Tools for setting up a sound healthcare waste management system

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WHO definition of a safe injection

A safe injection:

- *does not harm the recipient,*
- *does not expose the provider to any avoidable risks and*
- ***does not result in waste that is dangerous for the community***

Implications of the new WHO policy for waste management

Positive outcomes

- Reduced trade in second hand syringes
- Reduced NSI in waste workers and healthcare workers

Potentially negative outcomes

- Mixed materials in new designs may hamper recycling
- We must not become complacent about the risks from sharps waste

The UNDP/GEF Global Healthcare Waste Project

- demonstrated and promoted the use of best practices and techniques for healthcare waste management in 7 countries : ***Argentina, India, Latvia, Lebanon, Philippines, Senegal, (Tanzania) and Vietnam***

Examples of Non-Incineration Technologies Demonstrated by the GEF/UNDP Project in Different Countries

- **Autoclave technologies**
  - Autoclave and shredder – Senegal, Vietnam, Philippines
  - Very large autoclave (5 tonnes/day) and compactor - Vietnam
- **Advanced hybrid autoclave systems**
  - Hybrid autoclave with internal shredding - Lebanon
  - Rotating autoclave – Latvia
- **Microwave technologies** - Latvia
- **Alkaline hydrolysis technology for anatomical waste** - Latvia

Vietnam: large autoclave

Lebanon:
hybrid autoclave

Latvia: rotating autoclave

Latvia: microwave

New affordable non-incineration technology now available for Africa- already installed in Ebola Treatment Units

- Multiple vacuum autoclave with sterilization at 134 deg C
- Manufactured by Medi-Clave Pty Ltd (Pretoria, RSA)
- Developed in collaboration with the GEF/UNDP Project
- 175 liters per cycle, 1 to 1.5 hours per cycle
- Dimensions: 1.1m x 1.5m x 2m high
- Certified to meet or exceed international autoclave standards (ASME, STAATT)
- Includes boiler, all stainless steel construction
- Easy sliding door
- Special trolley with barrel to collect waste; the whole barrel slides into the autoclave to be sterilized

- Vulnerable electronics replaced with mechanical controls
- After treatment, the barrel can rotate to dump out treated waste

www.medi-clave.co.za

1

Place waste inside stainless steel barrel and close the lid

2

When barrel is full, take to autoclave

3

Slide barrel into autoclave

4

Close sliding door

5

Start heating, multi-vacuum and sterilization cycles

6

When finished, open door and remove sterilized barrel

7

Unlock & rotate barrel to dump treated waste at the bottom

8

Barrel and trolley are ready to pick up more waste

UNDP GEF Resources

- Individualized Rapid Assessment Tool (I-RAT)
- Guidance on Conducting a Baseline Assessment of a Healthcare Facility
- Recommended Elements of a Model Facility Policy on Healthcare Waste Management
- Guidance on Microbiological Challenge Testing for Medical Waste Autoclaves

Many more at gefmedwaste.org

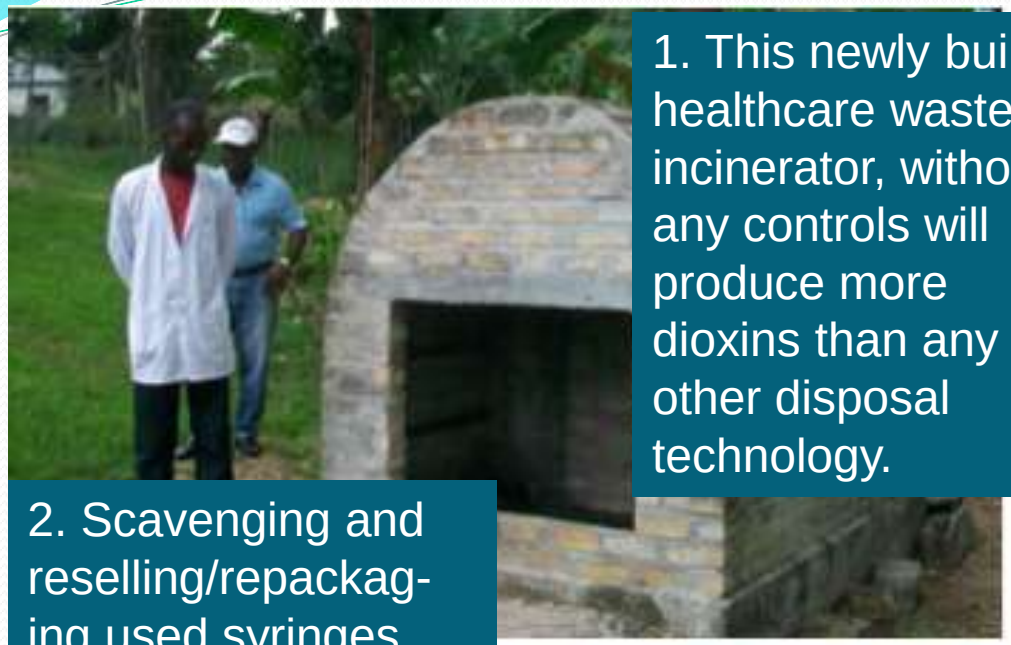
GEF/UNDP/WHO project:

