



Overview Presentation : THE GLOBAL ISSUE OF E-WASTE

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Basel Convention Coordinating Centre for the African Region (BCCC-Africa) in Nigeria

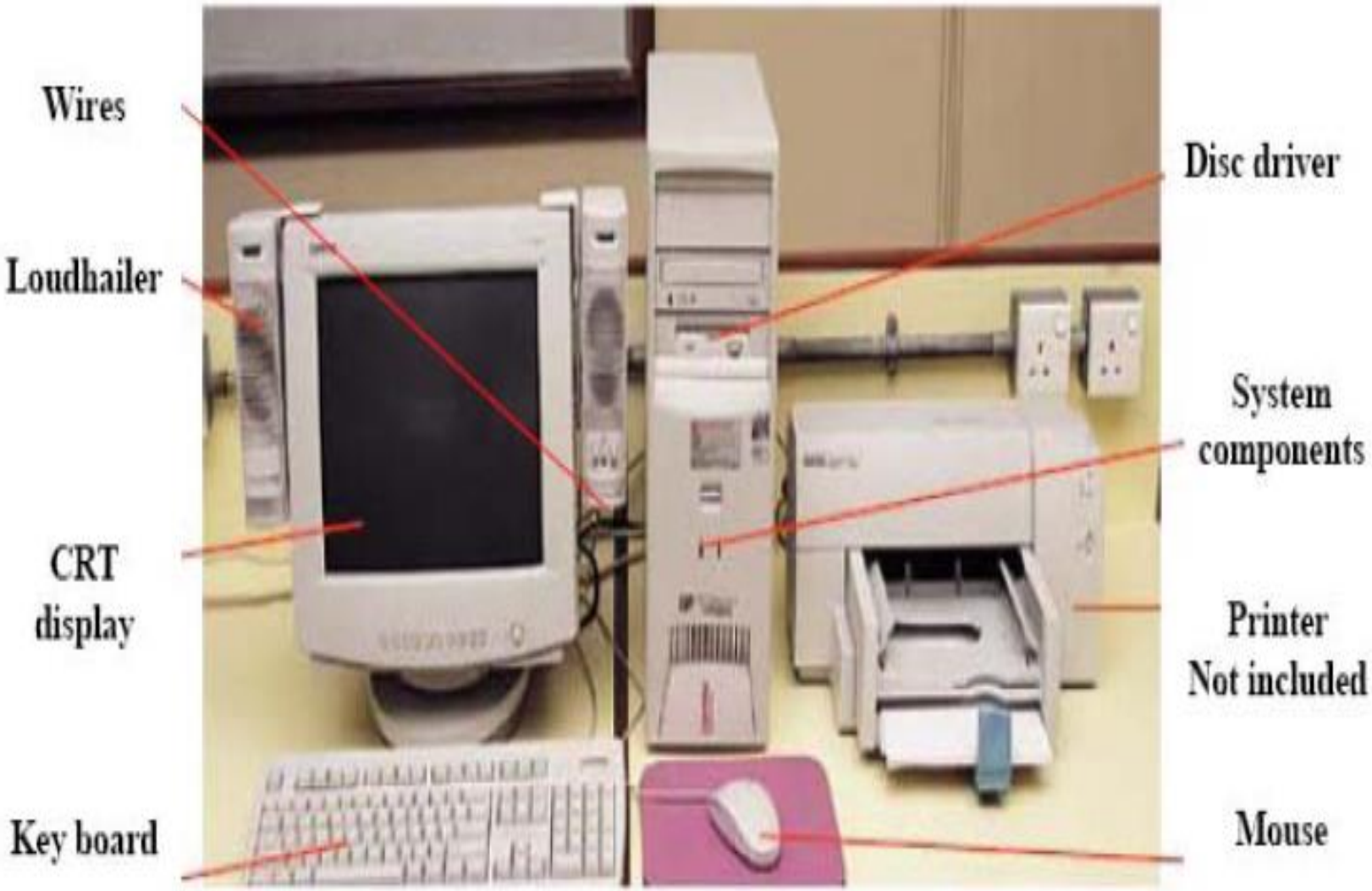
BRS/PACE/AUC Regional Workshop on E-waste , Golden Tulip Hotel, Lagos, Nigeria, 20-23 October 2015 .

