

RENEWABLE ENERGY SOLUTIONS

# Turning digester gas into energy





The average American creates approximately 100 gallons of wastewater every day, which must be treated and purified before being reintroduced to the environment. Anaerobic digestion, a process many wastewater treatment plants use in purification creates usable methane gas as a byproduct. Johnson Controls digester gas solutions can help you take advantage of this gas byproduct by converting it into energy. We'll take responsibility for the design, engineering, installation, commissioning, operation and maintenance of a digester gas solution that fits your application.

### Applications

- Gas produced by anaerobic digestion is usually more than 60 percent methane and can reach concentrations of up to 95 percent. Properly collected, this gas can serve as a natural gas substitute in applications such as boilers, hot water heaters, reciprocating engines, turbines and fuel cells.
- A more common use of the methane is for internal process heat used in the wastewater digesting process, which can be provided directly or by converting to steam in a boiler.
- The most popular technology, converting wastewater treatment gas to electricity employs internal-combustion engines that run a generator, which produces the electricity. This is used to power internal operations and the excess is sold back to the grid. Heat generated by the engines can be recovered and used to heat digesters and plant facilities, optimizing the overall system efficiency. Microturbines can also be used to produce electricity, and can be modularized and easily expanded as gas production increases.

### Why Johnson Controls

Johnson Controls is a \$32 billion leader in energy and environmental solutions. Our contracts often include a performance guarantee, reducing your risk. Our global experience in energy supply- and demand-side businesses, along with 120 years of building expertise, make us well suited for these applications. With 500 offices around the world, we can deliver solutions anywhere you need them.

### DIGESTER GAS FACTS:

There are 16,000 wastewater treatment plants in the United States. More than 3,500 of them employ anaerobic digestion but only two percent utilize the digester gas byproduct to produce electricity. Wastewater treatment plant gas-to-energy projects can provide immediate and long-term benefits, including:

- Energy cost savings
- Progress toward environmental goals
- Energy security – When digester gas is piped directly to its end use, it provides security from interruptions in the gas and electric grids. Digester gas systems provide the lowest cost while still accommodating a steady base load for facilities that require back-up or standby electricity generation.
- Utility cost stabilization – Wastewater treatment plant digester gas solutions provide an excellent hedge against fluctuations in fuel and electricity prices.
- Environmental benefits – Significant reductions in greenhouse gas emissions since the methane from wastewater is 25 times more harmful to the atmosphere than carbon dioxide.

(Source: Federal Energy Management Program – FEMP Focus, Winter/Spring 2005)

### WHERE WE'RE WORKING:

#### Back River Wastewater Treatment Plant

In Baltimore, Maryland, Johnson Controls installed a 3 megawatt combined heat and power plant that uses digester gas to generate more than 2.4 megawatt hours of electricity per year. The plant also generates steam to offset process heating requirements and produce hot water for boiler use.