



Biogas Technologies

Biogas is the natural product generated during digestion process of organic substances under anaerobic environment. The sources of organic substances could be wastewater and wastes produced from factories, agricultures, commercial buildings, households or harvested energy crops. The composition of biogas usually consists of Methane (CH_4) approximately 50-70% that is combustible and can be used as alternative fuel to substitute fossil fuel or used for electricity generation.



Biogas Plan in Overview

Green Energy Network Co., Ltd. (GEN) provides services of consultancy, feasibility study, engineering design, equipments supplies, turn-key contractor or BOT with specialty design of following biogas technologies;

1. Continuous Stirred-Tank Reactor (CSTR)

CSTR is the stirred digester to mix and digest organic substances with high solid content at high efficiency. According to its stirring system, it can enhance mixing of organic substances with microorganism. In addition, it can break floating scum layer, reduce sediments, and dilute effect of toxicity substances inside digester.



Bolted Glass-Fused-Steel CSTR

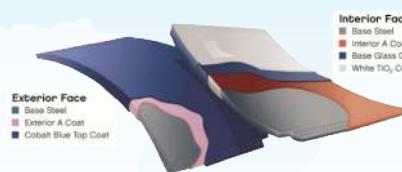


Folding Edge Steel CSTR



Folding Edge Steel CSTR

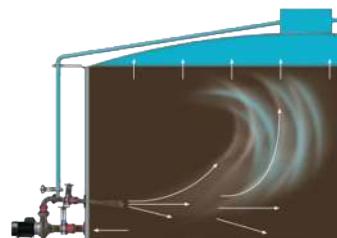
Physical Properties – Glass-Fused-to-Steel Vitrium Technology



Bolted Glass-Fused-Steel



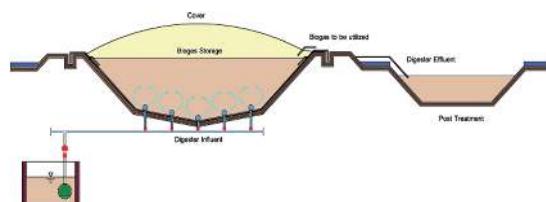
Folding Steel Sheet



GasMix (Landia®) is used to completely circulate substrates to reach highest gas production.

2. Modified Covered Lagoon (MCL)

MCL technology is developed from conventional anaerobic lagoon that can overcome sludge sediment and accumulation problem. The process starts by entering wastewater from the bottom level of MCL to mix with microorganism (anaerobic sludge). The substrates inside digester will be automatical circulated through networks of solenoid actuator valves and pipings, and sediment sludge will be collected at the end of the lagoon. Due to the advanced design of sludge re-circulation, MCL could be operated at high stability and efficiency. The generated biogas under the covered HDPE/PVC sheet is collected and utilized as alternative energy.



Sludge Circulation Concept inside MCL



3. Two Stages Reactor

Two Stages Reactor is the most flexible and efficient combined biogas technologies, which we have proposed to use both CSTR and MCL, as the 1st stage and 2nd stage digester respectively. The advantages of this design are its higher digestion efficiency & better gas production, better treated wastewater qualities and more operational flexibility of biogas storage and utilization.



Two Stages Reactor Technology

Project References



Two Stages Reactor for Biogas Production from Palm Oil Mill Effluent (POME)



MCL Digesters



Two Stages Reactor for Biogas Production from Energy Crop (Napier Grasses)

Biogas Upgrading: H₂S Bio-Scrubber System For Treatment of Biogas from POME

Biogas is normally comprises of mixed portions of Methane (CH₄), Carbon Dioxide (CO₂) and Hydrogen Sulfide (H₂S) gases. H₂S bio-scrubber is used to reduce the content of H₂S gas in raw biogas providing a cleaner and less corrosive gas for engine combustion and gas burner. The content of H₂S in raw biogas will typically be in the range of 1,000 – 20,000 ppm, which its combustion and humidity in gases can produce Sulfuric Acid and leads to severe corrosion of a engine parts, valves and pipes.

Reduction of H₂S has several ways to do, but the most efficient and least operating cost is to biological process, use Bio-Scrubber that has no need of chemicals added. Thiobacillus Sp. is groups of bacteria to be used in Bio-Scrubber system which can transform H₂S to be solid elementary sulfur.

Project References



H₂S Bio-Scrubber System, Tha Sae Cooperatives, Chumporn Province