Reducing UPOPs and Mercury Releases from the Health Sector in Africa

Ghana, Madagascar, Tanzania and Zambia

World Health Organization

Health Care Without Harm



1. This newly build healthcare waste incinerator, without any controls will produce more dioxins than any other disposal technology.

2. Scavenging and reselling/repackag-ing used syringes and other medical waste is not uncommon in many countries.

3. Healthcare services and vaccination campaigns generate large amount of syringes which need to be treated before disposal while their plastics could be recycled.

4. Packing healthcare waste in boxes, burying them in a pit and subsequently burning the waste is a common practices when no affordable alternatives are available.

The project will address global environmental problems

(which is why it is eligible for GEF funding)

- Support African countries meet their obligation under the Stockholm Convention (www.pops.int)
- *Reduce releases of dioxins to the global environment*
- Help reduce the use of mercury in healthcare in support of the future Minamata Convention
- *Reduce releases of mercury to the global environment*

The Global Environment Facility (GEF) in 2014 approved the project to start early 2015

The objective of the proposed project is to work with the healthcare sectors in Ghana, Madagascar, Tanzania and Zambia, to:

1. Implement best environmental practices for waste segregation and management including non-incineration waste treatment technologies and to eliminate mercury-containing medical devices to prevent mercury contamination of waste.
2. Ensure the availability and affordability of non-incineration waste treatment technologies in the region.

The project will have significant positive health effects for **patients**, **health workers** (doctors, nurses, dentists), **waste handlers**, **local and global communities**, among others:

Toxin or Pathogen	Originates from	Health Effects
Dioxins	• Burning of medical waste in the open • Burning of medical waste in low-technology incinerators	• Cancer of soft tissues, lung, liver and stomach • Birth defects • Reproductive disorders
Mercury	• Broken Mercury containing thermometers and sphygmomanometers, Hg containing laboratory chemicals, etc.	• Damage to the brain, nervous system and kidneys • Developmental disorders; • Lower IQ
HIV, Hep. B & C and other pathogens	• Inadequate disposal, handling and reuse/recycling of contaminated syringes and other waste items	• 21 million Hep. B infections • 2 million Hep. C infections • 260,000 HIV infections globally (WHO, 2000)

Please take a little time to watch the videos on the GEF-UNDP-WHO-HCWM project, it's an excellent way to quickly learn and understand the scope of these type of GEF funded projects.

UNDP/WHO/HCWH GEF project on healthcare waste management: Uttar Pradesh and Tamil Nadu, Indiahttp://www.youtube.com/watch?v=_srhFLz17SU&feature=youtu.be

GEF/POPs documentary which highlights the UNDP/WHO/HCWH GEF project on HCWM in Tanzania (@ 16 minutes) http://www.youtube.com/watch?v=d_AXY2N4ZwY&feature=youtu.be

Costs and carbon footprints of different immunisation waste treatment technologies

