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October 13, 2014

Katrina Sideco
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Request for feedback on Low Carbon Fuel Standard Re-Adoption - Fuel Availability

Dear Ms. Sideco:

In response to the recent public workshop to discuss low-carbon-intensity fuel availability, I am writing to alert you to the potential of microalgae-derived biomass to contribute to future energy resources in the state of California.

With a warm, sunny climate and abundant land, California is an ideal area to produce algal biomass—a renewable and rapidly growing feedstock. In fact, in the state of California alone, roughly 300 facilities grow algae in ponds used for wastewater treatment. Such ponds can remove nutrients such as nitrogen and phosphorus at a very low energy cost: 0.4 - 1.4 megawatt hours per million gallons of wastewater treated (MWh/MG) compared with 2.8 - 4.0 MWh/MG used in conventional plants. Nutrient removal by algae is particularly attractive as stringent nutrient discharge limits are adopted and aging treatment infrastructure is upgraded.

The algae biomass grown in such wastewater treatment facilities produces oils and other compounds useful for liquid fuels and power generation. A recently published peer reviewed study using the California GREET model estimated the carbon intensity of wastewater algae-derived biodiesel to be 28.5 g CO_2e/MJ*—well below the 50 g CO_2e/MJ figure indicated for soy-derived biodiesel in the public workshop held by the CEC. If 15% of total California municipal wastewater volume were directed to this end, roughly 50 million gallons of biodiesel could be produced annually. The US Department of Energy Biotechnologies Office has set a goal to produce 5 billion gallons of algal biodiesel annually by 2030.

California is uniquely positioned to expand the use of microalgae in low carbon wastewater treatment and to pioneer algae energy production. We urge consideration of this opportunity in the design of energy and climate related programs by the Air Resources Board.

Sincerely,

John Benemann
CEO, MicroBio Engineering, Inc.

*Woertz et al., (2014). Life Cycle GHG Emissions from Microalgal Biodiesel − A CA-GREET Model. Environmental Science & Technology, 6060 - 6068.