

- \* **Commercial biofuel from algae still 7 to 10 years off**
- \* **Companies look to gene-based methods for perfect strain**
- \* **Others focus on system design to grow algae**

By Laura Isensee

SAN DIEGO, Oct 8 (Reuters) - Filling your vehicle's tank with fuel made from algae is still as much as a decade away, as the emerging industry faces a series of hurdles to find an economical way to make the biofuel commercially.

Estimates on a timeline for a commercial product, and profits, vary from two to 10 years or more.

Executives and industry players who gathered at the Algae Biomass Summit this week in San Diego said they need to push for breakthroughs along the entire chain - from identifying the best organisms to developing efficient harvesting methods.

"This is not a slam dunk. There are a lot of technologies that need to be developed," said Paul Roessler, vice president of renewable fuels and chemicals at Synthetic Genomics.

So far on the list: finding the right strain of algae among thousands of species that will produce high yields; designing systems where the desired algae can multiply and other species don't invade and disrupt the process; and extracting its oils without degrading other parts of the algae that can be made into side products and sold as well.

## **GROWING INTEREST**

Oil giants Exxon Mobil Corp ([XOM.N](#)), Chevron Corp ([CVX.N](#)) and BP Plc ([BP.L](#)), as well as investors and the U.S. military, are sinking millions into the emerging industry.

Scientists and investors are lured by the pond scum's natural oils that can be extracted and refined into fuel.

Algae grows fast and absorbs greenhouse gases along the way. Plus, the lowly lifeform uses less land, water and other resources than the corn or soybeans used in first generation biofuels, alleviating concerns that those renewable fuels would cause food shortages.

Privately held companies like Sapphire Energy and Synthetic Genomics, which linked up with Exxon Mobil, are betting on gene-based methods to develop a super bug.

"You can only go so far with classical methods of strain development," Roessler said.

Synthetic Genomics is working on cells that will directly secrete the oils and lipids that scientists want, eliminating some of the costs to harvest the algae and extract its oils.

## **OPEN VS. CLOSED**

Taking algae from carefully controlled laboratories and growing it on commercial scale is another major hurdle, and has divided the industry into two camps: open ponds versus enclosed containers called bioreactors.

Martek Biosciences Corp ([MATK.O](#)), which in August struck a development deal with BP, is eyeing a third solution to mass-produce algae's "green crude": fermenters that are 12 feet (3.7 meters) in diameter and five stories tall.

Ponds and bioreactors are still immature technologies, said Martek's Bill Barclay, who spent 11 years developing nutritional supplements from algae.

"We need to have the learnings along the way. We need to focus on more intermediate technology development," Barclay said at the summit.

Valero Energy Corp-backed ([VLO.N](#)) Solix Biofuels is striking a hybrid approach on the system front. The company recently finished the first part of its plant in Colorado, where it put flat panels in open basins to pump in carbon dioxide from a nearby natural gas refinery. [ID:N07499114]

Even as Solix Biofuels focuses on infrastructure, the company's technology officer Joel Butler said that the industry needs help from all sides to cash in on algae's promise.

"It's going to take the right engineering solution with the right species to make it commercially viable," Butler said.

## **HELPING HAND**

Bill Glover, who chairs the industry group Algal Biomass Organization and directs Boeing Co's ([BA.N](#)) environmental strategy, said the industry needs to have more federal support so that algae has the same incentives that other biofuel feedstocks, like corn, enjoy.

"It's never going to get off the ground without a helping hand," Glover said.

Glover said his best estimate for a commercial timeline is seven to 10 years. (Reporting by Laura Isensee, editing by Marguerita Choy)