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## Texas Making History with First-Ever Cellulose Biogas Plant

The USDA-Natural Resources Conservation Service (NRCS) welcomes the first cellulose biogas plant in the United States to Leon County, Texas. Groundbreaking ceremonies for the Mustang Creek Biofuel Plant were held Friday, June 5, 2009, with construction expected to be completed at the end of the year.

The plant will have the capability of producing 1 MW of electricity, enough to power approximately 400 homes year round. Houston County Utility has already contracted to buy the electricity.

The bio-energy plant will use hybrid forage sorghum, developed by MMR Genetics, for its fuel source. Processes in the plant will create biomethane, which can be sold in gas form, or can be piped to generators on site that burn the gas to produce the electricity.

“This is a landmark project for the U.S. and the ag industry,” states NRCS Texas State Conservationist Don Gohmert. “This has the potential to revitalize agriculture as millions of acres that could no longer produce profitable commodity crops, now have a new opportunity for income.”

Unlike corn, or other types of food crops grown for energy production, the hybrid forage sorghum is a type of grass, so no valuable food sources are used to generate the electricity. Additionally, the 2,400 acres of sorghum silage dedicate to this project are going to be grown on fallowed farm land, so no farm land was taken out of current crop production.

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This clean renewable energy project is the brainchild of farmers George King and Buddy Alders of the Madisonville, Texas area. They consulted with representatives from the NRCS to help get their idea off the ground.

Allen Smith, coordinator of the Post Oak Resource Conservation and Development (RC&D), a branch of the NRCS, has been working with Alders and King for over two years, helping to provide grant research, soil and plant science data and other information to help them achieve their goals of green, clean energy. Their combined research led them to Germany, where they toured biogas plants, after which they are modeling the Mustang Creek Plant.

Contrary to maize, corns, switchgrass or other energy crops, this hybrid forage sorghum requires no irrigation and less fertilizer but yields an average of 12 tons per acre.

The entire project, from farming to energy delivery, is a carbon neutral process. The greenhouse gasses emitted will be offset by their capture and all of the byproducts produced in the process will go back into the cycle or utilized offsite. The CO<sub>2</sub> that results in burning the biomethane will be captured, and along with the introduced nutrients, including poultry litter, will be used to grow algae, which will produce biodiesel. The biodiesel will then go back to the farmers that are raising the crops.

“The entire process is based on very sound soil, water and crop production practices,” says Gohmert. The farmers co-op for the sorghum plant are consulting with NRCS to apply conservation practices, such as minimum tilling their land, to keep their land healthy.

A major benefit of sorghum-based biodiesel is the fact that the sorghum plants absorb CO<sub>2</sub> from the atmosphere in the growing process. They use the sun’s solar power and turn CO<sub>2</sub> into stored energy. This effectively recycles CO<sub>2</sub> in the atmosphere because the same CO<sub>2</sub> released from biodiesel combustion is taken up in the next sorghum crop.

No water is used in the digestion production process, but because on average, silage 67 percent moisture, water is a byproduct. This water, with valuable minerals and nutrients left in the digestate, will be applied back to the land. Storm runoff water will also be captured and utilized for plant sanitation and fire prevention. There are opportunities to capture other byproducts, such as heat, and use it to heat water for hospitals, prisons and other facilities.

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Two 150 kilowatt windmills will be placed at the plant to improve the plant's efficiency and help maintain electric production.

Smith points out that with every single generation, America is losing more and more farmers.

“This project could provide a new future for farming and energy in America,” he says. “This is a crop that will actually keep the next generation of farmers on the farm.”

Within the next year, four more new plants will begin construction all in the central Texas. In the next eight years, King and Alders have plans to have 50 plants up and running throughout central Texas.

Based on the expected revenue from this first plant, an economic analysis using the Regional Industry Multiplier System, predicts an additional 137 jobs and 14 businesses will be created in the economic region from this first project.