Alliance OF AUTOMOBILE MANUFACTURERS

December 5, 2006

Robert Okamoto
Industrial Section
Air Resources Board
P.O. Box 2815
Sacramento, California 95814
Submitted via email: rokamoto@arb.ca.gov

Re: Revised ARB Draft Advisory on Biodiesel Use

Dear Mr. Okamoto:

The Alliance of Automobile Manufacturers (Alliance) appreciates this opportunity to comment on ARB's revised draft advisory on biodiesel use, published on November 14, 2006. The draft Advisory helpfully brings together existing biodiesel requirements into one document and provides some important guidance on use. We think it could go further in specifying, or at least recommending, steps to help ensure good biodiesel quality in the marketplace.

Introduction

The automotive industry has been working for decades to develop and produce vehicles that operate on renewable fuels, including biodiesel, and has put over nine million vehicles on the road across the U.S. capable of running on alternative fuels. Manufacturers are continuing to produce and develop vehicles that can operate on compressed natural gas, hydrogen, fuel cells, electricity or as hybrids, to help the country diversify its transportation energy sources.

California currently has about 630,000 of these alternatives, of which almost 350,000 are diesel-powered. Most vehicle manufacturers approve the use of up to five percent biodiesel blends in the current diesel vehicle population, and some manufacturers offer limited production of vehicles designed to operate on blends of up to twenty percent biodiesel. The industry is looking forward to being able to sell the cleanest, most advanced diesel technologies to California consumers in the future, which will help expand the market for biodiesel.

The vehicles designed to operate on renewable fuels must meet the same strict emissions and performance requirements as conventionally fueled vehicles. Since vehicles and fuels form an integrated system, ARB has a responsibility to ensure that the fuels subject to this advisory have a level of quality sufficient to ensure proper vehicle operation. Specifically, the subject fuels must allow the vehicle's complex systems to meet or exceed regulatory requirements (e.g., LEV 2) and consumer expectations (e.g., for driveability and overall performance). Poor and/or widely varying fuel quality will adversely impact vehicle driveability, performance and the ability to meet stringent emissions levels. In extreme cases, poor fuel quality could result in permanent vehicle/engine damage. This is true for any fuel, whether petroleum-based or renewable. We appreciate that ARB recognizes this fact, as shown by the state's current fuel quality, which is among the best in the world.

Alliance Supports ARB's Next Steps

For the fuel at issue here—biodiesel—voluntary ASTM standards have been improving but remain weak. Failure to adequately control biodiesel quality could very well lead to excessive vehicle emissions as well as impair long term consumer acceptance of these new fuels and vehicles. Thus, we support ARB's plan to conduct additional research to assess biodiesel's emission impacts and the effects of different test protocols. We also agree that ARB should evaluate the need for fuel specifications to preserve emission benefits and to address other issues, which we expect will include vehicle performance.

Quality Control for Biodiesel as Produced

Biodiesel quality can degrade over time and can alter important fuel properties, so B100 and biodiesel blends require additional quality control than conventional diesel fuel. The concern increases as the amount of biodiesel content increases. For example, a blend of 20% biodiesel is not expected to have the same characteristics as a diesel fuel compliant with ASTM D975. This is one reason the Alliance is uncomfortable with the current definition of diesel fuel, which allows up to B49 to be considered as diesel fuel. We hope the ARB will revisit this definition.

Fortunately, finished diesel fuel with 5% or less biodiesel content is likely to be able to meet the D975 specifications. Recognizing the public's interest in building a biodiesel energy supply, many manufacturers currently allow up to 5% biodiesel content to be used in currently available diesel powered vehicles as long as the finished fuel meets the ASTM D975 standard. Implicit in this allowance is the expectation that producers and blenders will apply good process management, use appropriate seasonal blends and follow high-level storage and handling practices. When these standards and conditions are met, limited experience with B5 suggests the fuel can be successfully used without affecting vehicle fuel or emission control systems. Still, manufacturers monitor the market closely for any problems, even at this low level.

