

# Pressure Testing – Vaetrix and Biogas Production



It's always good if we can look back at the past to learn and make changes to better things in the future. Most early farms, ranches, and residential operations were independent and getting their power from wind or water resources. A recent surge in technology is now allowing farmers to become energy independent by producing Biogas by simply managing their manure from cattle, poultry, horses, and other livestock. Recovered Biogas can be an electricity source, heating element, or even a fuel for vehicles.



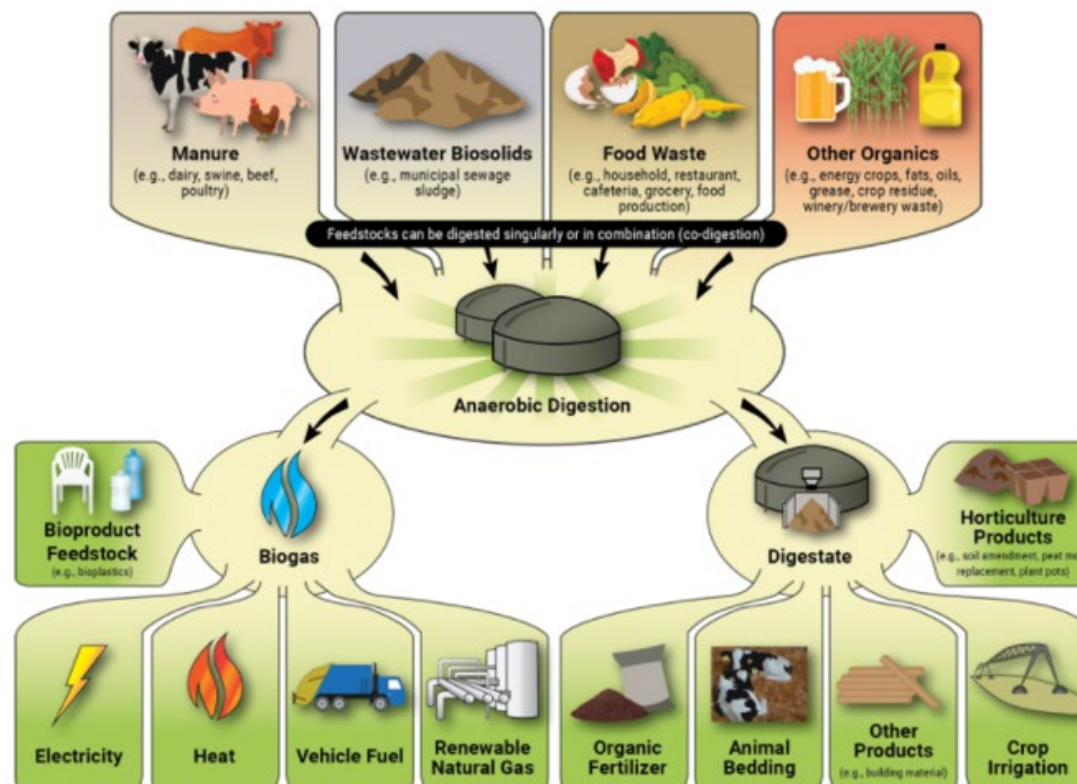
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# Biogas – How does it get produced?

Biogas is created by a process called anaerobic digestion. Bacteria typically housed in a sealed vessel, break down or digest the waste and produce a biogas and digestate. The solid and liquid material of the digestion process is discharged from the digester. The illustration below puts it in simple terms.



Reference: <https://www.epa.gov/agstar>

A manure digester placed on a large dairy farm or even shared among several farmers can provide the following benefits:

- Provide electricity for the farm to light, heat, or cool buildings.
- Allow farmers to run off grid to save money and rely on local utilities.
- Feedback to grid to help utility manage peak requirements.
- Reduce the greenhouse gas emissions by capturing the methane that is normally discharged to the environment.
- Help reduce the use of fossil fuels for various vehicles used on the farm.



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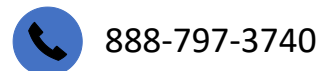


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# How did Vaetrix get involved with Biogas?



The biogas produced by the anaerobic digestion process is carried in pipelines. Most pipelines are Polyethylene (plastic) and range from ½” to 10”. These sections of pipe that vary from 40’ are joined by electrofusion welding. A heating coil melts the plastic together using by closing regulating temperature, time, and pressure. Most fusion machines or (ECU) Electro fusion control units can be operated by one man once properly trained in the process. The end result or length of fused pipeline must be tested under pressure according to federal and local guidelines to ensure there are no leaks. A leak would defeat the whole purpose of gathering biogas to help reduce greenhouse emissions.



# How did Vaetrix get involved with Biogas?



In this particular application in Michigan a contractor purchased an HTGX which closely monitors and records both pressure and two temperatures. The contractor applied 900 PSI using Nitrogen bottles and had to hold the pressure steady for 4 hours. What makes the application challenging is the influence of local weather conditions (mostly temperature).. As the temperature increases the plastic exposed pipeline heats up and pressure builds, to regulate the pressure, there are often bleed valves installed so that the contractor can hold the pressure with a test window. The opposite occurs when the temperature drops, the contractor may have to apply more pressure from the nitrogen source. The end test result must be analyzed to ensure there no leaks.

