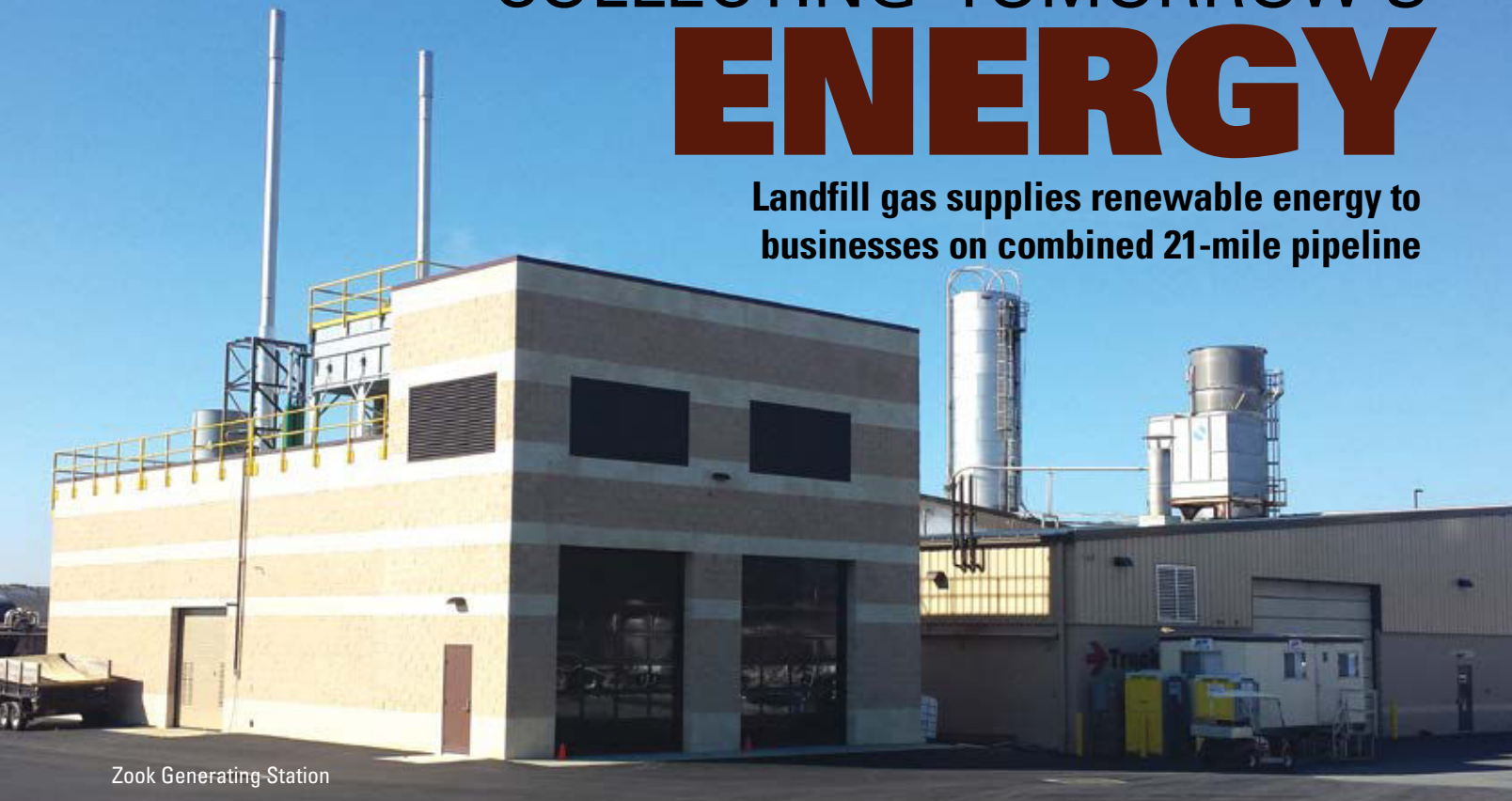


# COLLECTING TOMORROW'S ENERGY

Landfill gas supplies renewable energy to businesses on combined 21-mile pipeline



Zook Generating Station

## Customer Profile

### **Granger Energy Services**

**LOCATION:** Lansing, Mich.

**APPLICATION:** Landfill gas

#### **PENNSYLVANIA PIPELINE**

**FACILITIES:** Morgantown Gas Compressor Station, Honey Brook Gas Compressor & Generating Station, Zook Generating Station

**GAS PIPELINE CUSTOMERS:** L&S Sweeteners/Zook Molasses Co., Dart Container Corp., Advanced Food Products, Case New Holland, Tyson, York Building Products, H.R. Ewell, Inc.

