

However, to increase competitiveness, the biodiesel industry must overcome the petroleum market that is inaccessible to small and modest size companies. If the economic benefit of reducing emissions was factored into that marketplace, the biodiesel industry could displace significantly more petroleum and create carbon reductions that would not be generated in any other fashion.

Additionally, there are several new crops in development that could increase the availability of feedstocks while delivering environmental benefits and ecosystem services. For example, several varieties of winter cover crops are being developed that can protect the soil and sequester nutrients during seasons when crop land is currently fallow. The incentive to harvest additional biodiesel feedstocks could generate the revenue necessary for farmers to implement these types of conservation practices.

3. How "ready to go" and adoptable is the innovation based on the following?

- **Relative Advantage.** The degree to which an innovation is seen as better than the idea, program, or product it replaces for increasing agricultural productivity or decreasing agriculture's environmental footprint, in either efficiency or effectiveness.
- **Compatibility.** How consistent the innovation is with the values, experiences, and needs of the potential adopters.
- **Complexity.** How difficult the innovation is to understand, use, or both.
- **Transferability.** The extent to which the innovation can be adopted or can be easily made adoptable.
- **Observability.** The extent to which the innovation provides tangible results.

Biodiesel is "ready to go" and adoptable. The reliability and dense energy storage capacity of liquid fuel simply cannot be replaced for many vital sectors. Diesel fuel powers the heavy-duty trucks, trains, vessels, and aircraft essential to our economy. Diesel also powers agriculture and construction equipment vital to providing human necessities. Diesel powers most equipment needed for public safety such as ambulances, firetrucks, the military, snow removal, and emergency backup for electrical

[9] National Academies of Sciences; Water Implications of Biofuels Production in the United States; 2008; https://www.nap.edu/catalog/12039/water-implications-of-biofuels-production-in-the-united-states

generation. While we expect that numerous strategies can reduce the total volume of liquid fuel consumed for transportation, we will need liquid fuel for certain purposes for at least several decades.

Biodiesel can currently be used in any diesel engine without modification and offers an easy and cost-effective way to reduce carbon emissions in existing diesel vehicles. This is especially true in nonroad engines that do not utilize diesel particulate filters (DPF) or any other advanced emission control devices. Because these engines do not have additional control measures in place, using biodiesel will result in even greater emissions benefits, due simply to the emissions profile of biodiesel.

As detailed above in the section ***Carbon Sequestration and Greenhouse Gas Emissions***, when compared to petroleum-based diesel; biodiesel reduces lifecycle greenhouse gases by as much as 85 percent; lowers diesel particulate matter by 47 percent; reduces hydrocarbon emissions by 67 percent; and in so doing reduces smog and ozone formation for healthier air.

4. If you are familiar with USDA programs, which USDA program(s) could the innovation be deployed through and how could it be reasonably integrated into that program in a way that will move the agricultural industry beyond its current state?

Higher Blends Infrastructure Incentive Program

Infrastructure support and incentives will be needed to continue to build and retrofit traditional and/or pipeline terminals to blend more biodiesel. Additionally, increased rail capabilities will also be needed to move increased volumes of biodiesel as USDA continues to support the effort to increase biofuel feedstock production and biofuel production efficiency. Additional funding through programs such as the Higher Blends Infrastructure Incentive Program are necessary to increase the availability of higher blends of biodiesel.

Biodiesel Education Program

An additional barrier that limits the expansion of availability of biofuels to consumers is education and awareness. We ask that USDA ask Congress to appropriate funding for the Biodiesel Education Program. When funded, the Biodiesel Education Program has proved to expand awareness and markets for domestic biodiesel by educating government and private sector entities and the public about the benefits of biodiesel, which in turn stimulates biodiesel consumption and biodiesel feedstock demand. The Biodiesel Education Program focuses on educational programs that support advances in infrastructure, technology transfer, fuel quality, fuel safety and increasing feedstock production.

Over the last five years the Biodiesel Education Program received funding, the National Biodiesel Board has leveraged $3.6 million dollars from the program into an additional $17 million dollars and used it to promote biodiesel's sustainability attributes, provide technical assistance to original equipment manufacturers (OEMs) and more. From 2002 to 2018, the Biodiesel Education Program received mandatory funding via the Farm Bill. The Agriculture and Nutrition Act of 2018 provided authorization subject to annual appropriations. Congress did not provide funding for the Biodiesel Education Program in FY2020, and no funding is anticipated for FY2021.