Overview of Presentation

- Information Communication Technology(ICT) –Catalyst for Innovation, Sustainable Development and Socio-economic Transformation of Society
- Near Tsunami Generation of E-waste globally – Paradox of ICT Revolution & Innovation ;
- Near Tsunami Generation of E-waste globally – Tell Tale Sign of Unsustainable Production & Consumption
- Paradox of ICT Revolution & Innovation
- E-waste and constituents
- Used EEE and E-waste imports
- E-waste management and challenges globally and in Africa and Arab region
- Mapping of Global Actions /Initiatives on ESM of E-waste
- Activities/Actions undertaken to strengthen ESM of e-waste in Africa
- First Pan Africa Forum on E-waste in 2012
- Recommendations for ESM in Africa and Arab Region

Introduction

- **ICT has transformed the world into a global village : e-commerce, e-banking, e-voting, e-learning, teleconference etc.**
- **NEPAD has recognised information communication technology (ICT) as a critical factor in Africa's development.**
- **ICT helps to foster productivity and innovation as well as helping to achieve the Millennium Development Goals (MDGs).**
- **Africa has therefore been undergoing rapid advancement in ICT in recent years to bridge the digital divide**
- **ICT explosion is faciliated by the importation of secondhand or used computers and mobile phones from rich, developed countries especially Europe and North America as less than 20% of the African population can afford new EEE**
- **UEEE is valuable to socio-economic development of Africa as most ICT activities including cybercafés, educational institutions, banks and small businesses depend on imported secondhand computers and mobile phones.**

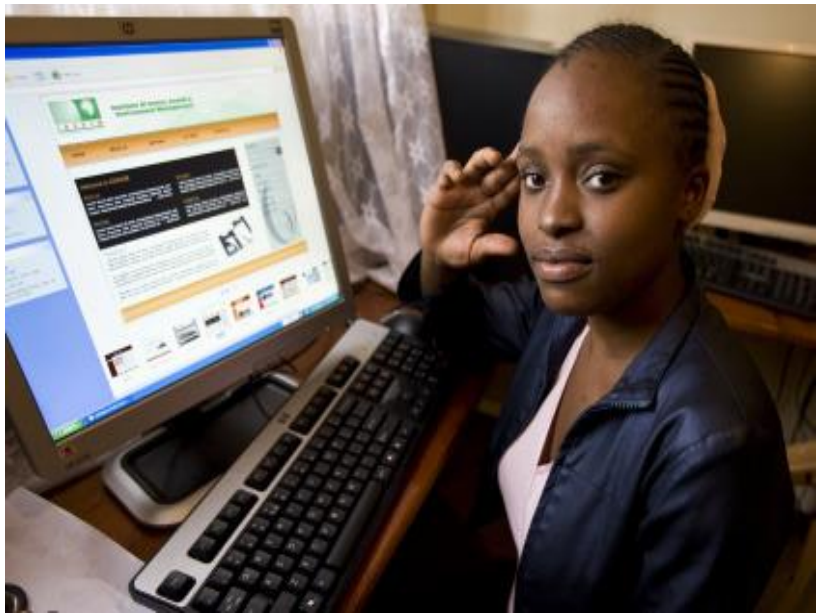


Typical computer set showing components and peripherals

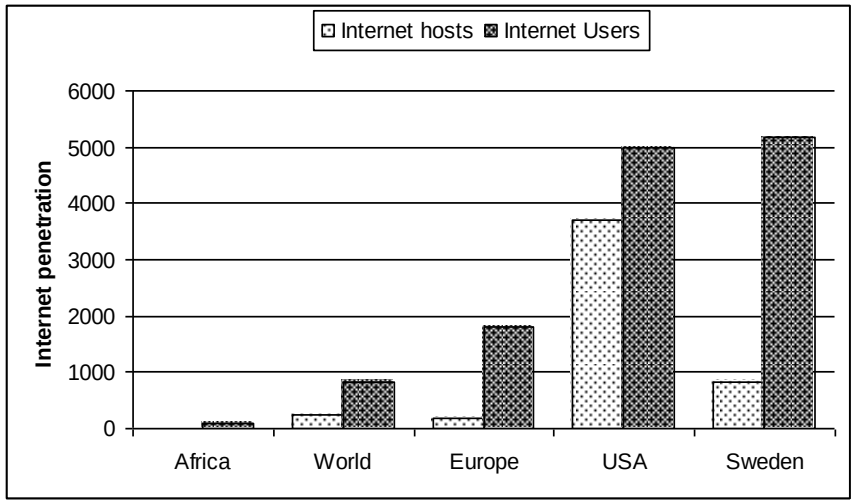
What is electronic waste?

