Electronic Waste and the Socio Environmental Concern

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Points for discussion

1. What is electronic waste and WEEE ?
2. Why is it a problem?
3. What is UNIDO role?
4. What did we learn?
5. What do we recommend?
6. What further research may be conducted?

“E-waste and ("WEEE")

- Electronic waste, “E-waste"
- "Waste Electrical and Electronic Equipment" ("WEEE") is a waste consisting of any broken or unwanted electrical or electronic appliance.
- Many components of such equipment considered as toxic and not biodegradable

Waste Electrical and Electronic Equipment ("WEEE")

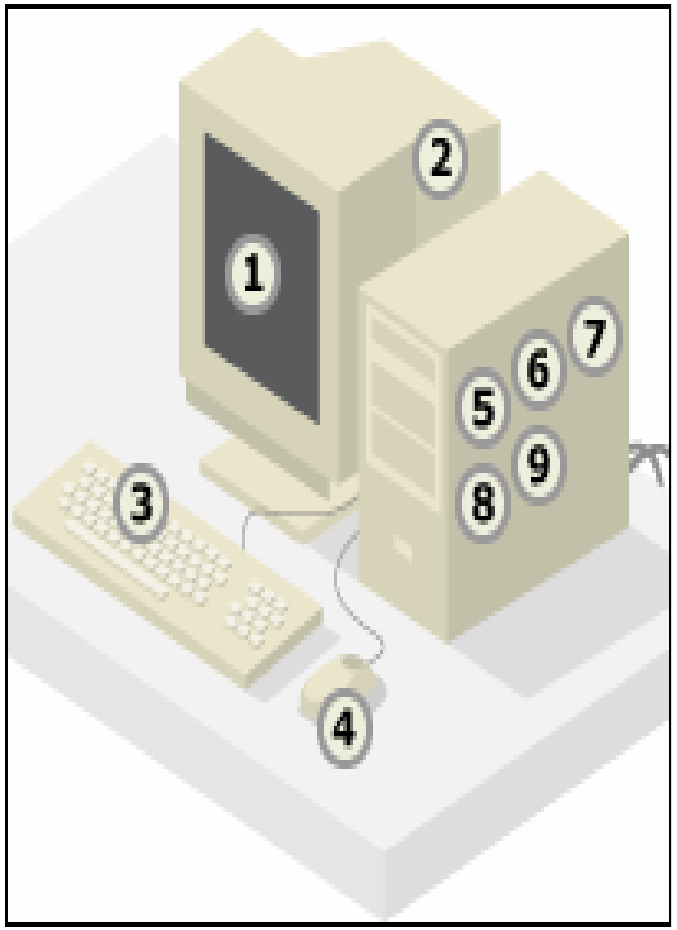
- Telecom Equipments
- Large Household Appliances\ Small Household Appliances Medical Devices
- Consumer & Lighting Equipments
- Electrical & Electronic Tools
- Toys, Leisure & Sports Equipment
- Monitoring & Control Instruments

IT

- Computers
- Monitors
- TV's, Radios, Videos ,Recorders
- Copiers
- Fax Machines
- Telephones, Wireless phones

Hazardous Waste in your Computer

1. **Lead** in cathode ray tube and solder
2. **Arsenic** in older cathode ray tubes
3. **Antimony trioxide** as flame retardant
4. **Poly-brominated flame retardants** in plastic casings, cables and circuit boards
5. **Selenium** in circuit boards as power supply rectifier
6. **Cadmium** in circuit boards and semiconductors
7. **Chromium** in steel as corrosion protection
8. **Cobalt** in steel for structure and mangetivity .
9. **Mercury** in switches and housing



E-Waste and Hazardous Materials

- Electronic products often contain hazardous and toxic materials that pose environmental risks if they are land filled or incinerated. (may include plastic, glass, steel, aluminum, copper, gold, silver, mercury and other metals. Pb ,Cd ,Ni , Cr , Mn and Zn,)
- Televisions, video and computer monitors use cathode ray tubes , which have significant amounts of lead.
- Printed circuit boards contain primarily plastic and copper, and most have small amounts of chromium, lead solder, nickel, zinc/ Flame Retardants .
- Also, capacitors in some types of older and larger equipment that is now entering the waste stream may contain polychlorinated biphenyls (PCBs)