Advanced Biofuel Payment Program

USDA's Rural Development Agency made $7 million available for FY 2021 through the Advanced Biofuel Payment Program. Previously, funds available for advanced biofuel producers, including biodiesel, was upwards of $14 million. Making additional funds available to support and incentivize biodiesel production would increase the use of biodiesel while achieving the goals of the AIA.

5. How could USDA support the deployment and adoption of the innovation in the field and what barriers to adoption do you think USDA can help overcome?

EPA continues to delay the publication of the proposed RFS RVO. Advocating on behalf of the biodiesel industry to EPA for publication and continued growth of biomass-based diesel and advanced biofuels under the Renewable Fuel Standard will send the proper signals to the industry to continue investments to grow. Confirming to EPA that the feedstocks are available for future growth will help the industry reach its potential and not be flatlined by EPA.

USDA can also advance the positive impact of biofuels in rural America through continuation and increasing investment in oilseed research through flagship research programs such as the Agriculture and Food Research Initiative (AFRI). USDA should prioritize foundational as well as applied research programs to advance regional oilseed opportunities, biotechnology solutions for increased lipid productivity, and conservation practices which will further decrease carbon intensity scores for biofuels such as biodiesel and renewable diesel. Significant dollars have historically been invested in cellulosic feedstock sources intended for biofuels production. Lipids require similar levels of investment and have the benefit of supplying the globe with needed protein in addition to a source of feedstock to help decarbonize our environment.

As the focus on carbon intensifies, USDA should also play an increased role in helping identify how rural America, and farmers specifically, can monetize their role in reducing carbon emissions. Biodiesel has been a key success story in low carbon fuel programs such as those in California and Oregon. In fact, biodiesel and renewable diesel have contributed nearly half of the carbon reductions in those programs. The need for feedstock supplies will continue to increase as similar programs are considered in other regions of the US. USDA should be a constructive voice to ensure current data is utilized and carbon modeling accurately reflects sustainable management practices already employed by US agriculture. In addition, market programs considered which would incentivize the adoption of carbon reducing agronomic practices much be implemented in a way that is practical for the agricultural community. USDA's active participation is needed as carbon programs are discussed and implemented across the US.

6. Are there specific ways that USDA programs are inadvertently hindering adoption of innovative technologies and, if so, how can USDA alleviate those barriers?

USDA is supporting biodiesel by including it in the Higher Blends Infrastructure Incentive Program (HBIIP). The investment in biodiesel is greatly appreciated but it is limited in both funds and actions as the majority of the program is focused on supporting ethanol. Under HBIIP, USDA limited biodiesel to $14 million of the $100 million available. However, the RFS as administered by EPA does not provide enough incentive to spur the infrastructure needed for biodiesel to reach currently underserved markets. Any additional funding that can support biodiesel infrastructure in future years of the program would have a strong return on investment in supporting the goals of the AIA.

The Biodiesel Education Program is currently not funded. Without consumer education and awareness of the benefits of biodiesel, adoption of this technology that is ready to be adopted will not be supported. When the Biodiesel Education Program was funded it expanded awareness and markets for domestic biodiesel demand by educating government and private sector entities and the public about the benefits of biodiesel which in turn stimulates biodiesel consumption and development of biodiesel infrastructure. If USDA were to include an education component in existing programs, the goals of the

Biodiesel Education Program support advances in infrastructure, technology transfer, fuel quality, fuel safety and increasing feedstock production will still be able to be met.

7. If you are presently working with USDA on this innovation, how is USDA already supporting its deployment and adoption?

USDA is supporting biodiesel growth by including it in the Higher Blends Infrastructure Incentive Program (HBIIP). The cost-sharing grants USDA has announced will help the biodiesel industry bring consumers the better, cleaner transportation and heating fuels they are looking for.

The National Biodiesel Board looks forward to working with USDA. We are confident that biodiesel is ready now to meet the goals of the Agriculture Innovation Agenda.

Sincerely,

Kurt Kovarik
Vice President, Federal Affairs
National Biodiesel Board (NBB)