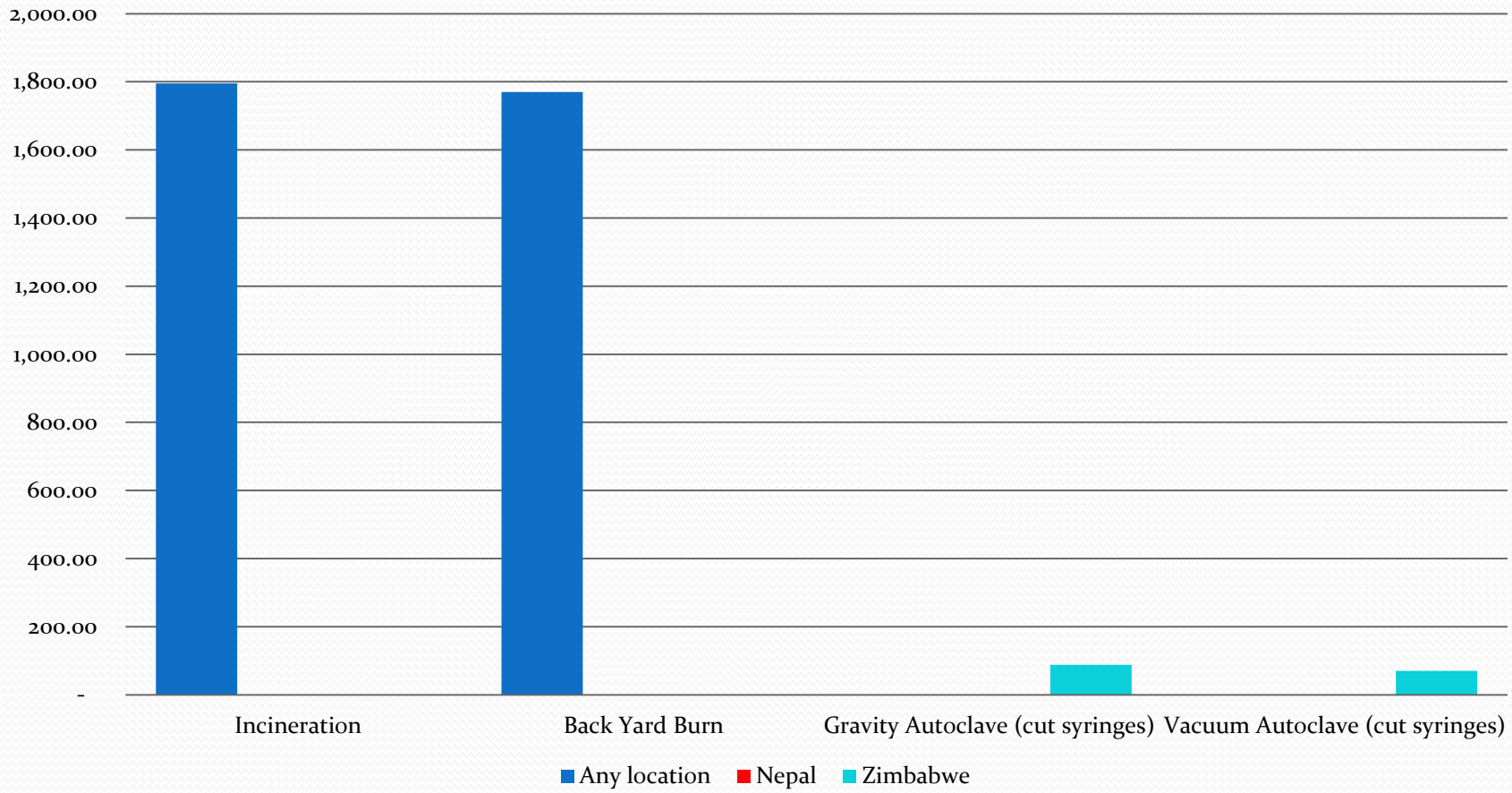
1. Cut needles
2. Segregate waste
3. Collection for treatment
4. Autoclaving
5. Recycling
6. Safe disposal of non-recyclable materials

Funded by a grant from the Bill and Melinda Gates Foundation through the Grand Challenges Initiative