Products of IT Age

Products of IT Age



Africa and ICT



Profile of Africa :

- According to ITU, about 2 billion people are on the internet, but too few in Africa.
- Internet penetration is low as 5.6% of the population (13% of global population) use the internet in Africa compared to the world average of 26.6 %
- However between 2000 and 2008, the number of users in Africa grew by a staggering 1,100 % compared to the rest of the world's 332.6 %.
- Thus Africa and Arab regions are estimated to have one of the fastest if not the fastest internet use growth rate

Globalization of E-waste –Dark Side of ICT Revolution

- **Early obsolescence of electronic products is causing production of uncontrollable large volumes of e-wastes, 40-50 million metric tonnes annually, fuelling near tsunami level export of e-waste from developed countries to developing countries thereby globalising the e-waste problem.**
- **The volume of obsolete PCs generated in developing regions is predicted to exceed that of developed regions by 2016-2018.**
- **Yet developing countries lack the regulatory infrastructure and resources for the environmentally sound management of e-waste, and employing crude treatment processes which pose high risk to environment and human health especially vulnerable groups (women and children).**

DEFINITIONS OF E-WASTE

1. **AN ELECTRICALLY POWERED APPLIANCE THAT NO LONGER SATISFIES THE CURRENT OWNER FOR ITS ORIGINAL PURPOSE.**
2. **ANYTHING WITH A PRINTED CIRCUIT BOARD AND ITS ASSOCIATED PERIPHERALS.**
3. **ANY APPLIANCE USING AN ELECTRICAL SUPPLY THAT HAS REACHED ITS END-OF-LIFE.**

e.g. -TVs, Monitors, Cell phones, Computers and Peripherals (printers, copiers, scanners, etc.), Stereos, Radios, VCR & DVD players, Smoke alarms, Medical equipment, White goods (refrigerators etc).

E-waste definition

EU WEEE RECAST, 2012

This defines Electrical and electronic equipment (EEE) as “any equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer, and measurement of such currents and fields and designed for use with a voltage rating not exceeding 1000 volts for alternating current and 1500 volts for direct current.” Consequently, ‘WEEE’ means EEE which is waste and all components, sub-assemblies and consumables which are part of the product at the time of discarding are included.

BASEL CONVENTION

Typology of E-waste by European Union

E-Waste Constituents

- Apart from Climate Change, e-waste is one of the major environmental challenges of the 21st century
  - E-waste has therefore become a global crisis , not only from the quantity, but also from various hazardous contents such as heavy metals and endocrine disrupting substances e.g. brominated flame retardants BFRs.
  - E-waste is also a paradox as it is both a problem and also an opportunity as it also contains valuable ferrous (e.g. iron), non-ferrous (e.g. copper), precious(e.g. gold and silver) and strategic metals (e.g. indium, gallium) that are scarce and may be lost if e-waste is improperly processed as in Africa and other developing regions of the world

E-waste types/components

Refrigerators/Air conditioners
- Polyurethane foam(only ref)
- Compressor
- (CFC gas in older models)
- Panels with Metals
- PWB (present in new models)

Cell phones
- Glass
- PWB
- Plastics
- Panels with Metals
- Lithium Battery

TVs & Computer monitors
- Glass
- PWB
- Panels with Metals
- Plastics
- Cu coil & other metals

Computer: Desk CPU, palmtop, laptop, etc
- Glass
- PWB
- Plastics
- Lithium Battery
- Panels with Metals

Others

Washing machines
- PWB (present new models)
- Plastics
- Panels with Metals

BCCC-Africa

BASEL CONVENTION

Basel Convention

BASEL CONVENTION

Adopted 1989

- Basel Convention is the only global convention on hazardous waste
- **E-waste in list A1180 Annex VIII of Basel Convention is hazardous waste**
- While E-waste in list B 1110, Annex IX is non- hazardous waste
- Technical Guidelines on TBM of E-waste and distinction between waste and non-waste approved temporarily at COP 12 and to be reviewed review in COP 13.

Basel Convention Provisions List A cont'd

✓**A1 – Metal and metal bearing wastes**

A1180 Waste electrical and electronic assemblies or scrap

E-waste containing components such as accumulators and other batteries included on list A, mercury-switches, glass from cathode-ray tubes and other activated glass and PCB capacitors, or contaminated with Annex I constituents (e.g., cadmium, mercury, lead, polychlorinated biphenyl) to an extent that they possess any of the characteristics contained in Annex III (note the related entry on list B B1110)

BAMAKO CONVENTION : E WASTE IS ALSO HAZARDOUS WASTE

BASEL CONVENTION

E-waste : Where did it all start and end up?

