

Product Line: Toterra

Business Division: Waste Recovery Systems

The only known zero emissions zero waste solution on the market

Eliminates the need for other waste disposal methods, including:
incineration, gasification, ocean dumping and landfills!

Problem/Need: Waste management is a global problem. Every day over 320,000 tons of solid waste is generated in the US. Municipalities across the country are asked to dispose of this waste material and are turning to environmentally harmful landfills, incineration and gasification alternatives. Recycling efforts have grown and have reduced the rate of landfill growth in recent years with China purchasing approximately \$16 billion dollars of the worlds recyclable trash. China recently announced that in 2018 they are going suspending and possibly ending these purchases, thus creating a great deal more pressure on the US disposal problem.

Market Size: The world demand for Waste Recovery Systems (WRS) is measured in tens of thousands of plants. The Company's primary initial domestic focus is scrap tire recycling operations and coal fines processing; initial international focus is landfill remediation and environmental clean-up projects with strategic partners, including ARAMCO in the Middle East.

Product Description: The Toterra Waste Recovery System addresses this global problem with a proprietary zero-emission closed-loop process that converts waste into usable forms of marketable commodities, providing a crucial environmental benefit to society as well as a very attractive return to the plant operator and investors.

Waste material (i.e. scrap tires) is shredded, stored and feed into the electromagnetic induction heating system. By controlling temperature, moisture and pressure, the molecular structure of the input material is broken down into their basic form producing syngas and other solid substances. A portion of the syngas is used to power the plant, the balance is used to produce electricity for general use or processed through Fischer-Tropsch to produce high quality fuels. The entire closed-loop process is conducted in a vacuum, which enables the zero-emission attribute. All the moisture extracted is purified and sold as medical grade distilled water.

The System is currently operating with a functioning 3-ton per day capacity system prototype. Engineering and design work for a 100-tons per day commercial scale processing plant has been completed and prepared for commercialization. A plant consists of seven containerized sub-systems. Seven US based, world class sub-system suppliers have been selected, consulted in detail and are ready to manufacture and timely deliver the plants' components. The commissioning protocol for plants has been defined.

Differentiation/ What's unique: There are hundreds of companies operating over 1,000 facilities worldwide that utilize Gasification and/or Incineration systems in their technology equipment package for processing waste to energy. These processes function by transforming the waste through chemical reactions, which create enormous amounts of hazardous greenhouse gasses (SOx, NOx, VOC's and CO₂) that must be sequestered or released into the atmosphere.

A closed loop, double vacuum, electromagnetic induction heating system is the only known zero emissions zero waste solution on the market.

Strategic Partners:

- Modular portable containers — Wabash National Corp.
- Electromagnetic Induction Heating — Ajax Tocco Magnethermic
- Power System — General Electric
- Nickel and Cobalt Based Alloys — Haynes International, Inc.
- Water Recovery — Parker Hannifin Corporation
- Electronic Command Center — Microsoft and IBM Corporation.

Synergies: There is significant market overlap between the HIVE® and Toterra. In addition to addressing the waste stream, Toterra can be a supplemental power source that can be integrated with the HIVE® to efficiently generate, store and distribute electricity.