GEOGRAPHIC INFORMATION SYSTEM USE IN DAIRY FARM-BASED DISTRIBUTION GENERATION SYSTEMS PLANNING

Anaerobic digestion to provide fuel for combined heat and power (CHP) generation on farms began in the early 1970s. In the 1980s, new federal tax credits motivated the construction of about 120 plug-flow digesters in the United States. However, many of these systems failed because of poor design or faulty construction. In recent years, increasing awareness that anaerobic digesters can help with odor reduction and nutrient recovery has stimulated renewed interest in the technology. Dairy farmers, faced with increasing federal and state regulation on animal wastes, are looking for ways to comply. This trend was further encouraged by government support, such as the Environmental Protection Agency’s AgSTAR Program, which promotes the use of methane-recovery (biogas) technologies at concentrated animal feeding operations (CAFOs) with liquid or slurry manure systems.

As the third-largest dairy state in the nation, New York has these significant renewable resources for development in its rural areas. Renewable indigenous resources used with small-scale, modular, distributed-generation power plants can improve efficiency and reliability. However, because renewable resource availability tends to be highly site-specific, assessment studies are of limited value if they are only a numerical assessment. It is important to know how much energy potential is available and identify adequate renewable resources. A Geographic Information System (GIS) is an ideal tool to address this issue.

This study will develop a GIS model to integrate information on dairy farms in the State, as well as various environmental, social, economic and technical factors that are critical to identifying locations most suitable for considering distributed bioenergy systems. This project is expected to have several benefits, including:

- information and data to quantify the potential magnitude of using dairy manure in New York State;
- increased awareness of the benefits of using dairy manure as a renewable energy resource among policy makers, the public, energy investors, and environmental organizations;
- reduced uncertainty for farmers and energy planners involved with investment and development decisions for biomass energy projects.

Data collection and processing are underway, and it has yielded some intermediate results.