

Sapphire Energy Integrated Algal Biorefinery (IABR)

Sapphire Energy, Inc. has completed the first phase of an IABR, known as the Green Crude Farm, which will beneficially reuse carbon dioxide to produce green crude oil from algae. The oil will be refined to produce jet fuel and diesel.

The first phase of the IABR has been built, on-time and on-budget, and is now operating in Luna County, near Columbus, New Mexico. At full capacity, the algae will fix approximately 56 metric tons of carbon dioxide 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. At capacity, the IABR will employ 30 workers to develop and run the facility. The success of this project will demonstrate the technical and economic feasibility of the algae-to-fuels process for commercial-scale biorefineries. More information is available at:

<http://www.sapphireenergy.com/locations/green-crude-farm/>.

Project Description

The overall goal of the Sapphire Energy IABR is to demonstrate that the algal oil to crude oil process scales upward with favorable economics. Sapphire Energy has already demonstrated that algal oil can be refined to produce gasoline, diesel, and jet fuel. On January 7, 2009, the company was part of a Boeing-led consortium that completed the first two-engine 2.5-hour test flight for the 737-800 aircraft using synthetic jet fuel made from algae.

Sapphire Energy is at the intersection of agriculture, biotechnology, and energy. The company's core technology



Sapphire Energy's cultivation, harvest, and extraction facility is operating in Columbus, New Mexico.

involves a process where carbon dioxide, brackish water, and nutrients are used to cultivate and harvest oil-rich algae. Green crude oil is then extracted and refined into liquid transportation fuel. The residual solid biomass provides nutrients and water from the harvest process that is then recycled back into production ponds.

Potential Impacts

As Sapphire Energy continues to demonstrate their technology at the IABR and as economies of scale are achieved, the design and construction of the first commercial biorefinery will commence in 2018. At commercial-scale, Sapphire Energy expects to produce about 5,000 barrels of green crude oil per day.

Other Participants

Sapphire Energy has collaborative agreements with the following companies and organizations:

- The Linde Group
- Earthrise
- The Harris Group
- AMEC/Geomatrix
- Brown and Caldwell
- Sandia National Laboratory
- New Mexico State University.

Prime	Sapphire Energy, Inc.
Location	Columbus, New Mexico
Feedstock (s)	Carbon dioxide, algae, sunlight
Size	56 metri tons of carbon dioxide per day from 300 cultivated acres
Primary Products	Jet fuel and diesel fuel
Capacity	1 million gallons per year of finished product
Award Date	December 2009
GHG Reduction	60-70% reduction versus traditional fossil product
Anticipated Job Creation	520 direct jobs through phase one construction; 30 full-time jobs planned upon completion
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