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A New Test for Business and Biofuel



Eric Draper for The New York Times

Algae produced at the Solix Biofuels plant, a start-up with unusual business partners.

By KIRK JOHNSON
Published: August 16, 2009

IGNACIO, Colo. — An unusual experiment featuring equal parts science, environmental optimism and Native American capitalist ambition is unfolding here on the [Southern Ute Indian Reservation](#) in southwest Colorado.

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Eric Draper for The New York Times

The Solix Biofuels plant on the Southern Ute Indian Reservation in southwest Colorado. The area averages 300 sunny days a year.

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With the twin goals of making fuel from algae and reducing emissions of heat-trapping gases, a start-up company co-founded by a [Colorado State University](#) professor recently introduced a strain of algae that loves carbon dioxide into a water tank next to a [natural gas](#) processing plant. The water is already green-tinged with life.

The Southern Utes, one of the nation's wealthiest American Indian communities thanks to its energy and real-estate investments, is a major investor in the professor's company. It hopes to gain a toehold in what tribal leaders believe could be the next billion-dollar energy boom.

But from the tribe's perspective, the business model here is about more than business. "It's a marriage of an older way of thinking into a modern time," said the tribe's chairman, Matthew J. Box, referring to the interplay of environmental consciousness and investment opportunity around algae.

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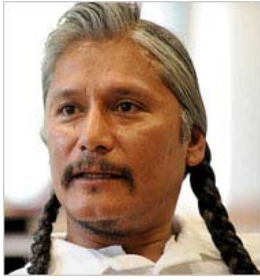
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Eric Draper for The New York Times

"It's a marriage of an older way of thinking into a modern time," said Matthew J. Box, the chairman of the Southern Utes.

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The tribe, whose reservation sits atop one of the world's richest fields of natural gas from coal-bed methane, had to surmount many hurdles to find an alternative energy idea it considered suitable.

For example, any project that would displace land used for growing food was tossed out for philosophical reasons: the Southern Utes' belief that energy and food should not compete in a world where people still starve. That eliminated discussion of corn-based ethanol.

And whatever was chosen had to be at least technically feasible, if not immediately profitable.

The 1,400-member tribe also has a long history of herbal medicine use that made growing algae for fuel appealing, Mr. Box said. "It reminded people of herbs that are helpful here, like bear root, which is harvested in the mountains," he said.

The Colorado State professor, Bryan Willson, who teaches mechanical engineering and is a co-founder of the three-year-old company [Solix Biofuels](#), said working with the Southern Utes on their land afforded his company advantages that would have been impossible in mainstream corporate America. The tribe contributed almost one-third of the \$20 million in capital raised by Solix, free use of land and more than \$1 million in equipment.

"If you're going with strict venture capital, they're looking for a blistering return on capital in three to five years," Dr. Willson said. "The Utes have a very long economic view. They're making decisions now for future generations as opposed to the next quarter, and that is just fundamentally different."

But the tale of any start-up is written between the margins of inspiration and hard-edged reality.

More than 200 other companies are also trying to find a cost-effective, scalable way to achieve the same end — turning algae into vegetable oil fuel, according to the [National Renewable Energy Laboratory](#), a federal research center in Golden, Colo. Just last month, Exxon said it planned to throw \$600 million into its own algae project, dwarfing Solix's financial base about fiftyfold. Like most oil-to-fuel efforts, the Solix project focuses on making [biodiesel](#), which can be used in a regular diesel engine.

"This is still a very young industry, with a lot of claims out there that are sometimes difficult to believe," said Al Darzins, a group manager at the lab's [National Bioenergy Center](#).

Mr. Darzins said Solix's model was different from most: the algae is grown in closed bags, lined up vertically in the water tanks, with the intent of increasing yield. But for every hopeful, he said, the crux will be controlling costs.

"Solix has an interesting idea; whether it will work, I don't know," Mr. Darzins said. "It's all going to come down to the economics."

Solix's facility project is next to the natural gas processing plant for access to the carbon dioxide waste stream, which will be used to nourish the algae — a kind of biological recycling of carbon dioxide before its discharge into the atmosphere as the vegetable fuel

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The plant also produces waste heat, which could be used to warm the algae beds in winter. In addition, the high desert plateau of southwest Colorado is one of the sunniest spots in the nation, providing solar radiation that accelerates algae growth.

Central to Solix's business model, Dr. Willson said, is the hope that power plants and other factories now venting carbon dioxide will allow the company to build an algae farm next to their carbon dioxide vent pipes. A plant could sell the oil or biodiesel, and Solix would earn its return by being a part owner-operator, or by licensing the technology.

If Solix can expand its operations to a commercial scale, the Southern Utes will have certain first ownership and operating rights in Solix plants throughout much of the Western United States.

Karl Jacob, the director of public finance in state and local government ratings at the credit rating agency [Standard & Poor's](#), tracks Native American economics and has assigned the Southern Utes' debt a AAA rating, the agency's highest. Mr. Jacob said the tribe had proved a canny investor by doing its homework and not moving too fast.

It operates businesses in 14 states, owns office towers and land from Denver to Oceanside, Calif., and controls a company that processes about 1 percent of the nation's natural gas. But it has only about \$69 million in debt according to [S.&P.](#) Compared with most companies, that is a tiny debt-to-asset ratio.

"They have always been very prudent," Mr. Jacob said, "looking out into the next generation."

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