Steps for Waste Management

1. Collection of WEEE
2. Safe Storage
3. Automated Separation
4. Material Recovery
5. Manual Dismantling & sorting
6. Disposal of Hazardous Material

- (The entire electronic recycling sector within Europe in 2008 is estimated to be eventually worth six billion euros (£4.1bn), so there is still a long way to go)

Actions to be considered

- Tests for REUSE in national Market ? Reuse is the environmentally best option and resource efficient consumption .
- Reuse provides opportunity, to who cannot afford or have no access to electronic equipment, at reduced or no cost.
- Takes useful COMPONENTS.
- Ferrous metals should be sold to metal dealers.
- Precious metals are recovered in professional way
- Rest goes to land filling / water filling- disturbs ecological equilibrium (These components if placed in a landfill ,the metal may leach out and pollute the ground water .)

What NEXT?

Managing E-waste and its recycling

- Equipment repaired and resale.
- De-manufacturing and disassembly.
- Recovery of valuable components.
- Hazardous and base metal recovery.
- Hazardous component management and environment friendly disposal.

- The Basel Convention on the Control of trans-boundary Movements of Hazardous Wastes and their Disposal was adopted in Basel, Switzerland in 1989. The Convention was initiated in response to numerous international scandals regarding hazardous waste The Convention entered into force in May 1992 .

