NOTHING WASTED

Sustainable Business Magazine speaks to Peter Tsantrizos, President of Terragon Environmental Technologies Inc., about how they are eliminating waste through the development of compact, clean, user-friendly technologies.

Terragon Environmental Technologies Inc. is a technology development company based in Montreal, Canada, with a focus on waste treatment technologies and a cutting edge philosophy. They are seeking to completely change the way waste is viewed, and as Sustainable Business Magazine finds out, they are already making great headway.

"We have all been trained to think of waste as something unpleasant that we need to send away as quickly as possible," explains Peter Tsantrizos, President of Terragon Environmental Technologies. "Terragon is trying to say no, there are important uses for waste. There is no need to get rid of it." This is why Dr. Tsantrizos is keen to emphasize Terragon is not in the waste management business. Instead their goal is to eliminate the concept of waste altogether through the development of small scale technologies for the onsite conversion of waste into resources. With a background in technology development, waste management, and engineering, Dr. Tsantrizos established Terragon in 2004 to be an organization that would transform the way the existing waste management industry operated. Terragon possesses three technologies in its portfolio: Micro Auto Gasification System (MAGS), for solid waste; Wastewater Electrochemical Treatment Technology (WETT), for liquid waste; and System for Total Environmental Protection (STEP), a platform for integrating MAGS and WETT.

THE GENERATION GAME

MAGS is a revolutionary technology, the first appliance to generate domestically viable levels of energy using only ▶

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combustible waste as fuel. It contains a 55 gallon drum that is loaded up with carbon-based waste, without need for pre-treatment, and the appliance converts waste into a synthesis gas that is then burned for energy. MAGS is a highly efficient converter, able to convert 1 kilogram (kg) of waste into 2 kilowatt hours (kWh) of thermal energy.

MAGS is designed for use on site, within any type of environment or location, meaning its user-friendliness has been a high priority during development. "It can be used by anyone able to operate a washing machine," says Dr. Tsantrizos. "It is very different from anything else on the market because it was developed for use not by waste processors but by the waste generator, locally and on-site. User-operability was one of two main focuses, the other being safety - both environmentally and for the user. In order for it to be useful within an industrial or residential environment, all emissions have been cleansed so that there are no bad smells or discharges."

Aside from its abilities for treating all combustible municipal solid waste, MAGS offers specific advantages for industries producing special or hazardous waste that requires specialized treatment services. By allowing companies to safely treat these waste streams at the source, MAGS can help reduce the risks involved in transporting the waste and at the same time offer them energy for their operations. ▶

WATER

Having made strides in the tackling of solid waste, Terragon has also turned its attention to liquid waste with WETT, which as in the case for MAGS, was developed with the support of Sustainable Development Technology Canada, the Canadian Department of Defence, and the U.S. Navy. WETT is the size of a small refrigerator and uses electrochemical processes to convert used water into useful water. Terragon's approach is based on creating a hierarchy of three categories for water: potable, utility, and irrigation. WETT creates utility water out of grey water, or irrigation water out of black water, thereby closing the water cycle. A small amount of potable water input results in a small amount of irrigation water output, such as into the garden, with the majority remaining within WETT's water loop. Ultimately this will provide between 70% to 90% savings in water.

"We are currently in the testing phase with our first product, which is designed to treat water contaminated with oil such as water from washing tanks," explains Dr. Tsantrizos. "It has been in development for 6 years and we are quite far through the field evaluation now with that product and expect to have it commercially ready by 2016. WETT is designed to eliminate the basic concept of water management as it exists today. The way we use water today - brushing teeth with the same water used to flush our toilet, or showering with the same water used for flowers in the garden - is highly illogical and our technology will change that. It will essentially eliminate the need for sewers and septic tanks."

INTEGRATED TECHNOLOGIES

MAGS and WETT are complementary technologies that Terragon believes can work to create a "zero-waste habitat". STEP is the company's project to integrate the two technologies. Using MAGS results in a small amount of water byproduct; using WETT results in a small amount of organic sludge byproduct. STEP enables MAGS to use WETT's byproduct and vice versa to create an environment where waste is completely eliminated.

STEP is not yet a reality but Terragon is working diligently to realize it as a commercial product. Discussing its development, Dr. Tsantrizos explains how MAGS and WETT technologies are beginning to converge. "Right now both appliances are not on the exact same scale. MAGS has reached the point of being able to utilize waste for up to 500 people, while WETT is designed for 5 to 30 people. We are trying to scale up WETT and scale down MAGS so that we can have a solution for sites ranging from 5 and 500 people, meaning we will have a product useable by everyone from domestic households to industrial facilities."

REDEFINING OUR UNDERSTANDING

Since its foundation in 2004, Terragon has been on a mission to change the way the general public relates to waste products. MAGS and WETT are making clear progress towards creating the zero-waste habitat envisioned by Dr. Tsantrizos and his company, a pursuit driven by understanding that there is a fundamental error in the way that existing waste management protocols function. "All of us have been trained by 100 years of garbage trucks and sewer systems to think of waste as something bad," says Dr. Tsantrizos. "The big problem is that we use only a part of what we buy, of what we consume, and the rest goes into some sort of invisible treatment process where people just take it away and we don't have to care about it. We are trying to change that at the source where people view everything as useful. If we get the message across and deliver the enabling technologies then I believe people will change. For me, that would be an accomplishment worth capping my career with."