Known Sources

Known and Suspected Destinations

Sources: CBS News, Abiresearch, US-EPA, BAN, SVTC

… posing various challenges to Africa throughout the material life cycle of EEE

Photos by Empa


NIGERIAN PORTS AUTHORITY
PORT OF LAGOS APAPA QUAYS

E -waste –International Context

Problems

- **Electronic waste is the fastest growing waste stream in the world now estimated at 50 million tons per annum; and has become a growing portion of the municipal solid waste stream.**
- **Volume of obsolete PCs generated in developing regions will exceed that of developed regions by 2016 – 2018. - E –waste Tsunami problem ?!!!!**
- **Foresees that by 2030 developing countries will be discarding 400-700m obsolete PCs per year compared to 200-300m in developed countries.**
- **In 2007, 160 millions of PCs and 550 million mobile phones reached the end of their life**
- **Volume of African ICT equipment grows rapidly**
- **Developing countries will triple their e-waste by 2010**

Electronic products and Wastes in numbers

- **Equipment sold worldwide in 2011:**
  - **Computers: 353 million**
  - **TV sets: 248 million**
  - **Mobile phones: 1.59 Million**

- **41.5 million tons of e-waste was generated globally in 2011**

- **A more recent estimate of global e-waste generation has been put at about 41.8 million tons(Mt) (Balde et al. 2014).** Most of the e-waste generated in Asia was 16 Mt in 2014 or 3.7 kg per capita. The highest per capita e-waste quantity (15.6 kg/per capita) was generated in Europe. The whole region (including Russia) generated 11.6 Mt. The lowest quantity of e-waste was generated in Oceania, and was 0.6 Mt. but the per capita generation was nearly as high as Europe's (15.2 kg/ per capita). **The lowest amount of e-waste per capita was generated in Africa, where only 1.7 kg/capita was generated in 2014. The whole African continent generated 1.9 Mt of e-waste.**

The amount of e-waste generated is expected to grow to 49.8 Mt in 2018, with an annual growth rate of 4 to 5 per cent, making it the fastest growing waste stream in the world.

- **It is foreseen that in 2030 developing countries discarding 400 - 700 million obsolete PC/year compared to 200 million - 300 million in developed countries**

- **Experts estimate that recycling 1 million cell phones can recover about 24 kg (50 lb) of gold, 250 kg (550 lb) of silver, 9 kg (20 lb) of palladium, and more than 9,000 kg (20,000 lb) of copper**
- **Specific products of concern: CRTs, flat screen, batteries, CFCs/fridges**

Trends of EEE imports, use, and e-waste generation in West Africa

- Use of EEE in Africa is low but growing at a staggering pace
- West Africa serves as the major trading route of used EEE into Africa
- In 2009, up to 70% of all imports were used EEE: 30% of which was non-functional
- In 2010, between 50-85% of e-waste was domestically generated which needs to be managed

Quantitative data for EEE in Benin, Cote d'Ivoire, Ghana, Liberia and Nigeria related to imports, installed base and e-waste generated

Country	Imports of EEE		EEE in use		Waste Generated	
	tonnes/ year	there of used EEE	tonnes	Kg/inhabitant	Tones/year	
Benin	16,000	30%	55,000	6.32	9,700	
Cote d'Ivoire	25,000	48%	100,000	4.8	15,000	
Ghana	215,000	70%	984,000	41	179,000	
Liberia	3,500	10%	17,000	4.6	N/A	
Nigeria	1,200,000	35-70%	6,800,000	44	1,100,000	

Products consumed massively will create massive waste

WASTE COMPUTER COMPONENTS AND ACCESSORIES

WASTE CALCULATORS, TOYS, PHONES

Why so much global concern about e-waste ?

- ✓ Rising global quantities – fastest growing solid waste
- ✓ Presence of high levels of both precious e.g. gold, silver, copper, indium and palladium & toxic metals e.g. mercury, lead, cadmium; and endocrine disrupting brominated flame retardants e.g. PBDEs : precious metals economic opportunities _ Urban Mining !
- ✓ Poor designs - Difficulty in separation of components that are either mixed, bolted, screwed, snapped, glued or soldered together with toxic materials attached to non-toxic materials.
- ✓ Lack of regulations or where present weakly enforced
- ✓ Ethical issues : externalization of developed countries problems
- ✓ Thought to be one of the fastest emerging global challenges of our times after climate change.

