Market Segment: Methane Gas/Sustainable Development

POWER PROFILE

Customer: Kalasin Waste to Energy Co., Ltd.

Location:
Kalasin Province, Thailand

Customer Business Issue:
Electric power generation for domestic use and sale of excess power to the local utility grid

Solution:
- One Cat® G3516 gas generator set for 1040 kW prime power

Design, installation, commissioning, and periodic maintenance of a biogas-fueled electric power generator and its control panel, as well as its upstream electrical connections to the power plant.

Cat® Dealer:
Metro Machinery Co., Ltd.,
Bangkok, Thailand

POWER NEED
As a fuel source for electric power generation, Kalasin Waste to Energy Co., Ltd. sought to utilize the biogas produced by the wastewater of a local tapioca starch factory.

Kalasin was established by Clean Thai, a Thailand-based company that specializes in the production of biogas from agricultural and process waste streams. Kalasin was to operate the power plant which would generate power from the methane biogas produced by tapioca waste at the Kalasin Starch factory in Kalasin Province, Thailand. The power generated would be sold first to the Kalasin Starch factory to meet the factory's power requirement, and the remainder sold to the local electric power grid.

The Kalasin Starch factory uses the fruit of the tapioca plant to produce starch for food and medical products. The organic waste generated from the starch production process is channeled to an anaerobic digester, where it generates methane gas that will be used to fuel the Cat gas generator. Approximately 12,000 Nm^3 of digester gas is generated daily and will be fed to the gas generator for power generation. The power generated from the biogas-fueled generator will be sufficient to meet the entire power requirement of the plant.

SOLUTION
First, an evaluation of the Kalasin Starch factory was necessary to determine overall power need, as well as an analysis of the methane (both quantity and quality) generated from the starch production. Once this assessment was complete, an appropriately sized, low-energy fuel compatible generator set engine was recommended by Metro Machinery Co., Ltd., (Metro) the local Cat dealer. A Caterpillar G3516 generator set was selected by Kalasin because of Caterpillar's reputation for quality power-generating equipment and the capability of the local Cat dealer to provide service and support. Metro's extensive knowledge of biogas systems and proven expertise in methane-fueled generator set applications also played a role in the selection process. Kalasin is confident that both the quality of the Cat generator set and the dealer support provided for it by Metro will minimize any downtime and ensure a significant return on its investment.

RESULTS
The Cat gas generator set is currently in the process of being installed at the Kalasin Starch factory. When the initial installation is complete and the unit is commissioned, it is expected to produce over 1 MW of power. Kalasin anticipates that the unit will meet its target return on investment of approximately 16 million baht per year. Plans are currently underway to expand this biogas project to generate up to 9 MW of power in the future.

Beyond the economic benefit, the waste gas will not be released into the environment. There are mounting environmental concerns regarding methane migration as it has been estimated that this gas is over 20 times more effective in trapping heat in the atmosphere than carbon dioxide (CO_2) over a 100-year period. In addition, any energy created by the methane utilized in the generator set offsets the emissions that would be created if power was supplied by a standard coal-fired facility.

For more information, please visit
cat.com/powergeneration

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