

# Pig Farm Runs on Renewable Energy

## Co-Gen System Produces Electricity and Heat from Digester Gas

A Dresser Waukesha gas engine-generator set at a large pig farm in The Philippines is an essential component in a system that is making the most of a renewable energy resource, generating energy cost savings and reducing the damaging effects of greenhouse gases.

Located about 60 km (40 miles) south of Manila, Cavite Pig City Inc. (CPC) is an advanced facility with a population of 100,000 pigs and a commitment to environmental responsibility. With such a large pig population, CPC faces a larger-than-usual version of the challenge shared by all livestock producers – what to do with the animals’ waste.

**“CPC [has invested in] a technology that converts a waste product into a valuable resource. It reduces the farm’s energy costs and avoids emitting methane into the atmosphere.”**

*Bob Weston, Managing Director, Entec Services, Ltd.*

The solution adopted by CPC in early 2009 was to use methane from the animals’ waste – a true renewable resource – as the fuel for an onsite power plant. The power plant is a Waukesha APG1000 high-efficiency 1.1MW genset in a



*About 30% of the hot water from the engine jacket and intercooler circuits is circulated through plates in the floor of the building, which houses newborn piglets, to provide a consistent heat. This, in turn, improves the young animals’ health and reduces the mortality rate.*

## Location

Cavite City, The Philippines

## Engines

A Waukesha APG1000 high-efficiency 1.1MW genset

## Story

A Dresser Waukesha generator set running on digester gas produced from animal waste meets all of a large pig farm’s electrical and heating needs with enough left over to sell to the local grid.

combined-heat-and-power (CHP) configuration. The largest single biogas power plant in The Philippines, it generates electricity, and captures the engine’s waste heat for use in other essential farm operations.

Initially, the farm had used anaerobic lagoons to break down, process and treat the waste. Recently, the lagoons were replaced with a new, two-stage biogas digester that improves the quality of treated waste. One of the primary by-products of the process is digester gas, with a composition of about 60% methane and 40% carbon dioxide. Methane is a potent greenhouse gas with 21 times the global warming potential of carbon dioxide. Burning the methane as fuel for the power plant prevents it from being released into the air.

At present, the power plant is operating at full rated load. Forty percent of the electricity it generates supplies all of the farm’s electrical needs, including powering the mill that processes pelletized feed for the animals and a cool cell ventilation system for the barns. The excess electrical output

## Case Study #1431, Cavite City, The Philippines, Digester Gas Site

is sold to the grid, an additional benefit for the owners in a country with some of the highest electricity costs in the region.

The farm maximizes the engine's efficiency by utilizing the hot water recovered from the engine jacket and high-temperature intercooler circuits to supply heat where needed. About 30 percent of the hot water is circulated through plates in the floor of the building housing the newborn piglets to provide consistent heat, which improves the young animals' health and reduces mortality among them. Sixty percent of the heat goes to the feed mill boiler which produces steam for the pelletizing process. Plant operators estimate that using engine heat saves them about \$100 (US) per hour in energy costs when the boiler is operating.

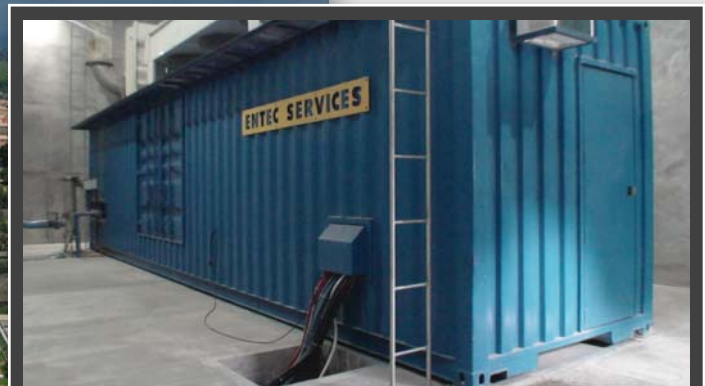
The generator set was supplied by Entec Services Ltd., Waukesha's Auckland, New Zealand-based distributor with extensive experience in biogas engine projects. The genset was pre-packaged with a dump heat radiator, PLC controls, switchgear panel and heat recovery equipment in a modified

40-foot shipping container for easy installation on site. Onsite, the plant required only a fuel gas source, electrical and water connections.

Entec equipped the genset with an operator panel for on-site and remote control and monitoring of the system's operating parameters including exhaust temperatures, fuel pressure, etc. Ongoing service for the Cavite Pig City power plant is provided by Uptown Industrial Sales, Dresser Waukesha's authorized distributor in The Philippines, along with remote support by Entec.

"Cavite Pig City prides itself as being an innovative and professional producer that excels at quality and animal welfare," said Bob Weston, managing director, Entec Services. "With this project CPC demonstrates further leadership in The Philippine pig farming industry by investing in technology that converts a waste product into a valuable resource. The project reduces the farm's energy costs and avoids emitting methane into the atmosphere."

An aerial view of Cavite Pig City, which typically houses 100,000 pigs.



A 1.1 MW APG1000 Waukesha genset packaged in a shipping container, was supplied by Entec Services Ltd., Waukesha's Auckland, New Zealand-based distributor. Onsite, the plant required only a fuel gas source, electrical and water connections.

### Dresser Inc.

#### Dresser Waukesha

1101 West St. Paul Avenue  
Waukesha, WI 53188-4999  
T. 262 547 3311  
F. 262 549 2795

Bulletin 1431 0810