Hazardous e-Waste Constituents

- ***Toxic Metals***

  Lead, Cadmium, Mercury, Beryllium, Selenium, Lithium, Antinomy, Arsenic

- ***Brominated Flame Retardants***

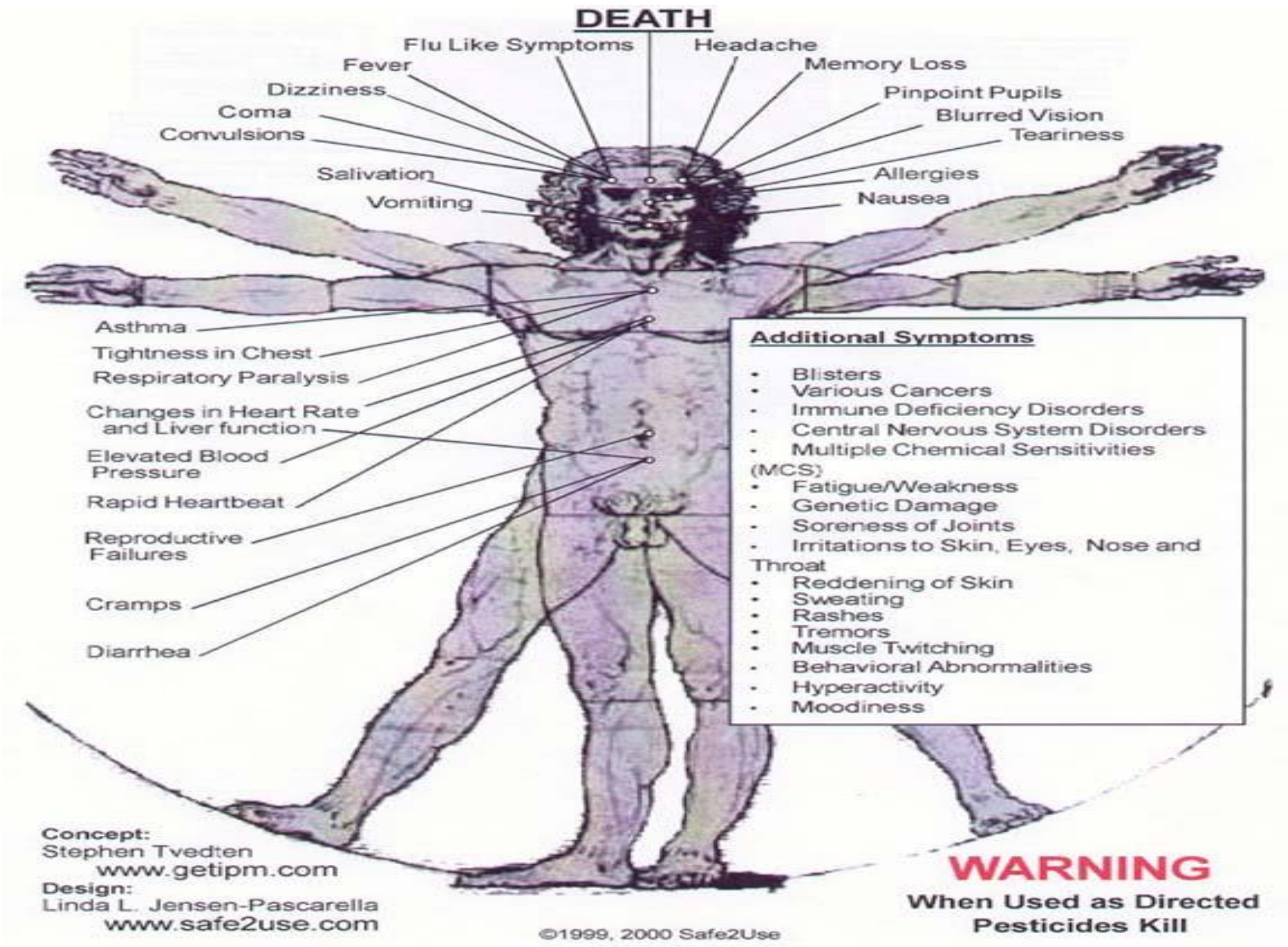
  TBBA (tetrabromo-bisphenol-A)
  PBDE (polybrominateddiphenyl) etc.