Simple segregation equipment

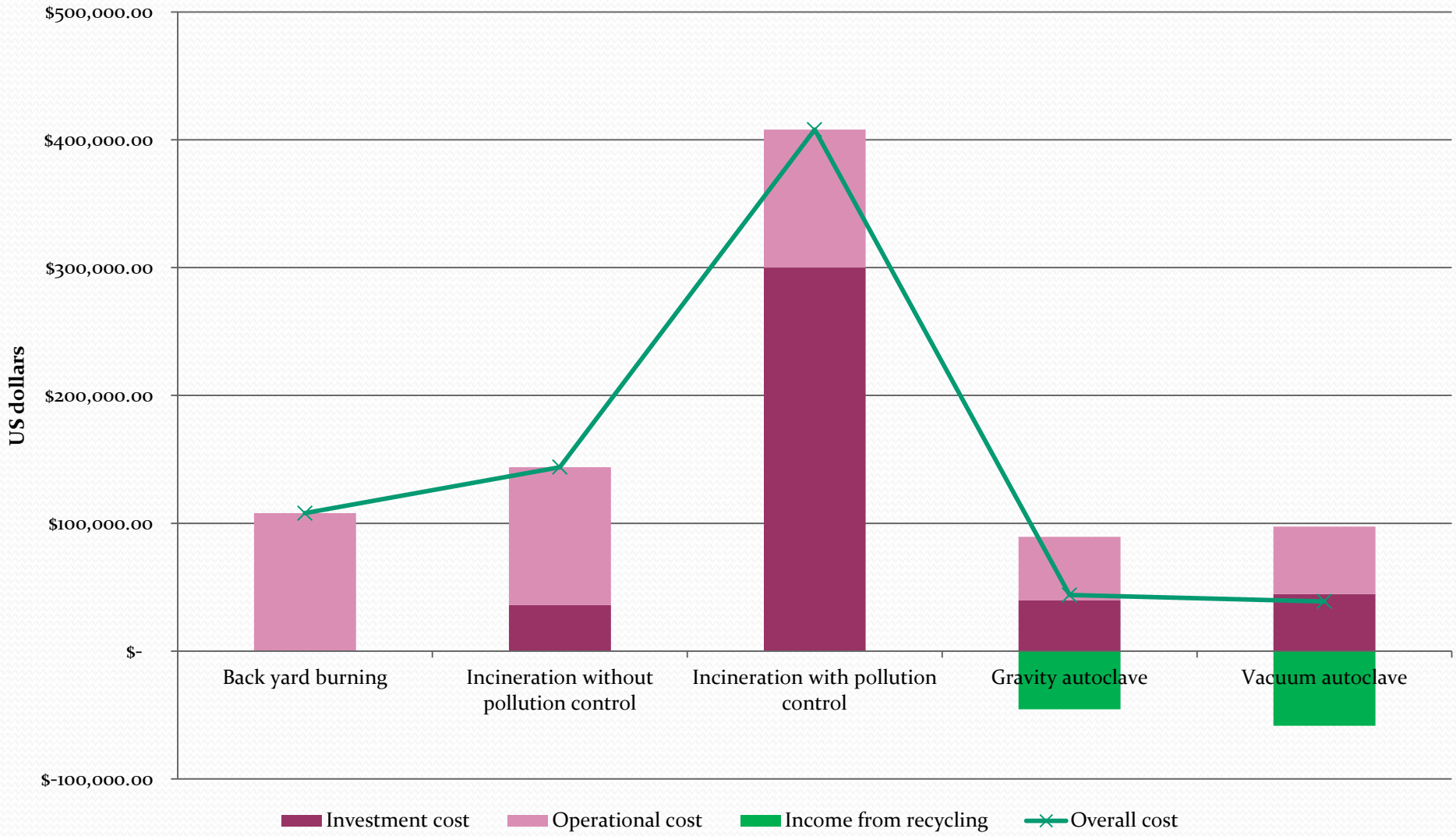
Autoclaving immunisation waste- reusable high capacity sharps bins

Carbon footprint of different disposal technologies



Note- Nepal mostly generates its power from hydroelectric sources, so the carbon footprint of grid electricity is very low in comparison to most countries. Zimbabwe is more typical.

