

BIOGAS CLEANUP AT AA DAIRY FOR DOWNSTREAM ENERGY APPLICATIONS

AA Dairy, Candor, Tioga County, NY

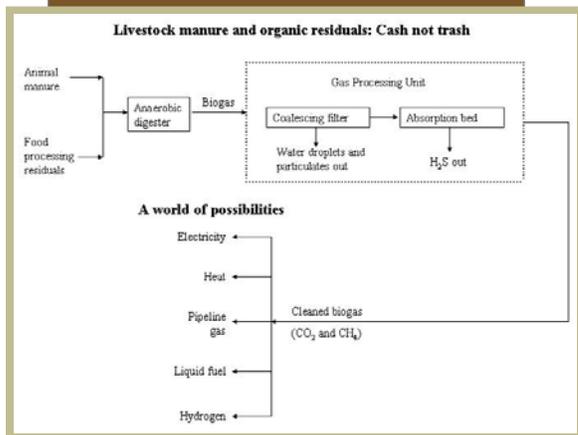
Anaerobic digestion of animal manure has successfully been demonstrated for renewable energy production. The annual potential of biogas production in the state of New York from livestock manure alone is roughly 478 million cubic feet. The addition of food processing residuals will increase this estimate substantially. Opportunities clearly abound for renewable energy production from organic residues in NY. Biogas typically consists of 55-65 % methane, 35-45 % carbon dioxide and about 0.3 % hydrogen sulfide (H_2S), which is a highly corrosive contaminant. In addition, biogas leaves the digester with a lot of particulates and is saturated with water vapor. The control of H_2S , water and particulates is desirable for good long term operation of most energy production technologies, and for some applications significant H_2S and water removal is essential.

AA Dairy, located in Candor, NY has successfully been using biogas for on-site electricity production for over seven years. In November 2005, a Gas Processing Unit (GPU) was installed to remove over 99.9995 % of H_2S along with most of the water droplets and particulates.

The GPU needs a biogas input pressure of three inches water column which is provided by a blower. The gas is first stripped of particulates and water droplets in a coalescing filter. It is then heated before it passing through two successive activated carbon beds where the H_2S is converted into elemental sulfur. The process has been optimized so that bed replacement is needed only once every six months. The configuration of dual beds allows for continuous operation even when one bed is being replaced. The bed manufacturer has been contracted to replace used beds, thereby obviating the need for the farmer to handle the sulfur. The design requires minimum operation and maintenance and has been set up to be controlled through a computer that will also monitor the incoming gas pressure, control and monitor the blower as well as monitor the exit H_2S concentration and shut the blower/GPU if the exit concentration is greater than the set point. If the GPU shuts down, biogas will automatically feed the generator as it is currently operating to produce electricity. It is expected that by summer of 2006 cleaned biogas will be demonstrated as a renewable source for producing ultra pure hydrogen.

Further Information:

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System schematic



Gas processing unit

“It is important to have a consortium of government, industry and academia to address the important renewable energy issues of today.”

- Bob Aman, AA Dairy