

Renewable Natural Gas (RNG)

The effective utilization of renewable energy sources is crucial to the global transition away from fossil fuels. At Anguil, we offer quality engineered pollution control solutions that ensure the byproducts of the bioenergy production processes are not offsetting the benefits of these crucial initiatives



SOURCES OF BIOMASS

Solid Waste
Decomposition
at Landfills

Manure in
Anaerobic
Digesters

Waste Food
Decay

Crop Residue
From Farming

Municipal
Solid Waste
Treatment

OVERVIEW

In broad terms, Renewable Natural Gas (RNG) refers to the utilization of waste biogases for use as an alternative to fossil fuels. The sources of biogas are numerous; essentially, anywhere organic waste gases and liquids are generated, collected, and concentrated for the purpose of supplying alternative fuels can be considered an RNG operation.

When organic waste decomposes in an oxygen-free environment, the biological process releases methane gas that can be used to produce energy instead of being released into the atmosphere. When left untreated, emissions and water run-off from these sources are released directly into the environment where they contribute to climate change and soil or water contamination. While RNG offers a wide range of benefits, the processes used to produce it can create harmful air pollutants and contaminated water if careful consideration is not given to the byproducts.

CHALLENGING CONDITIONS

The resource recovery process can be challenging due to the unique operating conditions at an RNG facility. Unlike a typical manufacturing facility with consistent byproduct output, RNG facilities face varying concentration levels of a wide range of air and water pollutants. Additionally, methane and longer chain hydrocarbons found in biogas are highly flammable and possess a high energy content, which makes it a hazard under certain conditions.

RNG POLLUTION TECHNOLOGIES SHOULD BE DESIGNED AROUND:



Renewable Natural Gas

AIR POLLUTION CONTROL

There are several steps involved with cleaning biogas and treating the processing plant tail gas. First, hydrogen sulfide (H₂S), which is a highly corrosive compound, needs to be removed. This can be accomplished using a dry scrubber or carbon absorber. Filtration using an activated carbon adsorption bed effectively traps and removes H₂S particles from waste gas. Next, CO₂, nitrogen, oxygen, and other unwanted chemicals are removed using sieves and other technologies to clean the gas until it reaches natural gas specifications, making it suitable for local pipelines. During this cleaning process, waste gas or tail gas is created that must be treated before it can be released into the atmosphere.



Anguil thermal oxidizers and vapor combustors can eliminate over 99% of the off-gases from the various RNG purification processes. The chemical process of thermal oxidation involves raising the exhaust stream temperature to the point that the chemical bonds which hold the molecules together are broken. The low heating value methane and VOCs in the process exhaust stream are converted to various combinations of carbon dioxide (CO₂), water (H₂O), and thermal energy. As is the case with other industrial emission combustion, it is important to minimize the overall supplemental fuel combustion from the destruction device.

During normal operation, Anguil systems are capable of handling low-flow situations such as excess landfill gas or high-flow process vapors due to an upset condition. We also offer dual burner and dual fan configurations for ultimate control of the process both before and after going through an upgrading process to make RNG.

WASTEWATER TREATMENT

In wastewater treatment, anaerobic digesters help to manage waste and produce renewable energy. The anaerobic digestion wastewater treatment process involves a series of processes where wastewater biosolids are broken down by bacteria in the absence of oxygen. Once the bacteria consumes the suspended particles, all solid matter is then removed before the digesters break down the waste and create digester gas (carbon dioxide and methane).



The digester gas can then be converted to renewable energy to fuel onsite boilers, generate heat or electricity, and more. Anguil's vapor combustors are utilized in these applications to destroy the harmful pollutants and off-gases generated during the anaerobic digestion and RNG production processes.

Wastewater treatment systems used for RNG use various mechanisms and techniques to return contaminated water to its initial state. Anguil's pollution abatement experts can provide optimized solutions to solve your industrial water purification challenges. We consider the specific function and role of each component and deliver an efficient, cohesive, and properly integrated system.

Have a Similar Application? Anguil Can Help!



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