**CAT EQUIPMENT:** G3520C generator sets (4)

Pennsylvania Amish country is a land of rolling hills, with lush green fields and large farmscapes that harken back to a simpler time. Horse-drawn carriages share the road, while tourists are drawn to quilt shops and independent handmade furniture makers in this quasi-rural area located 70 miles northwest of Philadelphia.

In this pastoral setting, one of the largest landfill gas operations of its kind in the U.S. provides energy to seven businesses from methane gas collected at two landfills in Lancaster County.

At the top of a combined 21-mile gas pipeline, a compressor station processes gas from the Conestoga landfill and sends it down an eight-mile pipeline, where it joins with the 13-mile long Honey Brook pipeline, which originates from the Lanchester landfill in Narvon. Combined, the two plants produce 10,000 standard cubic feet of methane per minute.

Naturally occurring gas in landfills is comprised of about 50 percent methane, which has half the BTU value of natural gas. Landfill gas is captured through a perforated well pipe and gathering system. The gas is extracted from the landfill into a compressor station, processed, and used as a fuel source for four Cat® G3520C generator sets.

Operated by Michigan-based Granger Energy Services, the Honey Brook

*Continued on page 10*



Dan Zimmerman

Generating & Gas Compressor Station processes landfill gas for direct use by the business customers connected to the pipeline, and electric power generation provided by two Cat G3520C generator sets. The generators have the capacity to produce 3.2 MW of electricity—some of which is used to power the gas compressor station, with the remainder delivered to PPL Electric Utilities.

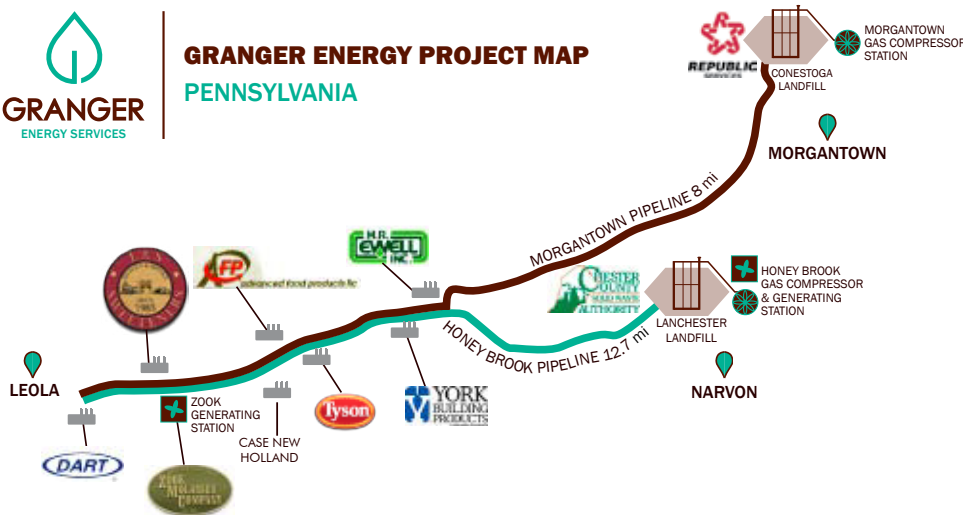
Near the southern end of the pipeline, the Zook Generating Station utilizes another two Cat G3520C generator sets to supply the on-site electric power needs of L&S Sweeteners, while the remaining power is delivered to the utility grid.

Landfill gas that is not consumed at L&S Sweeteners and its parent company, Zook Molasses, serves the energy needs of six other business on the pipeline, where the gas is used to fuel turbine generators, boilers or other types of combustion equipment.

“Landfills are no longer just safe repositories for storing waste,” says Joel Zylstra, chief operating officer for Granger Energy Services, which operates landfill gas projects throughout its home state of Michigan, as well as in Alabama, Indiana, Ohio, Pennsylvania and Utah. “Now, they are an even greater resource as we tap into landfills to collect tomorrow’s energy.”



## GRANGER ENERGY PROJECT MAP PENNSYLVANIA



**“We’re running 365 days a year, and if something goes down and we have trouble with it, we know that we can count on our Cat dealer to stand up to the plate and help us keep those generation systems up and running.”**

