Hospital Waste Management Policy and Practices

Session IV – Challenges and Trends in Health Promoting Hospital
"Eco-Friendly Hospitals for a Sustainable World"
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Griffith University, Nathan Campus

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Healthcare Waste

Examples of Healthcare Waste

Category	Examples
INFECTIOUS WASTE	Laboratory cultures, waste from isolation wards, tissues (swabs), materials or equipment that have been in contact with infected persons, excreta.
PATHOLOGICAL WASTE	Body parts, blood, and other body fluids, and fetuses.
SHARPS	Needles, infusion sets, scalpels, blades, knives, bro-ken glass, and broken plastic.
PHARMACEUTICAL WASTE	Pharmaceuticals that have expired or that are no longer needed, and bottles or boxes contaminated by or containing pharmaceuticals.
GENOTOXIC WASTE	Waste containing cytotoxic drugs often used in cancer therapy, and waste containing genotoxic chemicals. Genotoxic waste is highly dangerous and may contain mutagenic, teratogenic, or carcinogenic properties.
CHEMICAL WASTE	Laboratory reagents, photographic chemicals, and disinfectants that are expired or no longer needed, solvents. Health care facility chemical waste may be similar to conventional hazardous industrial waste in that they may be toxic, corrosive, flammable, and reactive. Some chemicals typically used at health care facilities include formaldehyde, photographic chemicals, solvents, and other chemicals.
WASTE WITH HIGH CONCENTRATIONS OF HEAVY METALS	These materials can be highly toxic such as is the case with waste with high concentrations of mercury including batteries, broken thermometers, blood pressure gauges, etc.
PRESSURIZED CONTAINERS	Many different types of gas are used in health care. These gases are often stored in pressurized containers such as cylinders, cartridges, and aerosol cans. The containers themselves must be handled carefully since they may explode if incinerated or accidentally punctured during handling.
RADIOACTIVE WASTE	Unused liquids from radiotherapy and laboratory research, contaminated glassware, packages or absorbent paper. Urine or excreta from patients treated, or tested with unsealed radionuclides, and sealed radionuclide sources.

Healthcare waste

Hazardous health-care waste

- 75 - 90% of general waste (similar to domestic waste)
- 10 - 25% is hazardous (infectious, toxic etc.)

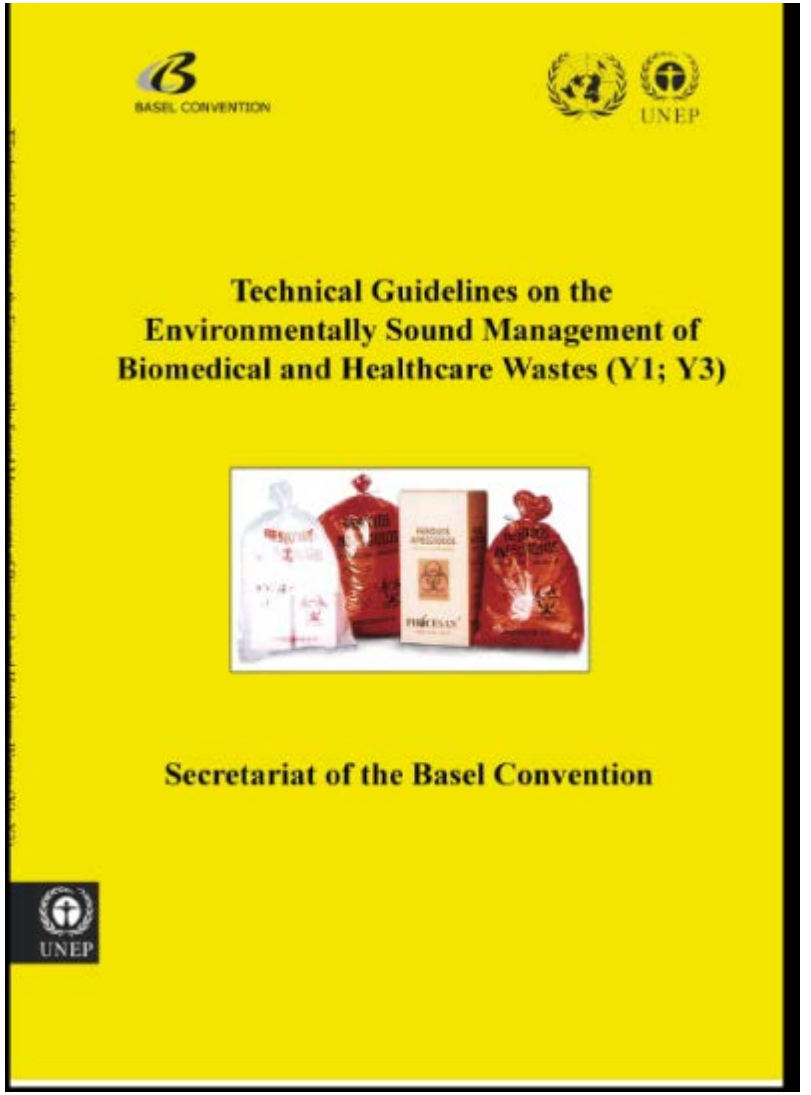
Why does this Waste Matter?