Costs over 5 years



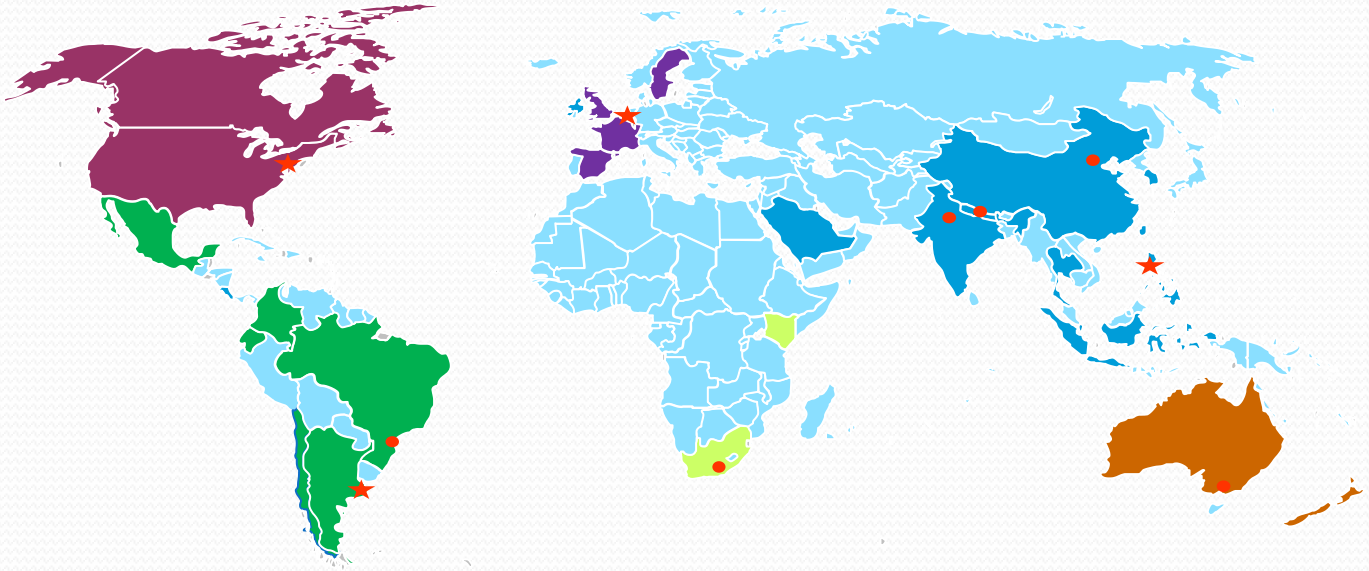
Benefits of new system

- Fewer needle stick injuries
- Less smog in the city
- Cleaner and more pleasant environment
- Reduced carbon footprint
- Saved resources
- Cheaper than incineration
- Resources saved by recycling
- *Reuse prevention syringes recyclable in this instance*

Global Green and Healthy Hospitals (GGHH)

A worldwide community…

- of hospitals, healthcare systems and organizations
- dedicated to reducing the ecological footprint of healthcare operations
- while promoting environmental and public health in their communities



