

Algae Direct Air Capture Scale-up to Multi-Acre Raceways

Global Algae Innovations

Principal Investigator – David Hazlebeck, Ph.D.

Global Algae Innovations has developed low cost algae production technologies aimed at achieving commercially viable production of biofuel and protein meal. Radical advances have been designed and implemented throughout the entire process, resulting in many industry breakthroughs for large-scale algae cultivation, harvesting and processing. As a result of these innovations, the projected cost for mature for commercial scale production of algal jet and diesel fuel is \$2.50/gallon of gasoline equivalent (GGE) facilities, so the technologies are ready to be scaled. In fact, scale-up of this process is now the major impediment to development of an algal biofuels industry.

In this project, the recently developed technology for algae cultivation solely on carbon dioxide supplied through direct-air-capture will be scaled to a 12-acre raceway with a 50,000 gallons per year biofuel intermediate production rate. With this approach, carbon dioxide is directly absorbed from the atmosphere into the open raceways so that no separate carbon dioxide concentrating or distribution system. Direct air capture of carbon dioxide is a key technology that not only reduces the cost of algae biofuel production, but greatly increases the volume of algae biofuel that can be produced by enabling algae farms to be located anywhere.

This technology will be scaled a validated through the integrated cultivation and harvesting with full media recycle in a new cultivation facility located in Shandon, CA. The advanced cultivation will be operated for 12 months to demonstrate the efficacy of the process and generate key performance parameters to validate the projected minimum fuel selling price of \$2.50/gallon with over 80% reduction in greenhouse gas emissions.

The overall project goal is to reduce the risk on cultivation and harvesting unit operations so they are ready to move to demonstration scale. Successful completion of this project will greatly reduce the risk in moving our economical, sustainable algal biofuel process to demonstration scale and accelerate the development of a commercial algae biofuels industry so that algae biofuel is a substantial contributor to the U.S. Department of Energy goal of 3 billion gallons per year of sustainable aviation fuel by 2030.