

Development of Non-Burn Medical Waste Disposal Technology

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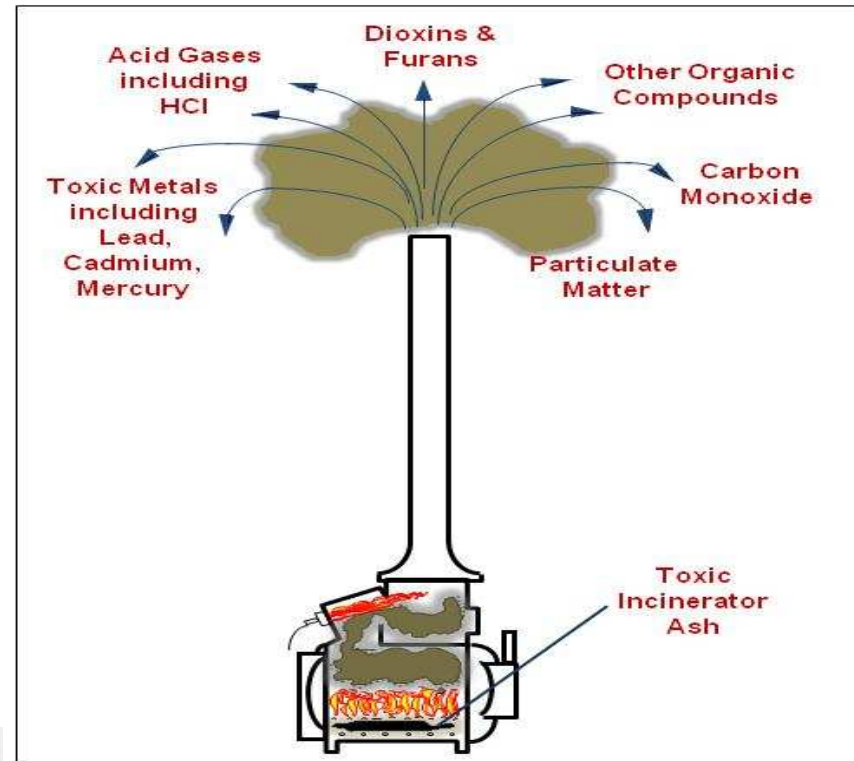
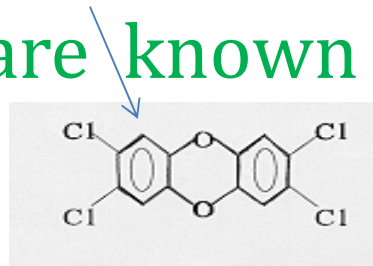
Global Environmental Fund/UNDP

Background

- Since 2009 the CoET of UDSM under the sponsorship of GEF/UNDP have been implementing a project called *“Demonstrating and Promoting Best Techniques and Practices for Reducing Health Care Waste to Avoid Environmental Releases of **Dioxins and Mercury.**”*
- The project is undertaken in eight countries including Argentina, India, Latvia, Lebanon, Philippines, Senegal, Tanzania and Vietnam.

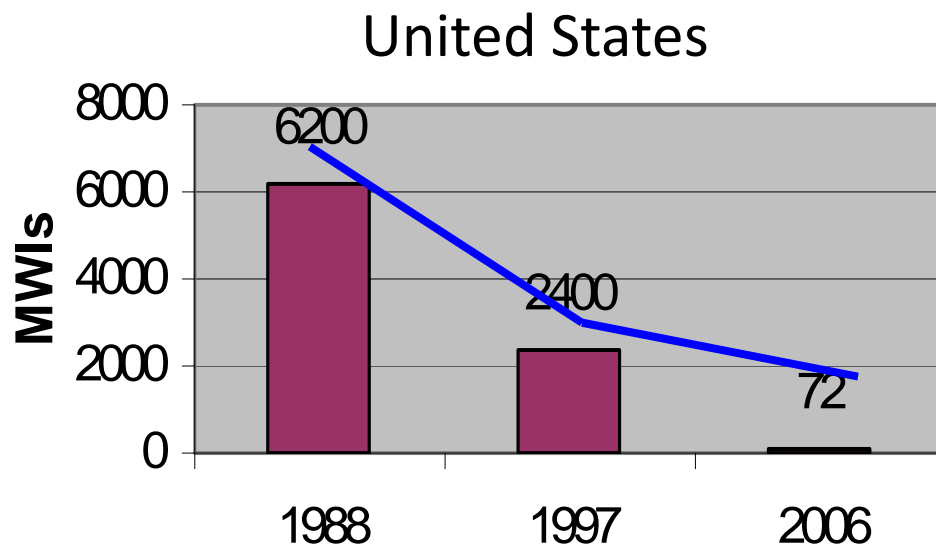
Objectives

The objective of the project development of low-cost, non-burn technologies which does not use the incineration option associated with the release of **dioxins** and **furans** which are known **carcinogens**



Objectives

- From more than 6,200 medical waste incinerators in USA in 1988 only 70 are operation today.



Methodology

- The technology is suitable for developing countries like Tanzania. It has been designed and fabricated at the College of Engineering and Technology, University of Dar es Salaam.
- It has been tested at Muhimbili and CCBRT Hospitals.
- It is currently being disseminated and transferred to mass producers in Tanzania and Senegal.