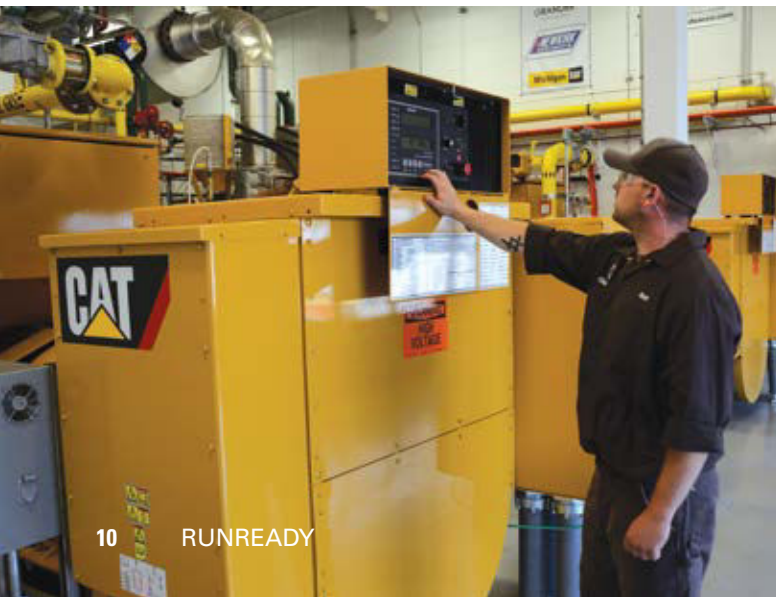
**Dan Zimmerman**  
Director of Pennsylvania Operations  
Granger Energy Services

Landfill gas projects are one of the most cost-effective of all types of renewable energy projects, producing highly reliable, base-load power. Along the 21-mile Pennsylvania pipeline, annual energy savings equate to heat for more than 34,500 homes, and enough electricity to power more than 3,800 homes.

“Using landfill gas as a green energy source is very beneficial to the community, because instead of using oil or natural gas, we’re using a landfill gas which would otherwise be burned off in a flare,” adds Nick Rogers, Pennsylvania operations coordinator for Granger Energy.

### Cat ET monitors genset performance

At the Honey Brook station, two generator sets that were converted from running diesel fuel to landfill gas operate around the clock. They are connected to Cat Electronic Technician (Cat ET), a diagnostic software designed to communicate, diagnose and service electronically controlled Caterpillar engines and generators. When connected to an



## RELIABLE PERFORMANCE

Before Granger started developing the project in eastern Pennsylvania during 2004, it had an established relationship with its Cat dealer, Michigan Cat, based on developing landfill gas projects in Michigan dating back to 1985.

“Over the course of 30 years, we’ve had a very good relationship with Michigan Cat as a resource for parts and equipment, and helping us diagnose issues and solve problems in short order,” says Dan Zimmerman, Granger’s director of Pennsylvania operations.

“We need that kind of relationship in order to maintain the amount of uptime required by our facilities,” Zimmerman says. “We’re running 365 days a year, and if something goes down and we have trouble with it, we know that we can count on our Cat dealer to stand up to the plate and help us keep those generation systems up and running.”

## A HISTORY OF GRANGER



Granger got its start in 1966 when two brothers began hauling trash for construction companies and commercial customers in Lansing, Mich. Over time, the family-owned business has evolved into a comprehensive environmental management service company, providing a range of services for customers including waste collection, disposal, recycling and renewable energy production.

With an initial truck purchase, Granger established the hauling services that would become the most recognizable component of the company. As a leader in the service industry, Granger now offers solid waste and recyclable materials collection for industrial, commercial, construction, apartment and residential customers.

As owner-operator of two landfills in the greater Lansing area since 1973, Granger is committed to the responsible environmental disposal of municipal solid waste. Granger proved itself an environmental leader in 1985 when it became the first company in Michigan to make practical use of landfill gas for renewable energy production.

Today, Granger Energy Services has 12 electric plants and four direct-use projects in Michigan and other parts of the country. Additional projects are currently under development.

Granger employs more than 260 associates in various professional, technical and service positions.

Electronic Control Module (ECM), a technician has the ability to diagnose existing and potential problems, configure the product, and obtain data for analysis.

Cat ET monitors every aspect of genset operation, including air intake, oil temperature, coolant temperature, power output and more.

“ET gives us an overall snapshot of how each genset is running on a day-to-day and hour-to-hour basis,” says Christian Adames, an operations technician at the Honey Brook station. “It gives us all the numbers that we need to know. For instance, if we are doing an oil change, Cat ET indicates if all differential pressures or differential temperatures are close enough to tell us we need to do maintenance sooner than normal, or maybe prolong it a little bit. It tells us if we’re getting close to a maintenance interval.”

If there is an operating issue with a generator set, one of the operators on call at the Zook Generating Station is automatically notified via phone, says operations technician Mat Griffis.

Adames says the Cat generator sets experience very little downtime, other than scheduled maintenance intervals.

“Anybody would think running 24/7 might be a little hard on an engine,” he says. “But Caterpillar did a great job engineering these generator sets—they’re very reliable.”

