



## WHO KNEW?\*

# Duke Energy-University of Kentucky East Bend Power Plant ~ Union, KY East Bend Algae Demonstration Project



Duke Energy is hosting a project at its East Bend Power Plant in Kentucky to demonstrate an algae-based system for CO<sub>2</sub> mitigation from coal power plants. Project participants include the University of Kentucky Center for Applied Energy Research and the University of Kentucky Department of Biosystems and Agriculture Engineering. The primary focus of the project is to demonstrate how to use algae to reduce CO<sub>2</sub> emissions produced by coal power plants. Additionally, the project focuses on studying the production of biofuels and other bio-products from the algae to demonstrate the economic feasibility of using algae to capture CO<sub>2</sub>.



A demonstration scale photobioreactor (PBR) is currently being operated at the East Bend Station using coal flue gas as the CO<sub>2</sub> source. The PBR converts the CO<sub>2</sub> in flue gas to algal biomass via photosynthesis. The biomass is then periodically harvested to supply feedstock for upgrading into value-added products. The low energy harvesting system recycles water and unused nutrients.

View two video clips on Algae CO<sub>2</sub> Capture:  
<https://www.duke-energy.com/environment/carbon-capture-and-storage.asp>

### **A Microalgae-Based Platform for the Beneficial Reuse of CO<sub>2</sub> Emissions from Power Plants**

In related news, in mid-August 2015, the U.S. Department of Energy's National Energy Technology

Laboratory (NETL) announced it has selected 16 projects to receive funding through its Carbon Capture Program, including two focused on algae. The program funds development and testing of transformational CO<sub>2</sub> capture systems for new and existing coal power plants.

<http://energy.gov/fe/articles/doe-selects-16-transformational-carbon-capture-technologies-projects-funding>

One of the two algae-based project awards was granted to the research team at the University of Kentucky Research Foundation, along with the University of Delaware College of Earth, Ocean, and Environment and ALGIX, LLC (Meridian, MS). The team will study microalgae-based CO<sub>2</sub> capture with conversion of the resulting algal biomass to fuels and bioplastics. *Scenedesmus acutus* algae will be cultured in an innovative cyclic-flow photobioreactor; the algae will be harvested and dewatered using a University of Kentucky technology based on flocculation (a process where fine particles clump together)/sedimentation/filtration. The project is expected to yield a conceptual design for an algae-based CO<sub>2</sub> capture system suitable for integration with a coal power plant. The project will last 24 months. DOE is contributing \$990,480 to the \$1.26 million project. BTW ~ this project is just down the road from Southern Company's Kemper County IGCC plant.

For more information on algae-related projects, please see the Algae Biomass Organization's website at <http://www.algaebiomass.org/>.

**\*A regularly featured column on industry, university and government initiatives in support of clean coal technology development & commercialization.**