



Cutting infections and emissions in the developing world

How do you stop 21 million people from contracting Hepatitis B? Dispose of medical waste safely.



The World Health Organisation estimates that in 2000, injections with contaminated syringes caused not only 21 million hepatitis B virus (HBV) infections worldwide, but also two million cases of hepatitis C and 260,000 of HIV mainly in African, Asian and Eastern European countries. That means that mismanaged medical waste accounts for 40% of new cases of Hepatitis C alone every year.

Athisa wants to change all that. The Spanish company was the lead partner in EUREKA OMIM project, which just won the 2013 EUREKA Innovation Award. 'Inadequate treatment of infectious waste like contaminated needles results in the presence of residues in landfills where people may become infected,' says Omar Fernandez Sanfrancisco, R&D Project Manager at Athisa.

The MIMO medical waste treatment system developed via the OMIM project, handles three types of medical waste: Infectious wastes like blood, microbiological cultures and sharps (needles, syringes, scalpels); residues from cancer treatment (cytostatic waste) which can affect DNA, and non-cytostatic pharmaceutical waste like expired medicines. 'The great advantage of the MIMO system is its

A better medical waste system

Incineration and alternatives like autoclaving, which treats infectious wastes by applying a combination of heat and pressure), have problems. 'Incineration and autoclaving require a high consumption of fossil fuels to operate,' explains Sanfrancisco. 'MIMO is a Clean Development Mechanism in accordance with Article 12 of the

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ability to treat all three types of wastes,' says Sanfrancisco. 'Incineration is the only other technology that can address these three types of medical waste. Infectious waste is the most common type and incineration is the most common method to treat it.'

Kyoto Protocol. No fossil fuel is needed for its operation; it runs on electricity.' Because of the high construction cost of an incineration or autoclaving unit, treatment tends to be carried out at centralised locations, resulting in additional fossil fuels being used for transport. In Spain, for example, there are only two incineration plants in the



entire country. Incinerators may also emit dioxins and furans, identified by WHO as carcinogens, into the atmosphere.

So how does the new technology work? The MIMO SYSTEM uses a combination of physical and chemical treatment of medical waste. First, the waste is shredded and milled. Then the waste is exposed to different oxidants (a substance that removes electrons from certain molecules) to destroy pathogenic microorganisms in infectious waste, or organic molecules in cytostatic and non-cytostatic pharmaceutical wastes.

The oxidation process is specific to each category of medical waste, but the same machine is capable of processing infectious, cytostatic and

A solution for emerging countries

The MIMO SYSTEM is particularly suitable for use in emerging countries. 'The first plant is being built in Casablanca, Morocco where we already have contracts with the pharmaceutical industry,' says Sanfrancisco. 'We also have a preliminary agreement with the Turkish environmental authorities to implement the technology there.' It costs 75% less to build a MIMO SYSTEM plant than a hazardous waste incinerator and the operating cost is 50% lower. The MIMO SYSTEM can also process 3000 Kg of hazardous waste per hour, four times the maximum yield of an incinerator. The system uses mechanical elements and chemical reagents that are easily available in any country and can be managed by operators trained in the local country.

a big factor in the project's success.'

The MIMO SYSTEM is already generating significant revenue. Vietnam and Algeria are the next target markets after Turkey and Morocco. 'EUREKA was an excellent showcase of the project, facilitating the internationalization of the technology. The EUREKA label is a certification of quality for any R&D project and that significantly improves the chances of implementation.'

The collaboration between three companies based in Spain, Portugal and Morocco was a big factor in the project's success.



non-cytostatic pharmaceutical waste. Finally, the residue is stabilised before its transfer to landfill. Stabilisation converts any remaining molecules into their least soluble form thereby preventing leachates, liquids containing elevated concentrations of undesirable material, from draining into landfill.

The involvement of Morocco in EUREKA project 3728 was a big selling point for Athisa. 'EUREKA is not only an effective forum for knowledge transfer and innovation support, but the collaboration between three companies based in Spain, Portugal and Morocco was especially attractive for us and was

Project participants:
Spain, Morocco, Portugal

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