- Sharps injuries may harm workers and communities
- Medical waste potentially impacts patients, workers, community, and economy because of the volume and permanence of waste

Impacts of healthcare waste

- Contain infectious organisms, including drug resistant ones
- Place cancer causing agents into air or ground water
- Cause radiation-related illnesses
- Contribute to global warming harm atmosphere (CFC containing refrigerant gas)
- Cause injury (sharps, explosion)
- Cause congenital defects or stillbirth, prematurity, infertility

Health Care Waste Management Resources



Action Plan for a National Programme

- Ensure policy commitment and designate responsibilities
- Conduct a national survey of health-care waste management
- Develop national guidelines
- Formulate a strategy on health-care waste management
- Develop common treatment policies
- Establish legislation and standards
- Develop and implement a national training programme
- Review the implemented national programme

Source: WHO

Health Care Waste Strategy

- Public health safeguarded
- A comprehensive understanding of the status of health care waste management
- Sufficient funding secured annually for the management and disposal of health care wastes
- Skilled and experienced Pacific islanders actively engaged in all facets of health care waste management
- Economically sustainable and environmentally sensitive disposal of health care wastes

Aim of Treatment and Disposal

- **Limit public health and environment impacts by** transforming the waste into non-hazardous residues by treatment
- Containing the waste/ residues to avoid human exposure
- Containing the waste/ residues to avoid dispersion into the environment.

