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Illinois Sustainable Technology Center
PRAIRIE RESEARCH INSTITUTE

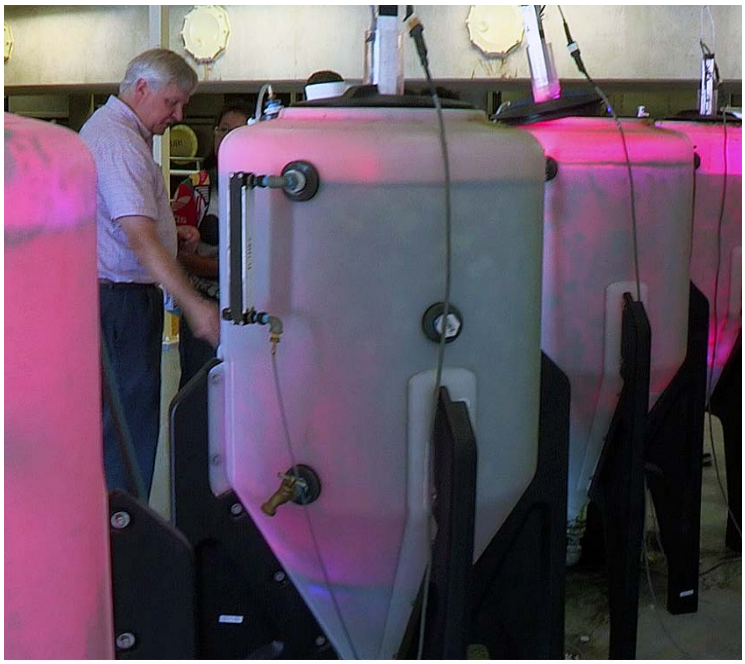
NEWS

Department of Energy backs public-private partnership to put CO_2 to work producing animal feed

CHAMPAIGN, Ill. --- Prairie Research Institute researchers are embarking on an effort to give troublesome carbon dioxide gas more of what it currently lacks -- value.

The U.S. Department of Energy (DOE) is supporting research at PRI's Illinois Sustainable Technology Center to demonstrate the feasibility of producing animal feed and/or biocrude energy at significantly lower cost than demonstrated before.

The $1.25 million research project will combine technologies for bio-energy production, developed at ISTC in collaboration with the private, commercial partner Helios-NRG headquartered in East Amherst, NY.



ISTC research scientist Lance Schideman at an algae production pilot already underway at an Illinois wastewatter treatment facility.

Generally state-of-the-art technologies that aim at beneficial use of CO_2 have proven too expensive to be commercially viable.

The cost of capturing flue gas at coal-fired power plants can be offset if it can be made an industrial commodity. This study will explore the feasibility of combining municipal waste water with the waste gas to produce algae at accelerated rates.

Algae species with the highest uptake of CO_2 and with superior nutritional content for animal feed will be grown. Helios-NRG and ISTC are also collaborating on DOE-sponsored research to develop bio-fuel production technology using algae and captured CO_2. With the help of National Science Foundation support, Helios has developed a portfolio of algae species that thrive under high CO_2 concentrations.

CO_2 Use to Produce Animal Feed

"High CO_2 concentrations and the plants' ability to use it quickly are key factors in healthy, continuous, profitable algae farming," said Lance Schideman, ISTC research scientist and principal investigator on the project. “Value is also created by using nutrients from wastewater. Normally nutrients are a cost for algae growers and a cost for treatment plants to remove them. Combining the needs of both stakeholders creates a win-win,” he added.

"To reach our goal of producing algal biomass at much lower cost than the current market price, we have to hit our projections on many contributing factors."

In addition to CO_2 feed concentration and algae growth rate, he added, those factors include algae concentration in the culture, gas residence time, mass transfer efficiency, and photobioreactor (PBR) design. While the beauty of algae production is that it captures solar energy in an easily transportable form, commercial production will be enhanced with a multistage reactor design that facilitates CO_2 availability during photosynthesis.

Removing water from the algae can be costly and energy intensive, Schideman said. The research team will also be demonstrating a forward osmosis system to separate water from the algae using very little energy.

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