The Vaetrix HTGX digitally records the pressure and temperature up to one time a second so the end user can see the actual readings and look at a chart to detect any trends. The typical paper chart recorder used to test these pipelines just provides an ink line that rotates in a circle. The HTGX not only allows the contractor to see more resolution, it saves them a ton of setup time and the end result is a digital .pdf file than can be emailed or printed.



# How did Vaetrix get involved with Biogas?

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### Data Table

Logger: Vaetrix HTG-5K-I-05-BT-RTD S/N 1592333684  
Range: 5000.0 PSI  
Session: Vaetrix HTG Sample Data File

Sample No.	Time	Pressure PSI	Ambient °F	RTD °F
1	7:50:55 AM 6/30/2020	48.7	75.26	77.35
2	7:51:00 AM 6/30/2020	48.8	75.28	77.47
3	7:51:05 AM 6/30/2020	48.7	75.26	77.37
4	7:51:10 AM 6/30/2020	48.7	75.25	77.27
5	7:51:15 AM 6/30/2020	49.6	75.24	77.42
6	7:51:20 AM 6/30/2020	52.5	75.24	77.35
7	7:51:25 AM 6/30/2020	55.2	75.22	77.27
8	7:51:30 AM 6/30/2020	58.1	75.22	77.27

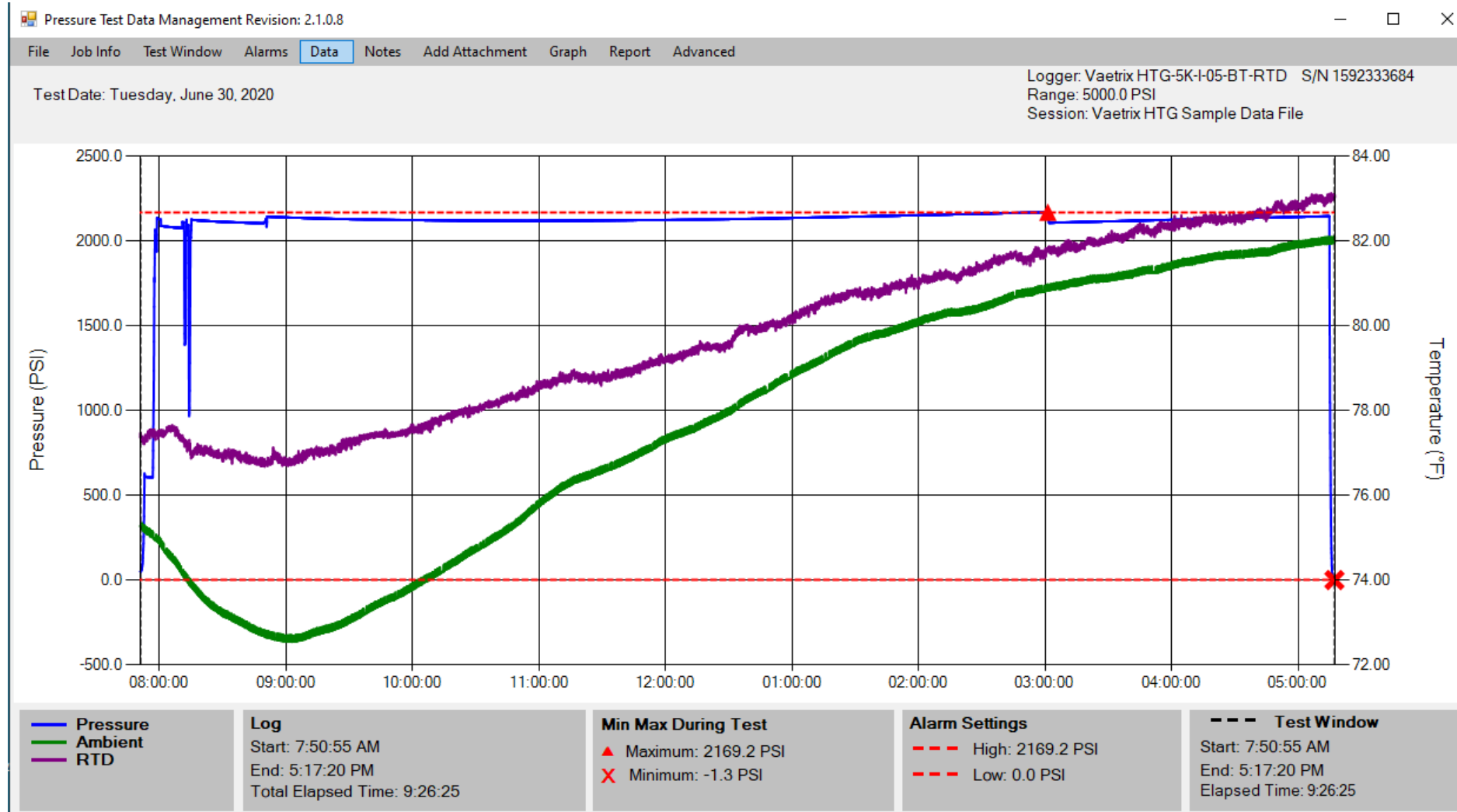


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# How did Vaetrix get involved with Biogas?



# Pipeline to Digester



# Pipeline to Roadway and Local Farm



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