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THE FOURTH DIMENSION FOR WASTE MANAGEMENT IN THE UNITED STATES: THERMOSELECT GASIFICATION TECHNOLOGY AND THE HYDROGEN ENERGY ECONOMY

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Introduction

Waste management in the United States presently has the following major three dimensions: Sanitary landfills, recycling, waste to energy predominantly based on the technologies of mass burn technology or refuse derived fuel. These three dimensions have undergone significant evolution during the past three decades. The design of sanitary landfills has evolved to include environmental protection features such as bottom liners, leachate collection systems and landfill gas management systems.. Material recycling programs, many based on materials recycling facilities, have become more prevalent. Approximately 100 operating waste to energy facilities ("Facilities") now exist in the United States. Improvements in the air pollution control systems incorporated in the Facilities have significantly lowered their air emissions. A fourth dimension, waste gasification technology, is evolving as a viable component of a waste management system and the hydrogen energy economy.

This paper addresses a gasification technology ("Technology") in use on a commercial basis at three waste to energy facilities. This Technology was developed by Thermoselect, Inc. ("Thermoselect"), a firm based in Lacarno, Switzerland. Interstate Waste Technologies, Inc. ("IWT"), based in the Philadelphia, Pennsylvania area, has the rights to develop projects with this Technology in North America and certain other areas of the world. (IWT conducts business as Caribe Waste Technologies, Inc. in the Caribbean.)

This Technology has the following cutting edge parameters: A "Syngas" is produced. The Syngas can be used as a fuel or used as a raw material in a manufacturing process. The Technology produces "Materials" saleable in the existing marketplace. Syngas, at present is used to fuel a boiler or an internal combustion engine, resulting in low air emissions.

Technology Operation

Figure 1 on the following page shows a schematic of the Technology. The Technology has the following major processes:

- Waste compaction with a horizontal ram
- Degasification of the waste under high temperatures and pressures.
- Conversion of gases and char into syngas ("Syngas") within a high temperature reactor, followed by a shock cooling vessel and a treatment system.
- Production of metallic and mineral granulates within a homogenization vessel.
- Process water production and cleanup

Following is additional information regarding each of these processes:

Compaction: Waste is transferred from the storage pit to a feed hopper. A horizontal ram moves the waste from the feed hopper and compacts it into the degasification chamber to a density of approximately 2,100 pounds per cubic yard (1,250 kg/cu.m).