THE BIOCONVERTER SOLUTION

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BioConverter technology can convert organic waste of any quantity from a village, town or city to produce self-sustaining green energy and organic fertilizer.

BioConverter will receive and process waste at its facilities for a fee per ton at or below the normal tipping fee for disposal of the same ton of waste at transfer stations and landfills in the local area. Each BioConverter system processing 1000 tons per day of green waste is able to produce 15 MW per day of renewable electricity. An alternative energy product in place of electricity is methane produced either as liquid (LNG) or compressed (CNG) natural gas for sale to municipal and industrial fleets. A BioConverter system provides a sustainable supply of clean renewable fuel. Co-products of a 1000 ton system include approximately 200 tons of organic fertilizer and 100,000 gallons of organic plant food.

BioConverter can accept and convert all manner of organic wastes, including manure and other agricultural waste and primary and secondary sewage (biosolids) from municipal and industrial wastewater treatment systems. As food waste and biosolids are available and added to the input of the facility, the volume of pasteurized liquid plant food and recycled water will increase proportional to the increased moisture content of the food waste and/or biosolids added. For example, a system processing 2500 tons per day of green waste and food waste by the use of steam recovered from the combustion turbine exhaust is able to produce up to 300,000 gallons of recycled water per day.

Developing countries have extreme needs for clean water, clean energy, organic fertilizer and food, and produce twice as much biodegradable waste in the solid waste stream as developed countries with a higher per capita income. The BioConverter is able to address these needs, while significantly reducing methane and other air pollutants and their combined negative effects contributing to global warming.

Except for importing potassium and phosphorus fertilizers, if these elements are depleted from the soil bed to support the growth of crops and soft wood trees, only the addition of urea or another source of nitrogen would be necessary through one or two crop cycles given any type of water availability. Planted soft-wood nitrogen-fixing leguminous trees and field crops (carob, peas, beans, soya) can provide the nitrogen to the soil bed to grow grasses, forage and food crops. The green matter and biomass waste harvested in the maintenance of these crops, even in the early stages, can be feedstock for the simple BioConverter system.

With a daily diet of a small amount of protein, plus carbohydrate/starch from cassava root or other root crops, vegetables and fruit needed to sustain the local community, it is possible to capture and recycle all of the nutrients first used to produce the food, forage and feed, from the food residues, including liquid and solid human wastes, all animal wastes if available plus any crop residues through the use of the BioConverter.

With this input BioConverter is able to produce energy as BioGas and nutrient fertilizers are recycled and available in liquid and solid form, free of pathogens, for reuse in the fields for food and crops of importance to the village. The BioGas from the BioConverter system is best

used for cooking, producing clean and hot water and some electricity using available simple gas-fired engine generators. In the future the use of small micro-turbines and fuel cells will be possible when these energy innovations are manufactured in sufficiently large numbers to reduce their cost.

TECHNOLOGY OVERVIEW

The BioConverter System processes source-segregated solid wastes in a high-efficiency anaerobic digestion system to produce BioGas energy and useful co-products. The BioGas is a clean biological source of methane, with a medium BTU content, for use as fuel in combustion turbine generation of electricity.

In BioConverter systems up to 3000 tons per day of organic wastes can be received, pre-processed to remove contaminants and transferred to covered conveyors to move the material from the receiving end to the discharge end, where the material is conveyed into “pulping tanks”, where blending and size reduction occur.

When the batches are ready, they are pumped into BioConverters, where bioconversion (anaerobic digestion) takes place. In the BioConverters, naturally-occurring anaerobic bacteria convert the wastes into BioGas, a medium-BTU gas (65% methane). This BioGas passes through scrubbers that remove hydrogen sulfide. The “scrubbed” BioGas is then routed to a combustion turbine or fuel cell to produce electricity. Heat is recovered as steam for use in the dryers. With further processing, BioGas may be purified to 99% methane and compressed or liquefied for use as vehicle fuel. In addition, methane can be reformed to produce hydrogen for use in fuel cells or reformed into methanol for use as a liquid fuel. Not all of the organic waste is converted to BioGas.

Due to its inherent nature, some of the organic material remains in the effluent from the BioConverters. This material (fibrous, non-digested and non-digestible solids) is screened, pressed and placed into the dryer for pasteurization and conditioning. The resulting solid product is an excellent slow-release soil amendment qualifying as organic fertilizer. The “screened” effluent undergoes pasteurization to produce a low analysis liquid fertilizer and plant food. Both co-products, BioGreen Organic Fertilizer and Liquid Plant Food are stored and shipped in bulk.

The only residuals are grit which can be used as recycled road base. As a green resource recycling facility processing biomass and as a co-generation facility, the system is allowed to generate emissions of no more than 25 ppm NOx from the combustion of the BioGas in the combustion turbines. If required by local regulation, these emissions will be mitigated by the use of best available control technology (BACT).