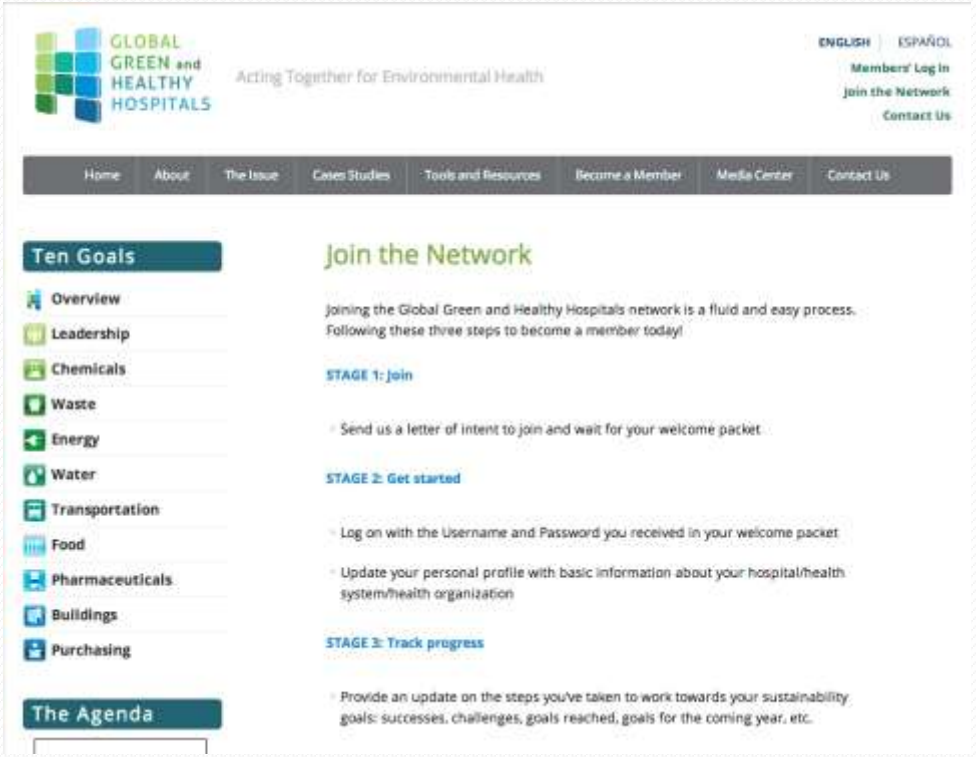
Joining GGHH

Only Health Care members

- Hospitals
- Health Systems
- Health Care Organizations

Member request on website:

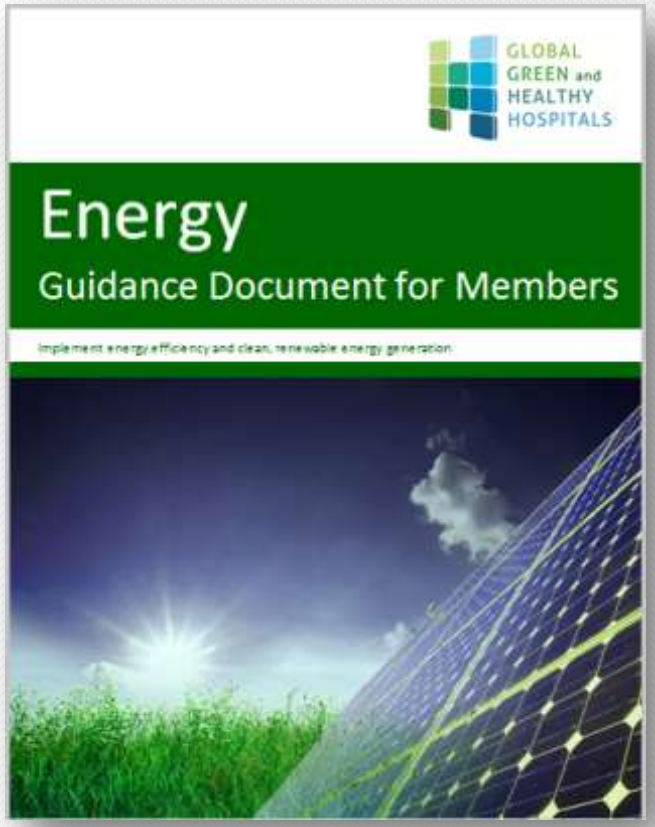
www.greenhospitals.net



GGHH Connect - Tools and Resources

Guidance Documents

- Overview of each goal
- Suggested action items and projects
- Strategies and tips for implementation
- Additional resources for learning/research
- Resources listings including new CDC tools for waste managers in low income countries



Metrics

- Web-based survey of member waste data
- Track progress year after year
- Will benchmark members against sector norms

Waste guidance documents and metrics to be launched April 2015

Healthcare Waste Treatment Technologies Database

Health Care Without Harm

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The alternatives database is a web tool, developed by the Health Care Without Harm Global Team, to help staff responsible for procuring healthcare waste treatment technologies to identify alternatives to incinerators.

Search the Medical Waste Devices Database

Select Country | Select Technology | Select Capacity kg/h

Advanced Treatment System

Designed for healthcare waste

+ Search options

Search

www.medwastealternatives.org

Medwastealternatives.org

Technologies included:

- Autoclaves
- Microwaves
- Dry and frictional heaters
- Hybrid technologies
- Chemical disinfection
  - Selected disinfectants
- Alkaline hydrolysis
- Syringe and needle destroyers
- Grinders, shredders
- Bottle and vial crushers