Methodology



Horizontal Autoclave

Diameter: 540 mm
Length: 1200 mm



Testing at Muhimbili Hospital

External Boiler 9 kW
Volume: 275 L
Level sight glass
Ergonomic

Methodology



Waste compactor

Hydraulic motor: 1.5 kW
Pressure: 3 tons



Waste container

Material: Aluminum
Volume: 30 L

Needle Remover



Results and Discussions

- It consists of four equipment which include an autoclave, a needle remover, waste container bins and a compactor.
- The technology cuts high costs of running incinerators and is suitable for District hospitals with 30-100 beds.
- The autoclave can use electricity or CNG gas. After treatment, the volume of the waste is reduced by a compactor and baler to inhibit scavenging in landfills

Results and Discussions

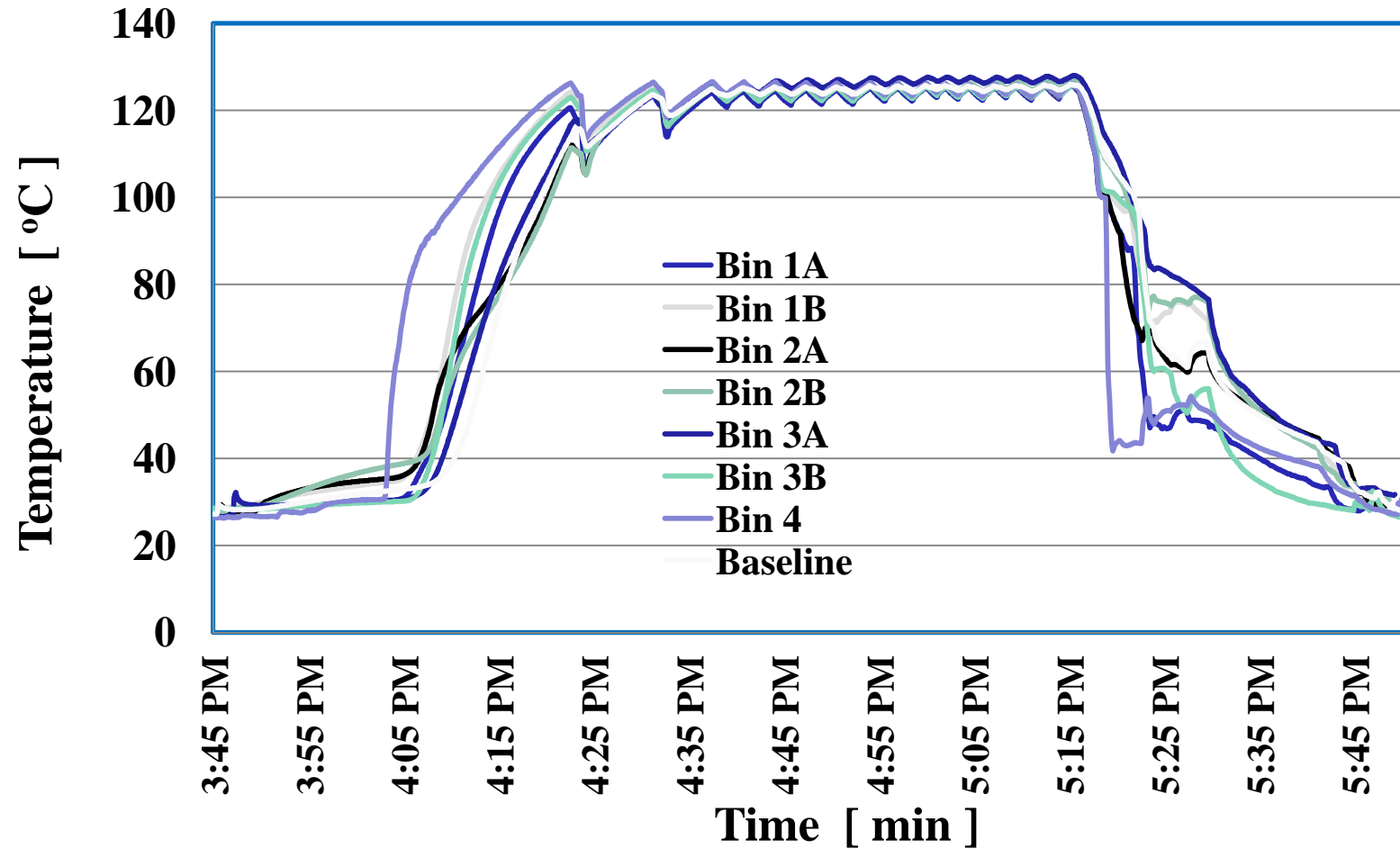
- Hospital waste is usually segregated to infectious (yellow), highly infectious (red), and regular waste (black).
- All infectious waste is autoclaved at 121 °C for 30 mins to kill pathogens and damage viruses.
- The autoclave achieved a log 4 kill of *stereothermophilus* bacteria spores.

Biological Indicators
shows 6 Log kill is —————>
achieved



Results and Discussions ...

Temperature Profile Inside the Autoclave



Conclusions

- The technology for medical waste disposal for developing countries has been successfully innovated at the University of Dar es Salaam.
- The technology is ready for use and is being demonstrated and promoted in local hospitals.
- The technology will be transferred to manufacturers in Senegal and Tanzania.

Acknowledgements

- The University of Dar es Salaam would like to acknowledge generous support GEF/UNDP on the project and the close collaboration of its various experts.
- The University also wish to thank the cooperation of CCBRT and Muhimbili Hospitals for testing and demonstrating the equipment.