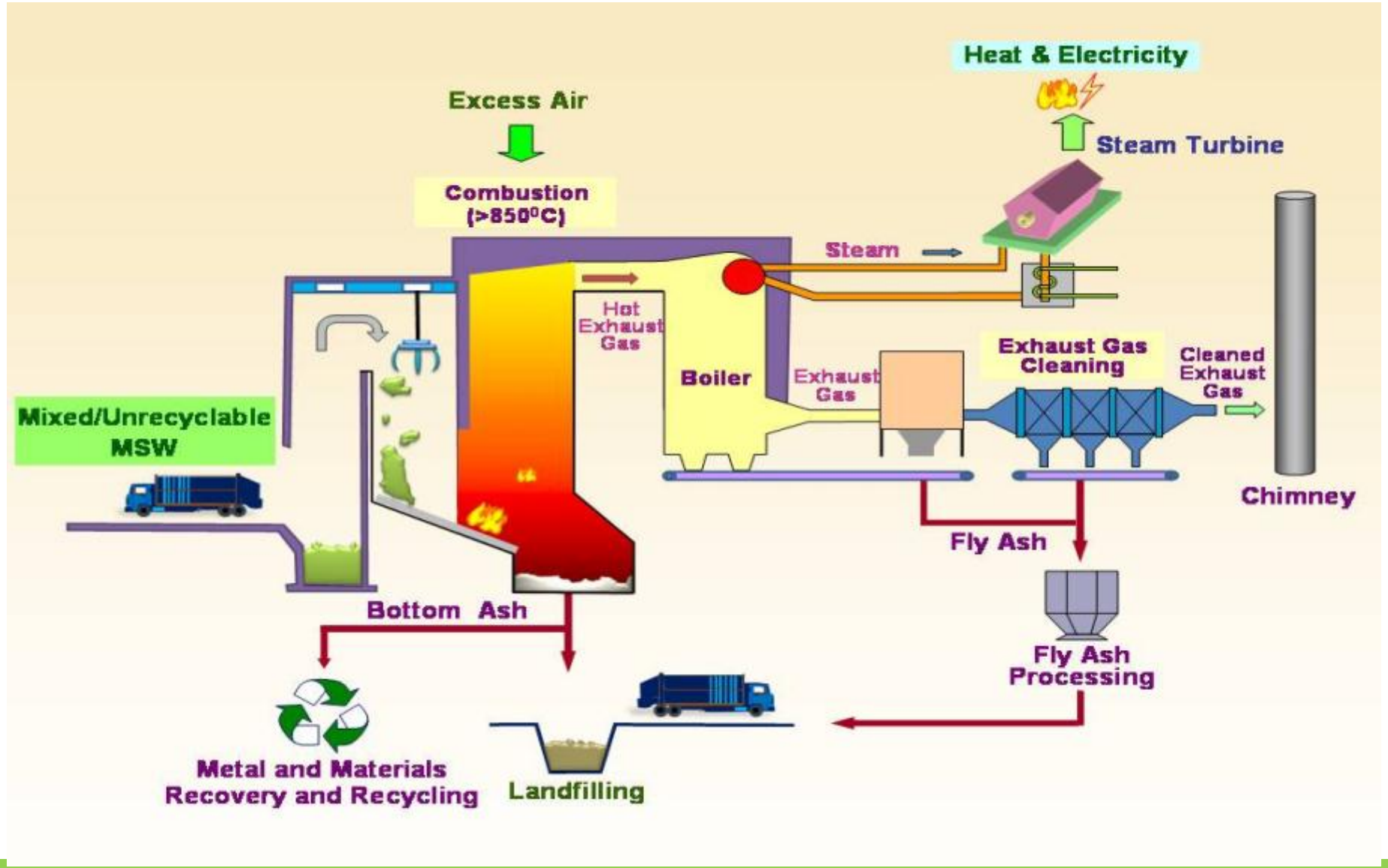
Treatment and Disposal Options

Treatment

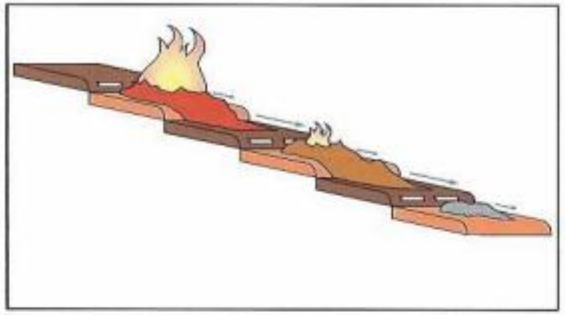
- Incineration
- Chemical disinfection
- Autoclaving
- Encapsulation
- Microwave irradiation

Final disposal

- Municipal landfill
- Burying inside premises

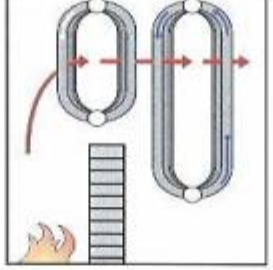

Heat & Electricity
Excess Air
Steam Turbine
Combustion
(>850°C)
Steam
Hot
Exhaust
Gas
Boiler
Exhaust
Gas
Exhaust Gas
Cleaning
Cleaned
Exhaust
Gas
Mixed/Unrecyclable
MSW
Chimney
Fly Ash
Bottom Ash
Fly Ash
Processing
Metal and Materials
Recovery and Recycling
Landfilling

The Waste-to-Energy Process



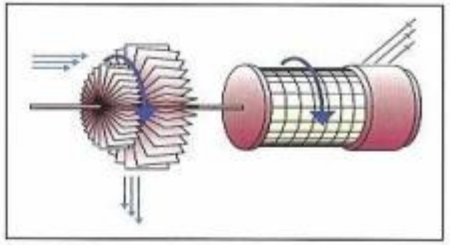
COMBUSTION GRATE

Inclined reciprocating grate systems move the burning waste at specific rates through the furnace, ensuring complete combustion and maximum energy recovery.