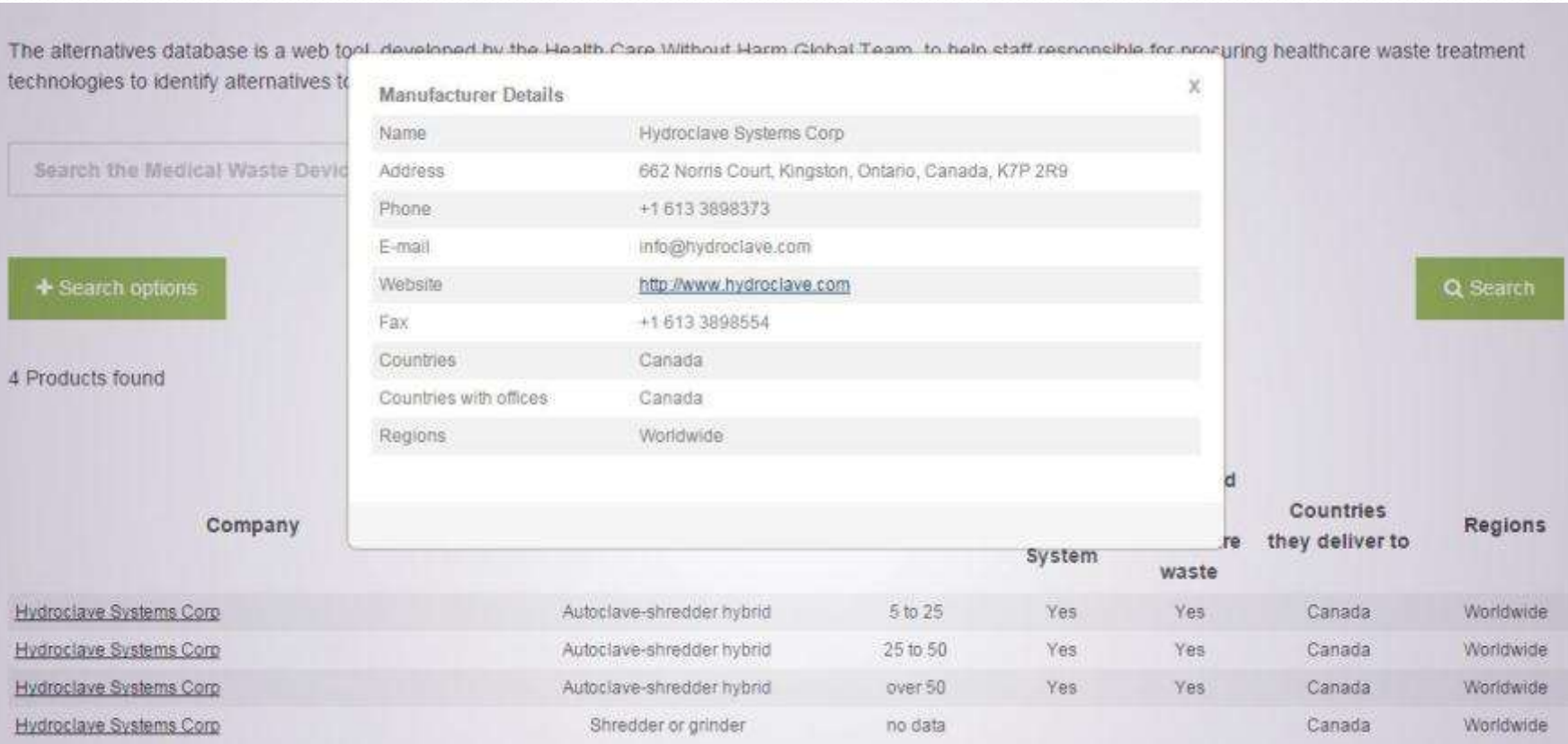
Searchable by:

- Company
- Technology
- Location
- Capacity
- Whether dedicated for healthcare waste
- Level of sophistication

- Contact form for information updates at

http://medwastealternatives.org/contact-us

Simple search results, showing manufacturer details



Advanced search results- prioritised by:

1) companies with an office in target country;
2) delivering to that country;
3) companies delivering to the region or worldwide.

