

TERRAGON REPORTER



No Waste News

A Message to Our Readers

MARCH 2016

Dear Readers,

Welcome to the 2nd edition of the **Terragon Reporter** – No Waste News. The past quarter has been an eventful one; we are pleased to announce five MAGS sales, and several exciting upcoming projects involving new applications for MAGS™ and WETT™! Additionally, WETT-O has successfully passed applicable marine certification tests and Terragon shall be presenting the concept of the Zero-Waste Ship at Green Marine's 9th annual conference "GreenTech 2016 - Mapping the Future of Sustainable Shipping" in Quebec City on May 31st.

With a new year have come more pressing global concerns for the state of our environment. In the wake of the 2015 United Nations Climate Change Conference, COP21, the international community adopted the first ever universal, legally binding global climate deal aimed at limiting global warming to below 2°C. Canada has publicly endorsed the goal of holding global warming to no more than 1.5°C. As a company mandated to minimize anthropogenic deterioration of the environment, Terragon looks forward to providing solutions for countries dedicated to this important mission.

Join our revolution by sharing and following us on Facebook and LinkedIn and visiting our website.



NEWS



Wasting Canada's GHG Savings Potential

The materials Canadians throw in the trash every day are impacting greenhouse gas (GHG) emissions in a colossal way. Every year, 54 Mt of GHGs are emitted from the waste sector, mainly due to the release of methane from landfills. Methane has a global warming potential 21 times greater than carbon dioxide. At the 2015 Paris Climate conference, Canada endorsed the goal of holding global warming to no more than 1.5°C, a very ambitious objective. Meaning, at the very least, that Canada must surpass the late Conservative

government's target of 30% below 2005 carbon dioxide equivalent levels by 2030. The result: a drop from today's 726 Mt of GHG emissions to at least 512 Mt of GHG in 14 years.

Basically, if Canada removed every single car and truck from the road, every train from the track, and every plane from the sky, we would still be about 25% away from the targeted goal. Clearly, each area of Canada's economy is going to have to cut back drastically; one can practically hear the "what about our economy" groans. However, there is one area where we can significantly affect GHG reductions almost immediately and benefit economically in the short term. It is an area where we are literally throwing away GHG savings potential: the waste sector. If Canada applied a TRU, Total Resource Utilization, model to its waste sector, whereby each waste stream is treated according to maximum recovery potential within the community where it is generated, meaning local reuse, composting, recycling and energy recovery, the entirety of GHG emissions released by landfills could be avoided completely, representing 25% of the current GHG reduction goal.



Local energy recovery from waste is possible through multi-fuel energy generating appliances. Terragon's Micro-Auto Gasification System (MAGS™) offers the possibility of zero discharge, or TRU habitats, playing a complimentary role to reuse, composting and recycling of materials. Even if MAGS simply replaced every Canadian landfill, it would account for 13% of Canada's GHG reduction goal. This amount is equivalent to 51% of emissions from the total GHGs generated by the entire waste sector. MAGS alone improves Canada's GHG footprint in a significant way, but more is needed in the form of a total waste revolution. Other reusable resources Canadians dispose of every day include water; technologies such as WETT allow us to reuse grey water in our homes reducing potable water consumption by up to 85%. We need to take ownership of all our resources to reduce Canada's carbon footprint, water and waste included; it's time to quit throwing away our carbon savings!

UPDATE:

Terragon is proud to announce that **WETT-O™** (Wastewater Electrochemical Treatment Technology for Oily Bilge Water) has successfully passed the marine certification tests for:

- International Maritime Organization MEPC.107(49) regulations;
- DNV No. 2.9 Type Approval Program No. 771.60 5ppm Bilge Water Separators and 5ppm Bilge Alarm; and
- USCG CFR Title 46 (PART 162 Subpart 162.050).

UPCOMING EVENTS:

Terragon shall be presenting at the following conference:

- **GreenTech 2016 Mapping the future of sustainable shipping** (Booth 1) - Quebec City – May 30-June 1

Come and join us at the following conferences where Terragon is participating as an attendee:

- **Canadian Maritime Advisory Council Canada Conference** – Ottawa – April 19-21
- **International Tug, Salvage & OSV Convention and Exhibition** – Boston – May 23-27



Water and Wastewater Management in the Arctic



Water and wastewater management in Arctic communities is a daily challenge. The majority of Arctic communities are off-grid groups ranging from a few hundred to a few thousand people. The water and wastewater management cost in Arctic communities is more than twice that of southern counterparts. Water and wastewater must often be trucked in and out of each dwelling. The capital cost of combined water and wastewater management plants is typically \$68K per household with yearly operating and maintenance costs averaging \$4.7K per household. Such expenses are incurred by the government and can exceed these values for very remote communities. Moreover, the difficulty of effectively managing resources results in a lack of potable water for basic hygiene which poses serious health risks, placing an additional financial burden on the health sector.

In order to reduce water and wastewater management costs, a few greywater (GW) reuse initiatives have been launched in Arctic households and communities geared towards the reuse of treated water for toilet flushing, cleaning, bathing and laundry. However, GW reuse technologies are either biological treatment systems, which take several weeks to become functional and are extremely sensitive to toxic compounds found in GW, or a series of filtration units, which translates to high maintenance and consumables costs.

Terragon's mission to empower Arctic communities in becoming self-sustainable has resulted in the development of two revolutionary Wastewater Electrochemical Treatment Technologies (WETT) which have the potential to significantly reduce water and wastewater management costs:



WETT-G™
Greywater treatment and reuse



WETT-S™
Blackwater (toilet) treatment and reuse

Terragon has conducted a feasibility study in order to assess the potential of using WETT-G in an Arctic community of about 150 people. This feasibility study demonstrates that the use of WETT-G to treat GW generated by the community and the resulting reuse of treated effluent for all non-potable applications, allows the community to reduce potable water consumption by 75% to 85%. WETT-G also serves to attenuate health problems related to water scarcity and better preserve the environment and land while creating jobs in each community related to operation servicing and maintenance.





Cruise Ship Waste Management

It is no surprise that cruise ships generate large amounts of solid waste. With increasing passenger carrying capacity, cruise ship owners are looking for new ways to minimize, repurpose, and utilize waste to generate energy onboard. Terragon's MAGS™ technology will play an important role with existing ships, as well as with the redesign of cruise ships, and changes in overall waste management onboard.

The current ship designs include many different types of pre-processing equipment, such as: digesters, de-watering technologies, shredders, compactors, and typically, two very large incinerators. This is effectively a centralized approach to waste management; a practice commonly used on land. It is not only expensive to install, operate, and maintain; but also requires a large amount of space onboard. Using the MAGS technology, a decentralized approach in combination with other sustainable practices is advised (recycling, repurposing food).

Strategically placed, MAGS units would not only enable the continuous and immediate processing of waste as it is generated – effectively replacing the trash bin – but enable a network of distributed energy generation. The energy can be used in many different ship systems, essentially anywhere hot water is needed. Freeing up the extra space dedicated to large waste processing rooms and incinerator footprints may also enable revenue generation from added state rooms.