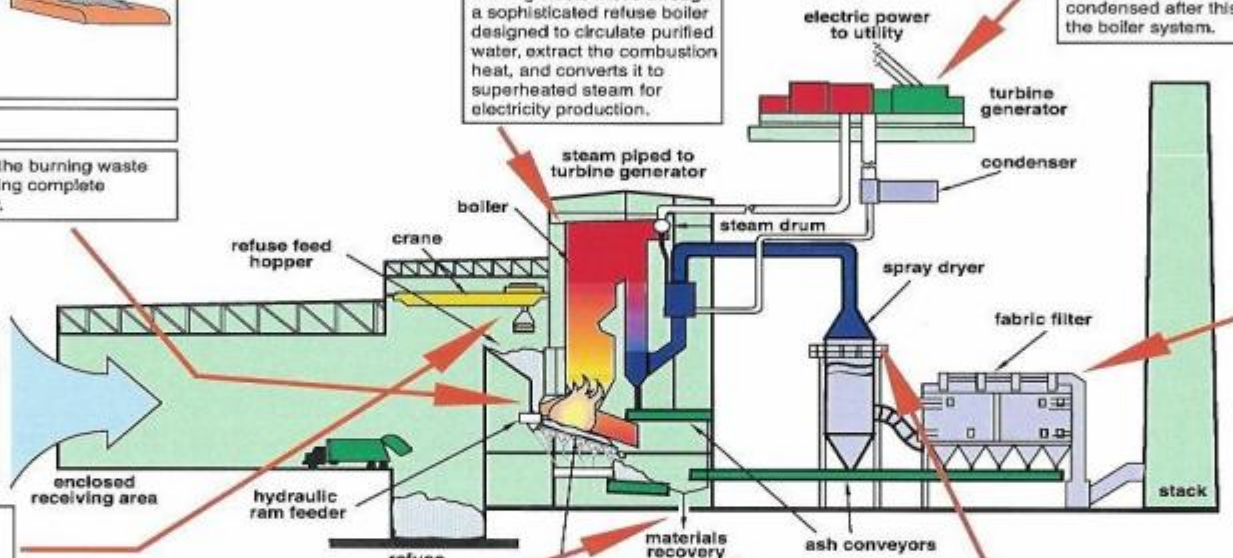
BOILER

Combustion gases from the burning waste move through a sophisticated refuse boiler designed to circulate purified water, extract the combustion heat, and converts it to superheated steam for electricity production.



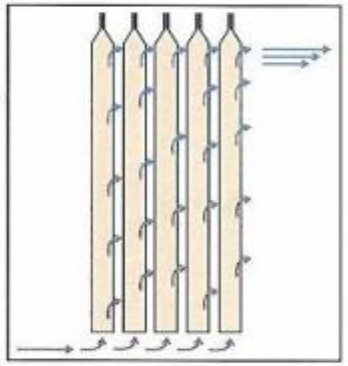
TURBINE-GENERATOR

High-speed precision turbine blades, driven by the high-pressure steam from the boiler, drive a generator to produce electricity. Water condensed after this process is recirculated to the boiler system.



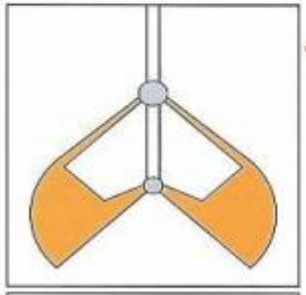
NEGATIVE AIR PRESURE

The plant's combustion air is drawn from the enclosed receiving area and refuse fuel pit, maintaining a negative air pressure that controls the release of dust and odors.



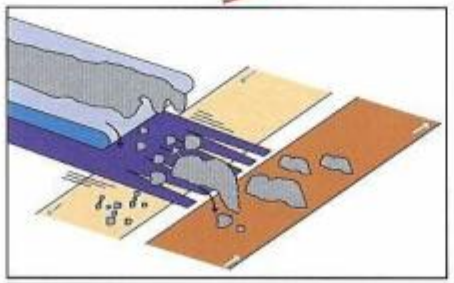
FABRIC FILTER (BAGHOUSE)

Hundreds of Teflon® fabric tubes filter more than 99.9% of the particulate material from the combustion flue gases. The filtered ash is recovered and safely disposed.



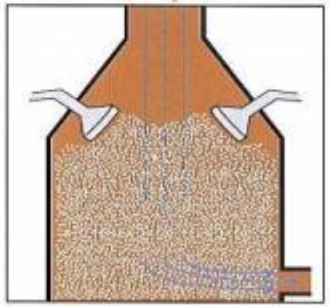
CRANE

Hydraulic refuse cranes mix and load the incoming waste, depositing it into hoppers that feed the plant combustion systems.