- ***Other Halogenated Hydrocarbons***

  PVC (polyvinyl chloride)
  CFCs (chloroflourocarbons)

- ***Rare Earth Elements***

  Yttrium, Europium, Americium


DEATH
Flu Like Symptoms
Headache
Fever
Memory Loss
Dizziness
Pinpoint Pupils
Coma
Blurred Vision
Convulsions
Teariness
Salivation
Allergies
Vomiting
Nausea
Asthma
Tightness in Chest
Respiratory Paralysis
Changes in Heart Rate and Liver function
Elevated Blood Pressure
Rapid Heartbeat
Reproductive Failures
Cramps
Diarrhea
Additional Symptoms
• Blisters
• Various Cancers
• Immune Deficiency Disorders
• Central Nervous System Disorders
• Multiple Chemical Sensitivities (MCS)
• Fatigue/Weakness
• Genetic Damage
• Soreness of Joints
• Irritations to Skin, Eyes, Nose and Throat
• Reddening of Skin
• Sweating
• Rashes
• Tremors
• Muscle Twitching
• Behavioral Abnormalities
• Hyperactivity
• Moodiness
Concept:
Stephen Tvedten
www.getipm.com
Design:
Linda L. Jensen-Pascarella
www.safe2use.com
©1999, 2000 Safe2Use
WARNING
When Used as Directed
Pesticides Kill

Some Major Human Health Diseases Caused By Brominated Flame Retardants (BFRs) in E-waste

endocrine disrupters

linked to thyroid and liver damage

cancer of the digestive and lymph system

neurotoxic effects

E –Waste International Context

- **Problems Continued**

- **Absence of infrastructure and facilities for ESM, hence use of crude management methods. – See slides that follow :**

- ***Environmentally Sound Management (ESM) is :***

"a scheme for ensuring that wastes and used and scrap materials are managed in a manner that will save natural resources, and protect human health and the environment against adverse effects that may result from such wastes and materials".

Crude Informal Recycling

- **Crude and Dangerous management practices include:**

❖ **Bashing open CRTs with hammers exposing the toxic phosphorous dust therein**

❖ **Open burning of circuit boards to melt the lead solder hence breathing toxic lead fumes**

❖ **Burning wires to melt the plastics to recover copper**

❖ **Open acid baths (nitric-acid) for separating metals**

❖ **Dumping pure acids and dissolved heavy metals into the soils, drains and rivers.**

HAZARDOUS PROCESSES IN INFORMAL E-WASTE RECYCLING

Process	Hazardous Emission
Copper extraction from PWBs, burning	Emission of brominated flame retardants, POPs, heavy metals, respirable suspended particulates (RSP)
Copper extraction from PWBs, without components, acid bath	Waste water contaminated with acid and heavy metals
Copper extraction from wires, burning	Burning of PVC releases POPs
CRT glass recycling	Heavy metal emission during smashing: lead, cadmium, etc
Capacitor burning	POPs emissions
Plastic recycling (plastic of casing is shredded and used in toys)	Waste water, emissions of dust containing plastic

