Executive in Action: Dr. Peter Tsantrizos, President & CEO of Terragon Environmental Technologies

Turning waste into energy has been his lifework.

 BY WENDY LAURSEN
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The culmination of Dr. Peter Tsantrizos' lifework will be a household appliance that processes waste to provide energy that can provide heat and power refrigeration and air-conditioning systems. For the maritime industry, he has already developed an analogous solution for what he sees as a fundamental flaw in current thinking, because for Tsantrizos there is no such thing as waste.

"We can reduce our energy consumption by up to 25 percent and our water consumption by 75 percent without changing the quality of our lives – by simply enabling ourselves to use the things we now consider waste," he says.

Most people manage the waste they generate by exporting it to others. On land this involves garbage trucks and the sewer system. At sea it involves dumping it overboard, burning it through small high-emission incinerators, or bringing it to shore for disposal. Most current waste-treatment technologies support this approach, says Tsantrizos.

In contrast, Tsantrizos has developed a compact gasification system that processes garbage, oily sludge and other shipboard wastes with no need for pre-processing and no harmful emissions. The system runs on syngas – a byproduct of gasification, making the appliance self-fueling. The system can treat the waste of 500 people, producing just a small amount of bio-char suitable for use as fertilizer.

“Each of us on average generates about 2.5kg of waste a day. With our technology we can generate about 2kWh from a kilogram of garbage, so that waste could be turned into about 25 percent of the energy we use each day,” he says. Some shipboard applications for the energy include refrigeration, heating water for showers and fresh water generators.

The Maritime Connection

It is a timely development for shipping, says Tsantrizos. “Since the new MARPOL Annex V regulations have been in place from the beginning of the year, we see the industry scrambling to deal with onboard storage issues and higher costs to land garbage ashore.”

Funding for the development came from the Canadian and U.S. navies and from Sustainable Development Technology Canada – a foundation created by the Canadian government. Military applications are particularly pertinent as a recent study found that 14 percent of returning troops face health difficulties due to exposure to toxins resulting from the burning of garbage in pits.

The new system provides a solution. It can be run indoors, within the hold of a ship and in remote locations, or it can be used and transported by troops in the field. It has already been trialled on board *HMCS Protecteur* to treat the waste generated by the ship’s 240+ sailors. Maersk Shipping Line and the U.S. Marines in Hawaii have also field-tested the system.

The development work continues. Tsantrizos is downsizing the system to suit commercial vessels with small crews as a step towards his ultimate goal of having a household system. A wastewater processing system has also been developed with the aim of offering a total waste-handling system. Rather than treating potable water as a single use commodity, Tsantrizos believes his technology can reduce current water consumption by 75 percent.

Tsantrizos already holds 18 patents on various technologies used on large cruise ships and aircraft carriers, for biomedical applications, and in the mining and pulp and paper industries. **– *MarEx***