MATERIALS RECOVERY

The inert combustion ash residue is size and magnetically separated after combustion, enabling efficient metal recovery for recycling.



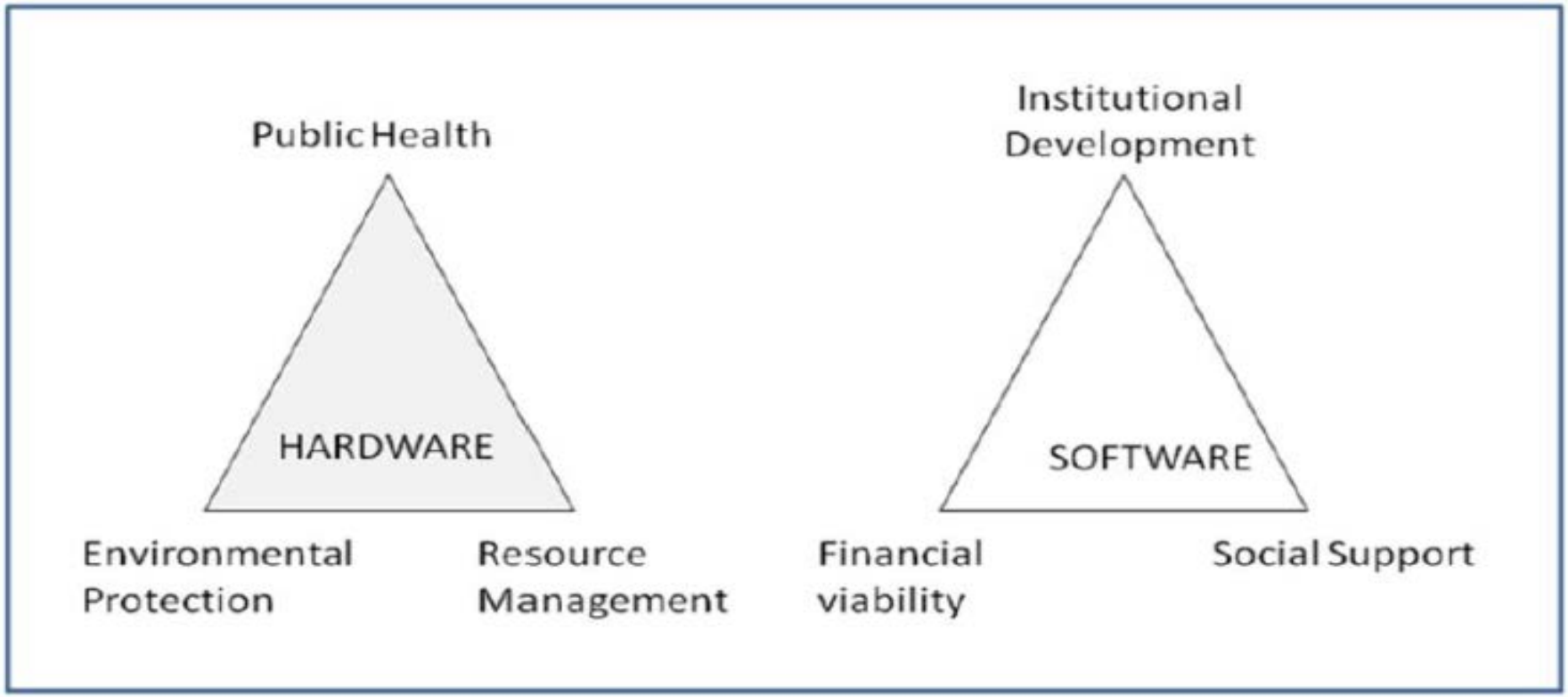
SPRAY DRYER (SCRUBBER)

A precise mixture of lime and water is sprayed into the combustion exhaust gases to remove acid gases, heavy metals, and trace organic emissions.

