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Green crude made from algae

BY ALOK JHA

A liquid fuel made from plants that is chemically identical to crude oil but which does not lead to climatic change when it is burned or, unlike other bio-fuels, need agricultural land to produce sounds too good to be true. But a company in San Diego claims to have developed exactly that – a sustainable version of oil it calls “green crude.”

Sapphire Energy uses single-celled organisms such as algae to produce a chemical mixture from which it is possible to extract fuels for cars or planes. When it is burned, the carbon dioxide is absorbed by the algae during its growth, making the whole process carbon neutral.

Major investors are already opening their cheque books, Sapphire has raised a total of \$ 50m in venture capital in recent weeks, the highest amount ever for an algae biotech company, including a significant investment from the UK's Wellcome Trust.

Algae are seen by many experts as promising a source of green fuel in the future. Yusuf Chisti at Massey University in New Zealand estimates that algae could produce almost 100,000 litres of bio-diesel a year per hectare of land, compared to 6,000 litres a hectare for oil palm.

The money for Sapphire came flooding in after the company recently reached its most significant milestone

yet, refining high-octane gasoline from their green crude. “The resulting gasoline is completely compatible with current infrastructure, meaning absolutely no change to consumer's cars,” said a Sapphire spokesperson.

An added advantage is that their gasoline does not have contaminants like sulphur, nitrogen and benzene, and the cost of their fuels will also be comparable to standard fossil fuels in the market.

Many bio-tech companies around the world are working on using algae to produce ethanol or bio-diesel that could replace traditional transport fuels, such as displacing food crops. “The process uses non-arable land and non-potable water and delivers 10 to 100 times more energy per acre than cropland biofuels,” A Sapphire spokesperson said.

Sapphire is probably using genetically-modified cyanobacteria, which used to be called blue-green algae. These organisms can grow quickly (some

blooms can double their mass in just an hour), operate in high temperatures and some strains can even fix nitrogen from the air to make their own fertilisers. The next step is dependent on developing the engineering and cultivation systems to grow the algae economically, Skill said.

Skill said that Sapphire would need advances in technology called photobioreactors to make a successful leap to commercial production.

Also crucial to making the green crude commercially viable is to use the by-products other than oil from the algae. “You can probably derive 40 per cent of the algae's weight in oil and you have got 60 per cent of other stuff and there is a lot of valuable components in that in terms of chemical feed stocks.”

Sapphire said it expects to be at a stage of commercial production of green crude within three to five years. Geoffrey Love, head of venture capital at the Wellcome Trust, said the investment was made with this in mind.

He added that the bio-medical charity had its own scientific diligence work done before making the investment and that the backing of another investment group that Trust often worked with, Arch Ventures, swung their own decision.

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