

July 8, 2015

VIA ELECTRONIC FILING

Clerk of the Board
Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: The Proposed Re-Adoption of the Low Carbon Fuel Standard

COMMENTS OF SOLAZYME, INC. ("Solazyme")

Solazyme appreciates the opportunity to comment on the California Air Resources Board's (ARB's) proposal for the 2015 Re-Adoption of the Low Carbon Fuel Standard (LCFS), and we are supportive of the LCFS. Solazyme was founded in California over 12 years ago and is based in South San Francisco. We are in commercial production and already selling biofuel to private fleets in the US, and we are eager to supply advanced biofuels for the California market.

Introduction to Solazyme

Solazyme has pioneered an industrial biotechnology platform that harnesses the prolific oil-producing ability of microalgae. Our platform is feedstock flexible and can utilize a wide variety of plant-based sugars such as sugarcane-based sucrose, corn-based dextrose, and sugar from other biomass sources including cellulosics. By growing our proprietary microalgae in the absence of light using fermentation tanks to convert photosynthetic plant sugars into oil, we are in effect utilizing "indirect photosynthesis." Solazyme develops and manufactures products for the food, skin-care, industrial chemical and lubricants, and industrial/military fuels sectors.

Solazyme is Currently Producing Advanced Biofuels

At Solazyme, we are creating clean, low carbon, renewable algae-derived advanced biofuels. The company's tailored oils are refined into cost-effective, high-quality, on-spec "drop-in" replacements for diesel and jet fuels. Solazyme's algae-derived fuels are compatible with existing infrastructure, meet industry specifications, and can be used with factory-standard engines, without modifications. The company has worked with Chevron, UOP Honeywell, and other industry leading refining partners, to produce Soladiesel_{RD}[®] renewable diesel, Soladiesel[®] renewable diesel, and Solajet[®] renewable jet fuel for both military and commercial application testing.

After extensive work with the US Department of Defense, the US Navy, United Airlines, Volkswagen, and others, Solazyme is now producing blends of its fuels for private users in the United States. In fact, we have supplied more than four million gallons for fuel blends to private fleet operators to date. This work has shown that we can supply at scale in an efficient, cost-effective way and we are looking to expand our supply base. A well-designed LCFS would help significantly in allowing us to introduce this innovative fuel to California.

Advanced Biofuel Products

- Soladiesel_{BD}[®] is a 100% algae-derived biodiesel that can be used with factory-standard diesel engines without modification. The fuel is fully compliant with the ASTM D 6751 specifications for Fatty Acid Methyl-Ester based (FAME) fuel that meets ASTM D 975, and significantly outperforms ultra-low sulfur diesel in total THC, carbon monoxide and particulate matter tailpipe emissions. Soladiesel_{BD}[®] also demonstrates better cold temperature properties than any commercially available biodiesel.
- Soladiesel_{RD}[®] is a 100% algae-derived renewable diesel fuel. It is a drop-in alternative to standard diesel fuels that meets ASTM D 975. Chemically indistinguishable from petroleum-based diesel, the fuel's tailpipe emissions also release fewer particulates and meet the new American Society for Testing and Materials (ASTM) standards for ultra-low sulfur diesel.
- Solajet[®] is a renewable aviation fuel refined from Solazyme's algal oil. It is the world's first microbially-derived jet fuel to meet key industry specifications for commercial aviation, ASTM D 1655. Solajet is compatible with existing infrastructure while offering key benefits, including a faster, farther and greater payload; reduced wing heat stress; lower flammability; lower smoke emissions; longer storage life; and ultimately, lower maintenance cost.
- Since 2008, Solazyme has partnered with the US Navy and the Department of Defense to develop, test and certify advanced drop-in renewable fuels that meet their strictest standards. Specifically, Solazyme has developed jet fuel, marine diesel and on-road diesel that have been rigorously tested by the U.S. Navy and shown to meet its HRD-76 and HRJ-5 military specifications. We are proud that Solazyme fuels were used as the reference fuels during the Navy's successful multi-year certification process for renewable marine diesel fuel.

General Comments

Provisional Pathways (pg. 91-92)

The language in Section 95488, and specifically 95488(d)(2), is greatly concerning to Solazyme because of the upfront requirements for a new pathway. The latest language has made necessary improvements, such as the removal of the 2 year monetization hold, but there are still real issues for innovative producers looking to enter the market. For instance, the proposal still requires applicants to have been in full commercial production for at least one full calendar quarter before applying for a new pathway. This timeline is not feasible for two reasons. First, biofuel refiners use or blend a broad array of feedstocks when making biodiesel or renewable diesel (e.g., cooking oil, tallow, soy oil, etc.). The dynamic nature of feedstocks processed at a facility over the course of one quarter would make it near impossible to generate consistent data for one new feedstock, even though most new feedstocks are very similar chemically and would provide very similar data.

In addition, this timeline does not match the natural course of the commercialization process for a new biofuel. It is standard practice for biofuel refiners to take time to scale up a new feedstock while it is introduced, typically by running small batches over time. That means that the refiners

will not generate a quarter's worth of consistent data on the new feedstock during its early adoption. This requirement will therefore significantly delay the opportunity for a new pathway and delay advanced biofuels from being introduced into California. It creates an undue administrative burden on the refiners to test and qualify new feedstocks. This will greatly reduce their enthusiasm to incorporate new feedstocks and unfairly drives down the value of these new feedstocks. Instead, this requirement rewards incumbents.

Furthermore, as new feedstock producers enter the California market, this will create a proliferation of pathways for ARB staff to handle. Most feedstock providers will partner with numerous refiners to produce the end product: biodiesel or renewable diesel. This means there will be a two year process for each refiner, as well as a new pathway application for each refiner, for the ARB to review.

California and the ARB have typically lead adoption for new technologies, and we hope this legacy continues, particularly at a time when so many technologies are poised to enter the market.

Batch Processing in 2016 (pg. 58)

Solazyme would also like clarification on the process outlined in Section 95488(a)(3). We understand that there are a large number of existing pathways to recertify and we support efforts to expedite this process. That said, the current language seems to indicate that each fuel type would get recertified at different times. This does not provide a level playing field for the various fuel types and all those who have worked hard to participate in the LCFS. By applying new numbers to fuel types at different times, the ARB would inherently give an advantage to the groups that are recertified first. Instead, the new numbers should be applied at the same time.

Conclusion

Solazyme understands that lack of verification for CI data for already approved pathways is an important concern. We appreciate the revisions made in the June 4 draft rule to remove the 2 year monetization hold and reinforce the authority of the ARB Executive Officer to, instead, enforce CI verification compliance. This is a much fairer approach than upfront requirements that would punish new producers. There is still work to be done, however, in ensuring that the additional upfront requirements to establish a pathway do not significantly delay (or halt) the entry of advanced biofuels to the California market.

Comments by Solazyme, Inc.

We appreciate having this opportunity to provide comments. Please contact me if you have any questions or require additional information.

Sincerely,

A handwritten signature in blue ink, appearing to be "P.P." followed by a stylized name.

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