1 ton of municipal solid waste:
* produces 625 kilowatt-hours of electricity,
* is equivalent to 1.6 barrels (67 gallons of oil)

Wheelabrator Technologies I
A Waste Management Com

Hardware and Software

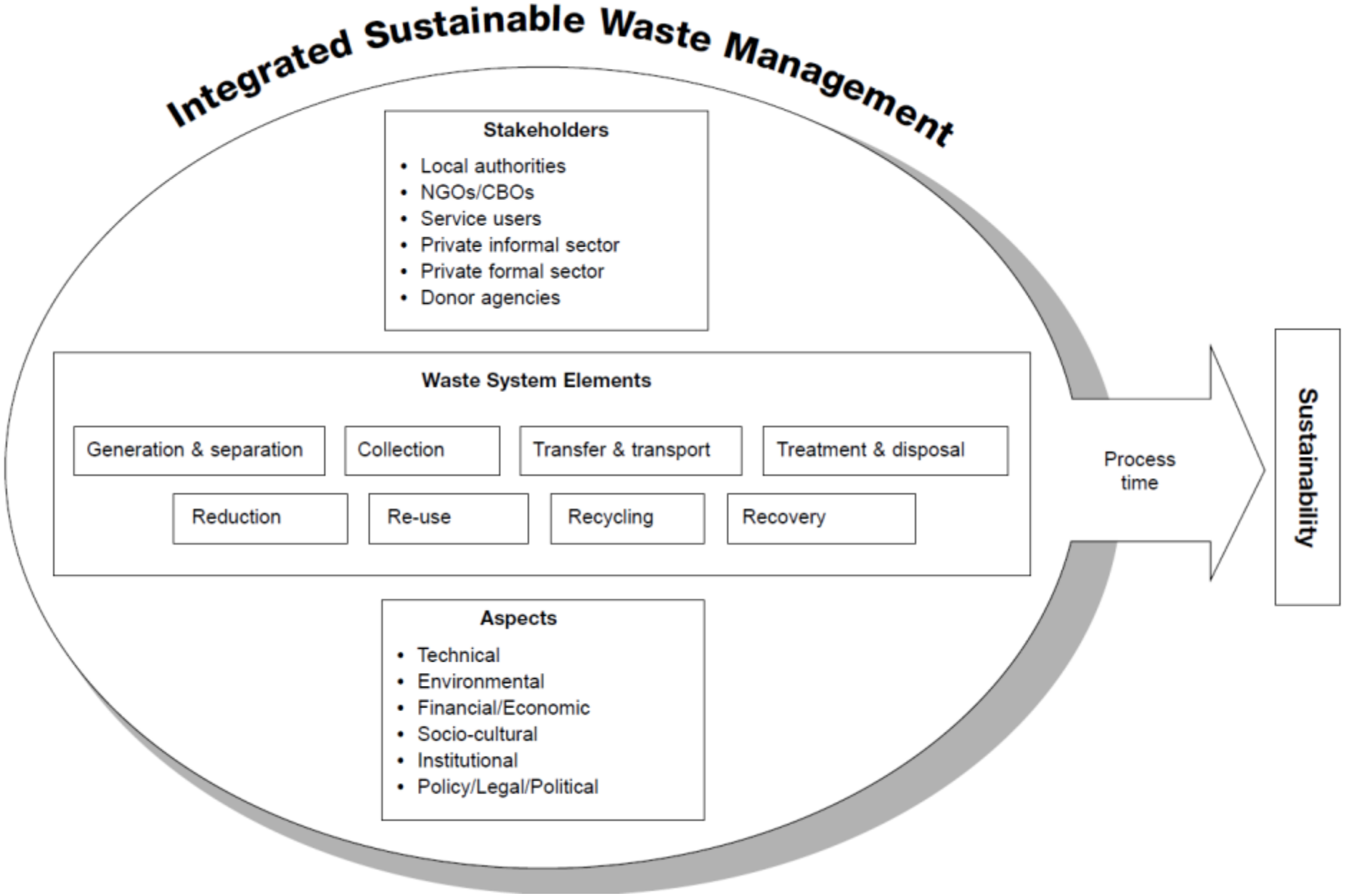


Hardware of ISWM

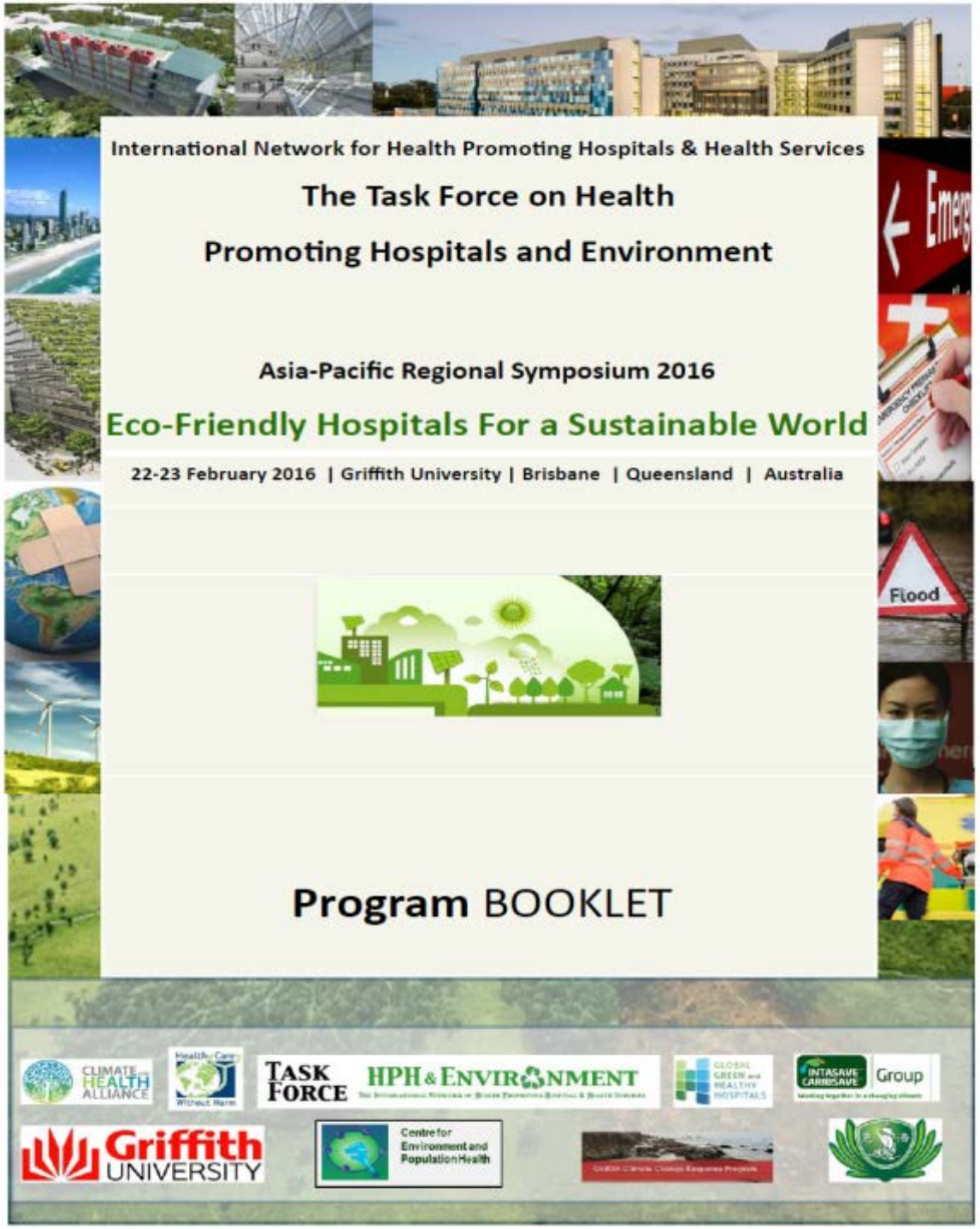
- Public Health (Collection)
- Environmental Protection (Waste Treatment and Disposal)
- Resource Management (Resource Recovery)

Software of ISWM

- Social Support (Participatory and Inclusive Planning)
- Financial Viability (Cost Recovery
- Institutional Development (Strong and Transparent)


Integrated Sustainable Waste Management
Stakeholders
Local authorities
NGOs/CBOs
Service users
Private informal sector
Private formal sector
Donor agencies
Waste System Elements
Generation & separation
Collection
Transfer & transport
Treatment & disposal
Reduction
Re-use
Recycling
Recovery
Aspects
Technical
Environmental
Financial/Economic
Socio-cultural
Institutional
Policy/Legal/Political
Process time
Sustainability

Thank You!



AN INTERNATIONAL KNOWLEDGE AND PRACTICE-SHARING REGIONAL SYMPOSIUM ON

"ECO-FRIENDLY HOSPITALS FOR A SUSTAINABLE WORLD"
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and co-hosted by Griffith University
Venue: Griffith University Nathan Campus, Building N18 (Central Theatre), Theatre II

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