Fueling the future

Biodiesel fuel processing plant takes shape in Port of Stockton

By Reed Fujii
Record Staff Writer

STOCKTON — The recent opening of a 60 million-gallon-per-year ethanol plant at the Port of Stockton drew a crowd of hundreds, including state and local politicians.

Much more quietly, Community Fuels began making biodiesel in November at its first production facility in another part of the port.

Volume is slowly being ramped up, Community Fuels' Chief Executive Lisa Mortensen said.

The company hoped to process two railcars of vegetable oil, about 50,000 gallons, during this past week and aims to hit its full capacity of 10 million gallons per year by the end of March.

"For us, it's just a matter of having the available feedstock," Mortenson said. However, the record highs and the sudden plunge in commodity markets in recent months have given the company pause.

Soybean oil, a primary feedstock, reached nearly 70 cents a gallon in the summer and is currently less than 30 cents a gallon. Crude oil, which drives the prices of diesel fuel, has gone from nearly $147 a barrel in July to less than $50 a barrel.

"It is challenging," she said.

It does appear commodity markets may be stabilizing just as Community Fuels begins operations.

"We're at the end, we hope, of that commodity market drop," Mortenson said.

The privately held company, based in Encinitas, doesn't disclose its operating margins, what it cost to build the Stockton plant or operational details.

However, Mortenson said the new facility can turn an operating profit and cited several factors in its favor:

- Community Fuels can use vegetable oil — either virgin stock or recycled restaurant cooking oil — or animal fats in different blends.

"That gives us a lot more flexibility," she said.

- Improving production efficiency and being able to sell a high-quality glycerin — a byproduct of making biodiesel — also contribute to the bottom line.
- Its customers are nearby, all existing Northern California petroleum distributors.
- And the Port of Stockton location, with good access by rail and truck, and potentially ocean transport, can help the company tap a variety of material sources.

Mortenson offered an ambitious plan. Much of the Stockton facility was built to handle a volume of 20 million gallons of biodiesel per year.

It would take the addition of some tanks, piping and processing equipment, but the chief executive said, "I would like to go to 20 million gallons per year within the next 12 months."

Eventually, she said, the existing site could accommodate a facility churning out 80 million gallons per year, well in excess of the celebrated Pacific Ethanol Inc. plant nearby.

A key driver would be demand. California consumed more than 3 billion gallons of diesel in 2007, state officials report. And the state's proposed low-carbon fuel standard — which could require carbon emissions be reduced to 1990 levels by 2020 — could boost demand for biodiesel in particular.

"Biodiesel represents an immediate and practical solution toward meeting that low-carbon fuel standard," Mortenson said.

That needs to be proved, said Dimitri Stanich, a spokesman for the California Air Resources Board. Low-carbon standards must consider all aspects of producing a fuel, from how it's produced to what materials are used to make it and how they are produced, as well as transportation and delivery of all materials involved.

"Biofuels do look promising, but we need to make sure we don't run into this and have some negative effects that swamp the positive gains that we make," Stanich said.

If the plant consumes primarily virgin vegetable oil as a raw material, that is not sustainable in the long term, agreed John Brock, an environmental engineer with the U.S. Environmental Protection Agency in San Francisco.

However, biodiesel does provide immediate clean air benefits, he said.

"We have such a serious problem in California with exposure to diesel exhaust. Any biodiesel that is burned in place of diesel is going to greatly reduce the amount of toxic particulates emitted from those engines," Brock said.

Tapping recycled cooking grease from restaurants as a resource could be one step toward a more sustainable product, EPA officials said.

Olof Hansen, an environmental specialist with the San Francisco EPA, noted that Santa Cruz has partnered with its local restaurant association to collect used cooking oil and convert it to biodiesel that is used to power municipal vehicles.

Mortenson said Community Fuels wants to go a step further. It is exploring use of oil-producing algae — feeding on agricultural and food-processing wastes — that can be converted to fuel.

"The future in biodiesel feedstock is algae," she said.

The company has already proved the concept in the lab, Mortenson said. Community Fuels is seeking support to run a larger scale pilot test that could lead to a practical production-scale project.

"My strong preference is that project be commercially demonstrated right here in Stockton," she said.