- **Open Burning for disposal of used computers in open dumpsite in Lagos**

Young man repairing PWB of computer waste in Lagos

Cables collected for open burning and material recovery in Ghana

Open burning of cables for material recovery in Ghana

MANAGEMENT PRACTICES IN GHANA

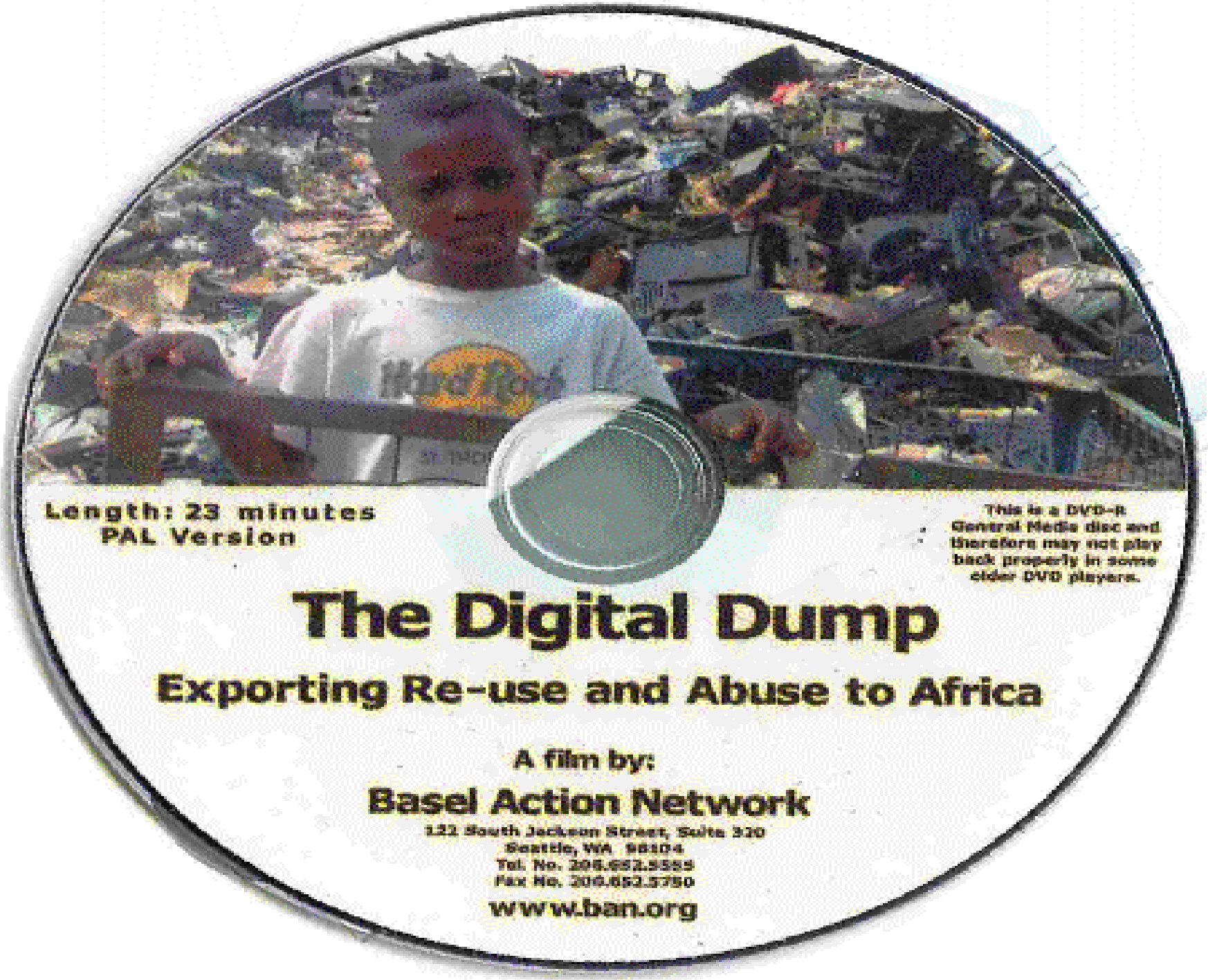
Fig. A

Fig. B

DISPOSAL AT OPEN DUMPS

E-WASTE MANAGEMENT IN NIGERIA: OPEN BURNING

Exposed: Scotland's toxic waste is poisoning Africa and Asia



Length: 23 minutes
PAL Version

This is a DVD-R General Media disc and therefore may not play back properly in some older DVD players.

The Digital Dump

Exporting Re-use and Abuse to Africa

A film by:

Basel Action Network
122 South Jackson Street, Suite 320
Seattle, WA 98104
Tel. No. 206.652.5585
Fax No. 206.652.5750
www.ban.org

