

PROJECT NAME

WASTE TO ENERGY

PROJECT HIGHLIGHTS

- Provision of support for internal audits
- Support for confirmation of feedstock composition and regulatory applications
- Project support for integration of new equipment/processes to existing plant infrastructure (overall control scheme, steam utilization, ease of operation, PFDs, PIDs, Mass and Energy Balance, Single Lines)
- Project support for assembly of mechanical, civil and electrical bid documentation

PROJECT DESCRIPTION

Gemini was contracted to assist Cargill Meat Solutions High River in the development of their strategy to mitigate high waste disposal costs. For reasons of a Canadian Feed Ban Rule that is more stringent than that in the U.S., processors have been subject to increased disposal costs. Cargill adopted a process that allows its operating facility to accumulate and store waste streams such as paunch manure, pen manure, activated sludge and Specified Risk Materials (SRM's are typically rendered materials that are now suspected to be a cause of BSE in the cattle supply chain and are banned from rendering and must be disposed of separately). Extensive testing and piloting has shown that in the correct ratios and conditions these waste streams can be utilized as solid fuel in a fluidized bed boiler. From this research, Cargill designed a process that collects and dewateres the solid fuel to a desired moisture content, for efficient combustion in the Fluidized Bed Boiler to produce high pressure steam. The generated steam will then pass through a back pressure turbine creating a portion of the base electrical load for the facility. The resultant low pressure process steam following the turbine will then replace a portion of the natural gas generated steam for the facility. This process will replace approximately 15 per cent of the plant's electrical load and 60 per cent of the plant's steam load (60,000 lb/hr) by using waste streams versus purchasing the electricity or natural gas from the commercial distribution grid. The process generates 1.4 MW and reduces offsite waste handling by 3.5 million lbs per year.

SCOPE OF WORK

Gemini's scope of work was to initially assist Cargill in the development of its project charter that was submitted to corporate for final funding approval. As part of this support work, Gemini undertook preliminary engineering activities to develop a common process flow diagram, mass and energy balances and thermal energy recovery strategies based on steam load distribution within the plant. Upon completion and approval of the project charter approval of funds, Gemini conducted detailed engineering to oversee the work to integrate the different vendor design packages and to link to the existing plant.

RELEVANT SKILLS EMPLOYED

Gemini has considerable expertise and knowledge in these types of waste to energy technologies. Gemini has inspected and worked with facilities in Europe where this technology is common for the treatment and disposal of animal by-products. The knowledge of its staff has enabled Gemini to identify early within the design phase, value engineering, strategies to energy conservation, fugitive emission reduction and water reduction.