The experience with higher concentrations, however, has been less even. Several published studies on the use of B20 on older, controlled fleets cite problems with fuel quality or/and vehicle compatibility. These problems included fuel degradation, fuel instability and materials incompatibility (e.g., seals, fuel system coatings and hoses). Not all diesel engines and vehicles on the road today are compatible with blends over B5, and most vehicles are not warranted for use with higher-level blends. Consumers are advised to check with the manufacturer for warranty coverage for specific vehicles.

The apparent disparity in reported problems at the different concentrations is likely due to differences in biofuel oxidation stability and fuel throughput rate. Vehicles parked in hot conditions for long periods of time will have more problems than fleets with continuous operation. While captive fleet operation can be monitored and controlled, personal use operation includes a wide range of duty cycles and environmental conditions. The level of protection must accommodate these different use conditions.

ASTM has been working hard in recent years to develop acceptable quality specifications for the fuel. A critical new addition to ASTM D 6751, the standard for neat biodiesel used for blending, is an oxidation stability requirement. ARB should check that the state's regulations incorporate this new requirement before it allows biodiesel use to expand. It would also help for ARB to mention this requirement in the advisory as a way to remind producers and inform the public about the need for good biodiesel oxidation stability.

The oxidation stability of biodiesel also can be improved by applying certain technologies, such as hydrotreating, during the production process. The molecules that make up biodiesel often contain

unsaturated bonds that cause much of the oxidation instability. Hydrotreating reduces the number of these unsaturated bonds, thereby improving oxidation stability. To encourage the biodiesel industry to further improve the quality, ARB should use this advisory as an opportunity to recommend that the industry use more sophisticated refining processes, such as hydrotreating, in the production of biodiesel.

Quality Control for Biodiesel as Marketed

The control of post-production biodiesel quality is almost non-existent in the U.S. and unclear in California. As noted, biodiesel has the potential to degrade during storage, particularly when stored for long periods of time or under hot conditions. This can result in a substantially different fuel than the product that left the production facility. Degraded biodiesel can cause vehicle corrosion and plugging, which materially affect fuel system function and vehicle emissions.

The experience in Minnesota last winter with 2% blends[1] and a recent NREL field fuel survey of B100 showing as much as 50% of the fuel out of spec with the ASTM D6751 limits for flash point and glycerin[2] prove the need. Despite the availability of a B100 fuel specification and the bad experience last year, companies still are failing to address the need to provide on-spec fuels. ARB has a responsibility to ensure that the biodiesel industry meets its obligation to supply the public with in-specification biodiesel and biodiesel blends, through to the retail level.

ARB should consider fuel storage life, in-use practice and other production and handling issues and use this advisory to define acceptable storage practices for B100 and biodiesel blends. The Alliance views the absence of such a discussion a significant gap in the draft document. One possible starting point is the BQ9000 program administered by the National Biodiesel Board. In the short term, ARB should require biodiesel providers to subscribe to this or a similar program. In the medium term, ARB should encourage biodiesel providers, users and other stakeholders to participate in developing an enforceable management standard and in improving that standard over time as more knowledge, experience and information become available.

Conclusion

ARB has made a good start with this draft advisory. Bringing the state's existing biodiesel requirements together in one document helps the public see the big picture for biodiesel, at least as currently regulated in California. The Alliance sees an opportunity, however, for the advisory to go further in meeting consumer and vehicle needs. Specifically, ARB should reassure the public that California has updated its D6751 standard to include the new oxidation stability requirement, recommend the industry use more sophisticated production processes such as hydrotreating to minimize any oxidation stability problem and explain better how it will address critical marketplace issues, if not address them immediately with this advisory. This will greatly enhance the state's protection of California consumers.

Sincerely,

Ellen L. Shapiro
Director of Automotive Fuels

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[1] *See, e.g.,* Associated Press, "Biodiesel Industry Gets Extension to Fix Problem," Jan. 12, 2006, available at http://wcco.com/traffic/local_story_012092953.html.

[2] Telephone communication from Steve Howell, Marc IV, on Nov. 3, 2006.