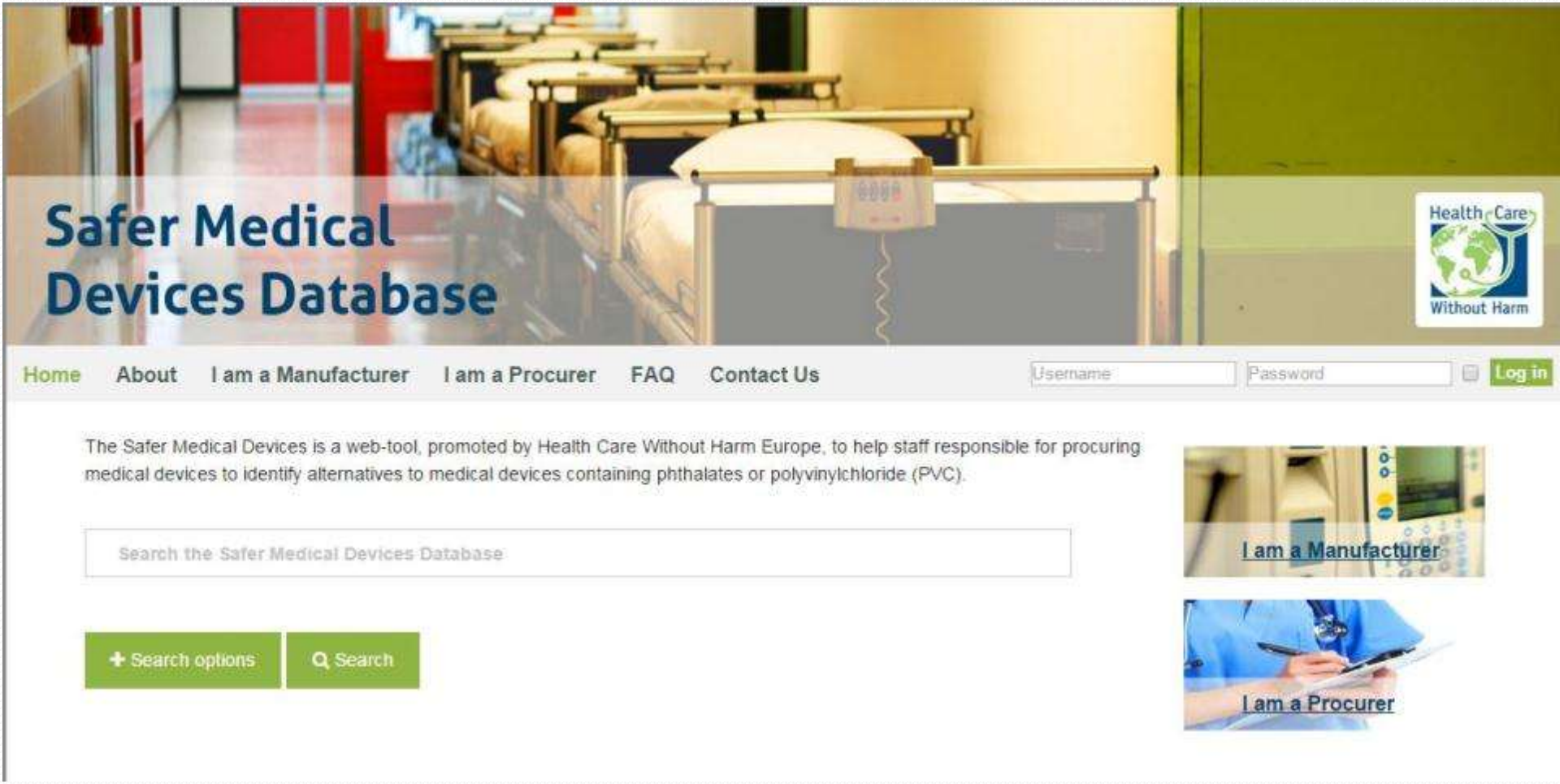
Country: Afghanistan

Company	Technology	Capacity kg/h	Advanced Treatment System	Designed for healthcare waste	Countries they deliver to	Regions
Bertin technologies	Microwave-shredder hybrid	25 to 50	Yes	Yes	Afghanistan, Algeria ...	Worldwide
Bertin technologies	Microwave-shredder hybrid	over 50	Yes	Yes	Afghanistan, Algeria ...	Worldwide

Worldwide

Company	Technology	Capacity kg/h	Advanced Treatment System	Designed for healthcare waste	Countries they deliver to	Regions
Ecosteryl AMB	Microwave-shredder hybrid	over 50	Yes	Yes	Belgium	Worldwide

DEHP and PVC-free medical devices Database of European products



Thank you

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