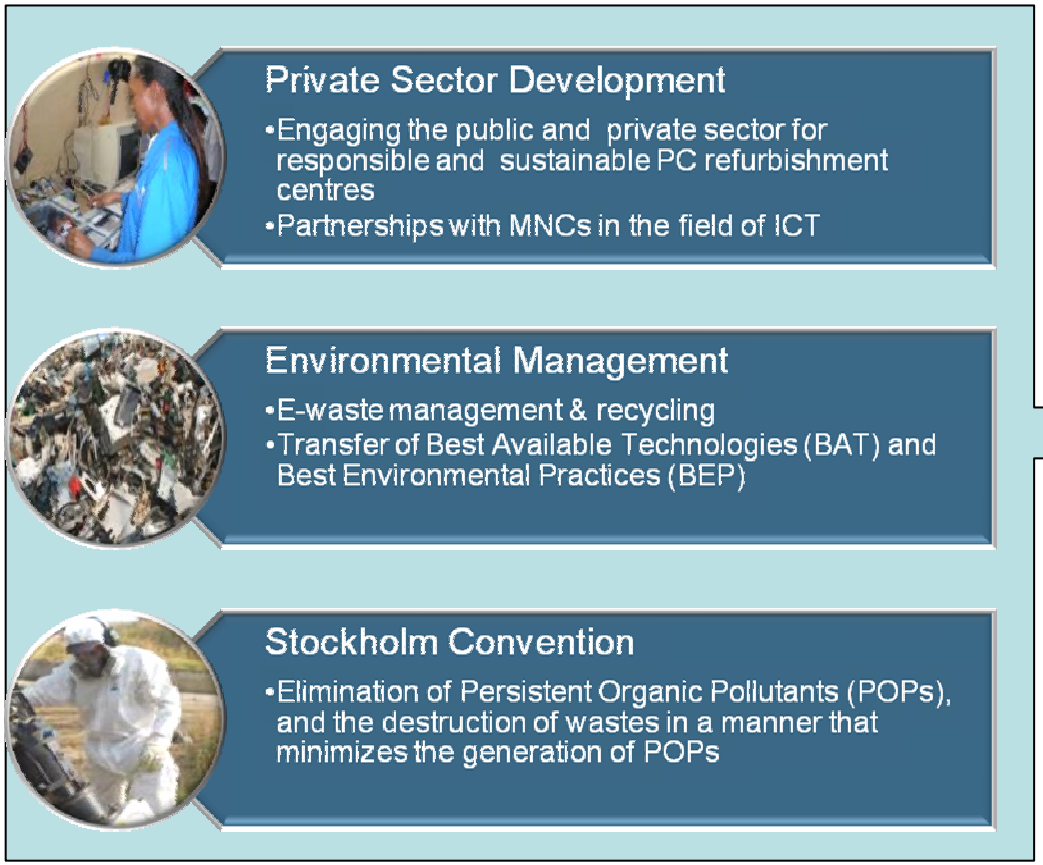
Suggested Solutions

- Well structured facilities/ Appropriate Infrastructure
- Modern material handling equipments.
- Fully equipped laboratory to facilitate R & D
- Facilities of extending latest knowledge to the qualified & experienced engineers.
- Barcode system for maintaining inventory movements.

Summary of Recommendations

- Development of an updated data base and information system
- Awareness program
- Development of the appropriate Policies reviewing the existing legal structure .
- Establishing centers for collection , temporary storage , dismantling and reuse
- Recycling activities need to be developed, with development of viable markets for recycling products

UNIDO approach in the area of E-waste



Joining complementary fields of expertise to offer an **integrated e-waste management package** of technical assistance

UNIDO activities in UCPC

- **Establishment of a refurbishment centre of excellence"**
- Related achievements ;In cooperation with Microsoft and the Makerere University, a "Report on the Market Survey for Refurbished Computers in Uganda" has been realized.
- a business plan has been developed for the establishment of a self-sustainable PC refurbishment centre of excellence. The business plan has been formulated with a view to prepare the ground for the formulation of a generic PC refurbishment centre business plan.
- Based on the above outputs, and in close cooperation with the Ministry of ICT, Microsoft and local private sector representatives a public-private partnership development process has been successfully initiated, which led to the establishment of a PC refurbishment centre of excellence, officially launched in June 2008.

Refurbished Computer Programme

Objectives:

- Affordable quality computer access for SMEs,
- Extend the life time of PCs
- Pilot & promote sustainable pro-poor business models

Approach:

- Local computer refurbishment centre of excellence
- Sustainable business model rather than donations
- Stringent quality criteria
- Environmentally sound disposal

Successful proof of concept:

- First PC refurbishment centre of excellence fully operational in Kampala, Uganda – launched in June 2008 and implemented in the framework of a PPP in cooperation with Microsoft
- First e-waste study ever formulated for Uganda

Morocco CPC

- Draft action plan with concerned partners and prepare a project proposal to be submitted to potential donors for funding
- Select a suitable Infra- structure for the WEEE as a permanent structure
- Insure technical expertise to this structure to implement the action plan (3 years)
- Implementation of E-waste treatment plants to operate within sustainable development frame.

Institutional linkages and partnerships in the area of e-waste

StEP
SOLVING THE E-WASTE PROBLEM

UNEP

UNESCO

THE GLOBAL COMPACT

Stockholm Convention on persistent organic pollutants (POPs)

Microsoft Unlimited Potential UP

EMPA

Thank you

please see attached annexes

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Environmental Threat from E-Waste

Element	Harmful Effects
Lead	•Extremely harmful to the human body; •Damages both the central and peripheral nervous systems; •Can cause seizures, retardation, high blood pressure, damage to the kidneys and liver; • Adversely affects child development
Beryllium	•Long term exposure can be carcinogenic, especially for the lungs. • Extreme exposure can lead to a potentially fatal condition known as Acute Beryllium Disease

ENVIRONMENTAL THREAT from E-Waste

Arsenic	•Arsenic is a notoriously potent poison; •Causes severe damage to the digestive tract
Mercury	•Attacks the central nervous and endocrine systems; •harmful to mouth, teeth and gums; •poses risk in the neurological development of unborn fetuses
Antimony	•Toxic to humans in ways similar to arsenic; fatal in large doses
Cadmium	•Potentially carcinogenic; Repeated exposure can damage the lungs, kidneys and liver

Refurbished Computer Programme (cont'd)

A replicable methodology for responsible local PC refurbishment: