Organic Waste Source Identification & Characterization for Anaerobic Digestion

North Country Biogas, LLC (NCB) supplies, manufactures and installs anaerobic digesters in the United States. They have developed a unique anaerobic digestion process, capable of utilizing up to 100% food waste as input and producing energy, vehicle fuel and class-A bio-solid products.

Challenge

By siting an anaerobic digester in or around Madrid NY, NCB would divert organics from the landfill, reducing methane emissions while also producing renewable energy. To ensure an adequate supply of digester feedstock, NCB requested that NYSP2I apply resources under its Green Technology Accelerator Center (GTAC) to assist in identifying, quantifying and characterizing the available organic waste within 100 miles of Madrid, NY.

Solution

NYSP2I identified and mapped the sources and users of organic waste within a 100-mile radius of Madrid, NY. The organic waste generation was estimated for all identified sources and confirmed for five (5) sites. Samples were collected from several facilities to further characterize the waste in terms of chemical oxygen demand (COD), % total solids (TS), % volatile solids (VS) and pH. The biomethane potential (BMP) was then calculated for the sample showing the highest strength.

The goal of this project was to assess the feasibility of commissioning an anaerobic digestion system in the St. Lawrence region by providing North Country Biogas with a comprehensive summary of the available organic waste including quantities, composition, biomethane potential and distance from Madrid, NY.

Results

- Based on the estimated organic waste available, an anaerobic digester utilizing primarily manure as feedstock may be feasible for the study area around Madrid, NY.
- There were 198 sources of organic waste identified within the study area, producing an estimated 50,733 tons/week of organic waste.
  - 50,060 tons/week of manure (estimate)
  - 673 tons/week of food waste (estimate)
- Over 99% of the total estimated organic waste was found to be generated by the twenty six (26) food processors and ninety six (96) concentrated animal feeding operations (CAFOs) identified.
- North Country Biogas forecasts the creation of 6 new jobs over a 3 year period resulting from the installation of an anaerobic digester