Sapphire Energy Integrated Algal Biorefinery (IABR)

Sapphire Energy Inc. will construct an IABR that will beneficially reuse carbon dioxide ($CO_{2)}$ to produce green crude oil from algae. The oil will be refined to produce jet fuel and diesel.

Sapphire Energy's Integrated Algal Biorefinery, cultivation, harvest, extraction facility (proposed for Columbus, New Mexico)

The IABR will be built in Luna Country, near Columbus, New Mexico. The algae will fix approximately 56 metric tons of CO_2 per day and produce, on average, 100 barrels of green crude oil per day, or approximately 1 million gallons per year of finished fuel product. When operating, the IABR will employ 30 workers to develop and run the facility and by 2030 more than 16,000 new 'green collar' jobs will be created. The successful project will demonstrate the technical and economic feasibility of the algae to green fuels process that will form the basis for a series of commercial-scale biorefineries. www.sapphireenergy.com/IABR

Project Description

The overall goal of the Sapphire IABR is to demonstrate that the algal oil to biofuel process scales with favorable economics. Sapphire has already demonstrated that algal oil can be refined to produce gasoline, diesel, and jet fuel. On January 7, 2009 Sapphire was part of Boeing led consortium that completed the first 2-engine 737-800 2-hour test flight using synthetic jet fuel made from algae.

Sapphire's core technology involves a process where CO_2, brackish water, and nutrients are used to cultivate and harvest oil-rich algae. The green crude oil will be refined by partner Dynamic Fuels LLC and the residual solid biomass will be anaerobically digested to produce methane for the biorefinery energy requirements and to recycle nutrients back into the production ponds.

Potential Impacts

As technology is proven at the IABR and economies of scale are achieved, the design and construction of the first commercial biorefinery will commence in 2015 and produce 150 million gallons of algal oil per year.

Other Participants

Sapphire has collaborative agreements with Dynamic Fuels, the Harris Group, AMEC/Geomatrix, Praxair, Brown and Caldwell, Sandia National Lab, and New Mexico State University.

Prime	Sapphire Energy Inc.
Location	Columbus, NM
Feedstock (s)	CO_2/Algae
Size	56 metric tons of CO_2 per day; 300 cultivated acres
Primary Products	Jet fuel and diesel
Capacity	1 million gallons per year of finished product
Award Date	TBD
GHG Reduction	60-70% reduction versus fossil product
Anticipated Job Creation	Create 750 direct and indirect jobs by 2011 and more than 16,000 by 2030; 30 full-time jobs green collar jobs created to develop and operate the facility
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