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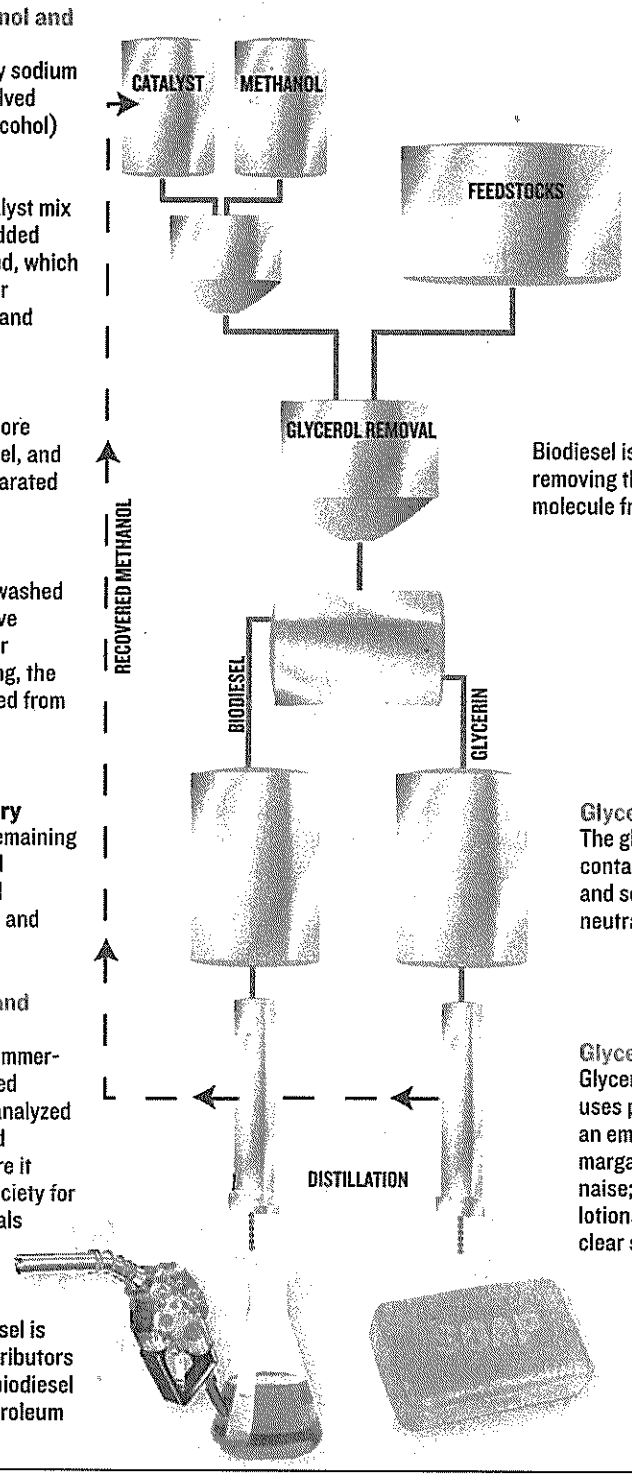
How biodiesel is made



Mixing of methanol and catalyst
A catalyst, typically sodium hydroxide, is dissolved methanol (wood alcohol)

Reaction
The methanol/catalyst mix and oil or fat are added together and heated, which results in two major products; glycerin and biodiesel.

Settling
Glycerin is much more dense than biodiesel, and the two can be separated by gravity.

Wash
Biodiesel must be washed with water to remove contaminants. After washing and settling, the water can be drained from the bottom of the container.

Mehtanol recovery
Excess methanol remaining in the biodiesel and glycerin is removed through distillation and recycled for reuse.

Product quality and registration
Prior to use as a commercial fuel, the finished biodiesel must be analyzed using sophisticated equipment to ensure it meets American Society for Testing and Materials specifications.

Final product
The finished biodiesel is shipped to fuel distributors to be sold as pure biodiesel or blended with petroleum diesel.

Feedstocks
Biodiesel is produced from vegetable oil or animal fat.

Biodiesel is formed by removing the glycerol molecule from the oil.

Glycerin neutralization
The glycerin byproduct contains unused catalyst and soaps that are neutralized with an acid.

Glycerin uses
Glycerin has numerous uses preserving food; as an emulsifier in butter, margarin and mayonnaise; as a base for lotions; and making clear soaps.

Sources: National Biodiesel Board; Iowa Renewable Fuels Association; Western Iowa Energy

K. FIRTH/The Record

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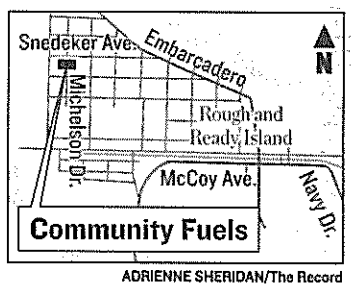
Lisa Mortenson, CEO of Community Fuels, and Bruce Cohen, plant manager, during a tour of the company's facility.

Lisa Mortenson, CEO of Community Fuels, holds a vial of biofuel during a tour of her company's facility in Stockton.

Biodiesel production

Community Fuels began making biodiesel at its first production facility, located in the Port of Stockton.



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