

TECHNOLOGICAL ADVANCEMENTS IN THE WASTE MANAGEMENT SECTOR

Technology has been rapidly rising throughout the recent years however, for the waste management sector there has been a slow uptake on technology and its potential uses within waste management. This is set to change in the upcoming future, as leading figures within the industry are developing various technologies, methods and apps to revolutionize the waste management world and welcome it to the digital age.

Anaerobic Digestion

There are two major issues that we're dealing with across the globe: waste and fuel. Landfills cannot sustain us forever, and the worry about greenhouse gasses has pushed the need for solutions to both problems. With anaerobic digestion, we may have found one answer for both questions. The process sees that waste matter being broken down by microorganisms in an oxygen-lee environment. The remains left over can be used as fertilizer, and the gas it produces is used for energy. The process is an improvement upon previous methods used to create compost from organic waste. The process has the potential to deal with organic waste and providing gas-based energy at the same time. Plus, as humans will always create organic waste, the energy anaerobic digestion creates is classed as renewable energy. The downside is that the technology isn't cheap to run – in order for anaerobic digestion to work on a commercial scale, large tanks and process vessels are required to be invested in.

Enzyme-based solutions

It uses enzymes to convert cooking oil into biodiesel. The process can turn lower grade oils into biodiesel, which in turn, lowers the cost of raw materials for biodiesel producers. As well as converting used cooking oil into raw material, Eversa neutralizes the requirement of sodium methoxide, which is one of the most hazardous chemicals used in biodiesel plants. Removing such hazardous substances is a benefit to both human and environmental safety.

Automated waste collection

The process has an underground network of tubes linking homes and designated outlets to a waste collection centre. People would have a bin for general waste, organic waste, and paper waste, and would sort their rubbish and recycling as is standard today. When the bins reach a certain limit, the bottom would open to “flush” the waste out through vacuum tubes. No more putting the bins out! This system, is already being used at Disney World already, as well as parts of Europe. There are plans to make it more mainstream but it has been held up at points by concerns over larger items of waste not being able to go into the automated waste collection outlets.

Apps

With the rise of the app culture, waste management companies have begun to develop new apps to help businesses and residents address their waste in a more efficient, environmentally friendly manner.

Robotic helpers

Waste companies are making infrastructure improvements that take advantage of the advancement of automation technologies, with advanced robotics and machine learning allowing for enhanced collection efficiency and improved sorting capabilities at recycling plants. Already, [Dubai's Al Mamzar area is enjoying the benefits of enhanced vehicles](#) that automatically pick up and empty bins from either side of the road and then automatically clean and sterilise the containers before putting them back in place.

As the Internet of Things (IoT) approach allows for the increasingly fluid connection of multiple systems, even the complicated legacy issues affecting larger waste management companies can be overcome, allowing for the integration of revolutionary automation technologies.

Drones are also playing an increasingly important role in the solid waste industry, not only by monitoring and assessing landfill sites more efficiently than can be done on foot, they're also seeing more frequent use in detecting radiation and air quality levels. In Dubai, drones are now an established means of [finding unauthorised waste dumping hotspots in the desert](#) and tagging offender cars for the serving of future warnings or, ultimately, fines.

Closing the loop: Recent estimates suggest that changing the currently "linear" supply chain models associated with waste (extract/produce, consume, collect, deposit in landfill) into circular supply chains (manufacturing, consumption, collection, sortation, processing, all within a continuous loop) [could quickly become a \\$2 trillion opportunity in the US alone by 2030](#). Already, efforts from the US's Closed Loop Fund – designed to help municipalities adopt this model of waste management – have allowed for 250,000 tonnes of waste to be diverted from landfill, saving 600,00 metric tonnes of CO2 emissions.

Successfully sorting out waste: The pace of change is quick in many regions of the global waste management industry as service providers and national governments both realize that the antiquated landfill system is no longer in a tenable position to hold to in an age where environmental concerns demand a more efficient and sustainable answer. This, coupled with the significant cost benefits offered by improving operations through emerging technology integration, is quickly encouraging waste management companies of all sizes to reassess their operational setup and look for opportunities to adopt a more technological approach.

Source:

<https://www.recycling-magazine.com/2018/11/29/technological-advancements-in-the-waste-management-sector%E2%80%A8/>

<https://www.worldfutureenergysummit.com/wfes-insights/tackling-waste-through-technology-global-advances-in-implementing-smarter-waste-management#/>