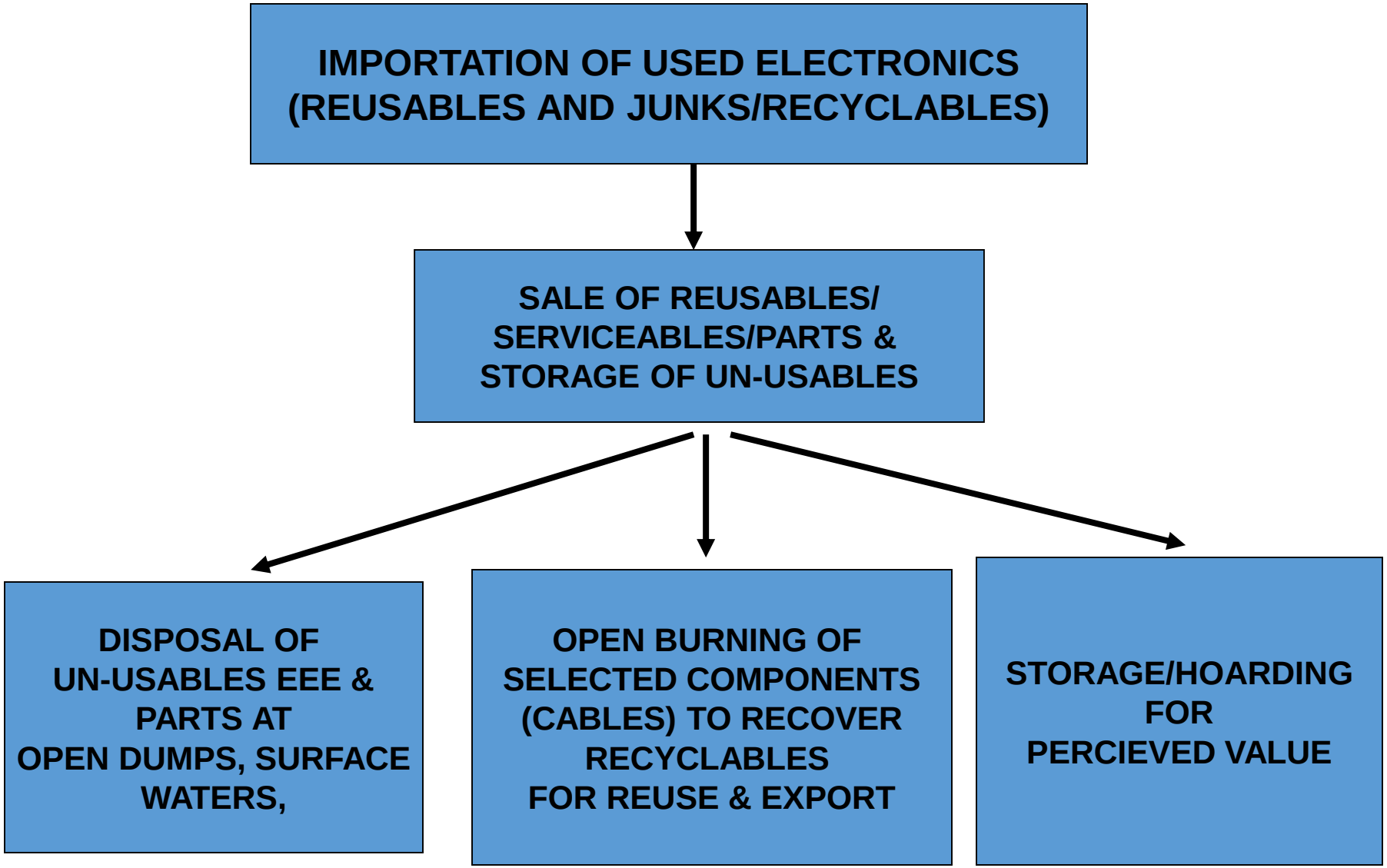
E-waste International Context

- **A Basel Action Network (BAN) coordinated study in Nigeria "Exporting Reuse and Abuse to Africa" (BAN 2005) revealed the level of transboundary movement of second hand and scrap electrical and electronic equipment into developing countries.**
- **An estimated 5 million personal computers, is imported annually into Nigeria through the major sea port of Lagos alone.**
- **About 25–75% of the imported second hand computer wares are unusable junk that are non-functional or unrepairable.**
- **Second hand computer wares are also imported through donations by charities to organizations and educational institutions (a minor source of import) which imports have also been found to contain 20-80% junk.**

E –waste Management Practices In Nigeria

- **Sale of reusable and serviceable parts**
- **Repair and refurbishment of used UEEE for reuse**
- **Disposal by dumping in non-engineered landfill, with subsequent open burning of irreparable e-waste components to reduce solid waste volume**
- **Materials recovery of recyclables such as copper, gold and silver from non-repairable e-waste by open burning of cables (for copper) and or boiling in acid (not common in Africa)**

MANAGEMENT PRACTICES IN NIGERIA



REASONS FOR PRESENT NATIONAL E-WASTE MANAGEMENT PRACTICES

- Large in-flow of secondhand EEE (majority are unusable)
- Ignorance of e-waste toxicity.
- Absence of infrastructure for formal recycling
- Absence of legislation dealing specifically with e-waste in most developing countries
- No effective take-back programs for end-of-life EEE(EPR)
- Source of livelihood to segments of the society through resource recovery, recycling and export of certain components such as printed circuit boards.
- Limited awareness of entrepreneurial opportunities

ENVIRONMENTAL IMPLICATIONS OF THE PRESENT E-WASTE MANAGEMENT PRACTICES

- **Loss of resources that could be recovered through recycling**
- **Energy wastage in producing new components and products**
- **Environmental pollution - hazards to plants & animals**
- **Health implications - human exposure to toxins**

Challenges in E-waste management in Africa: Environmental Aspects

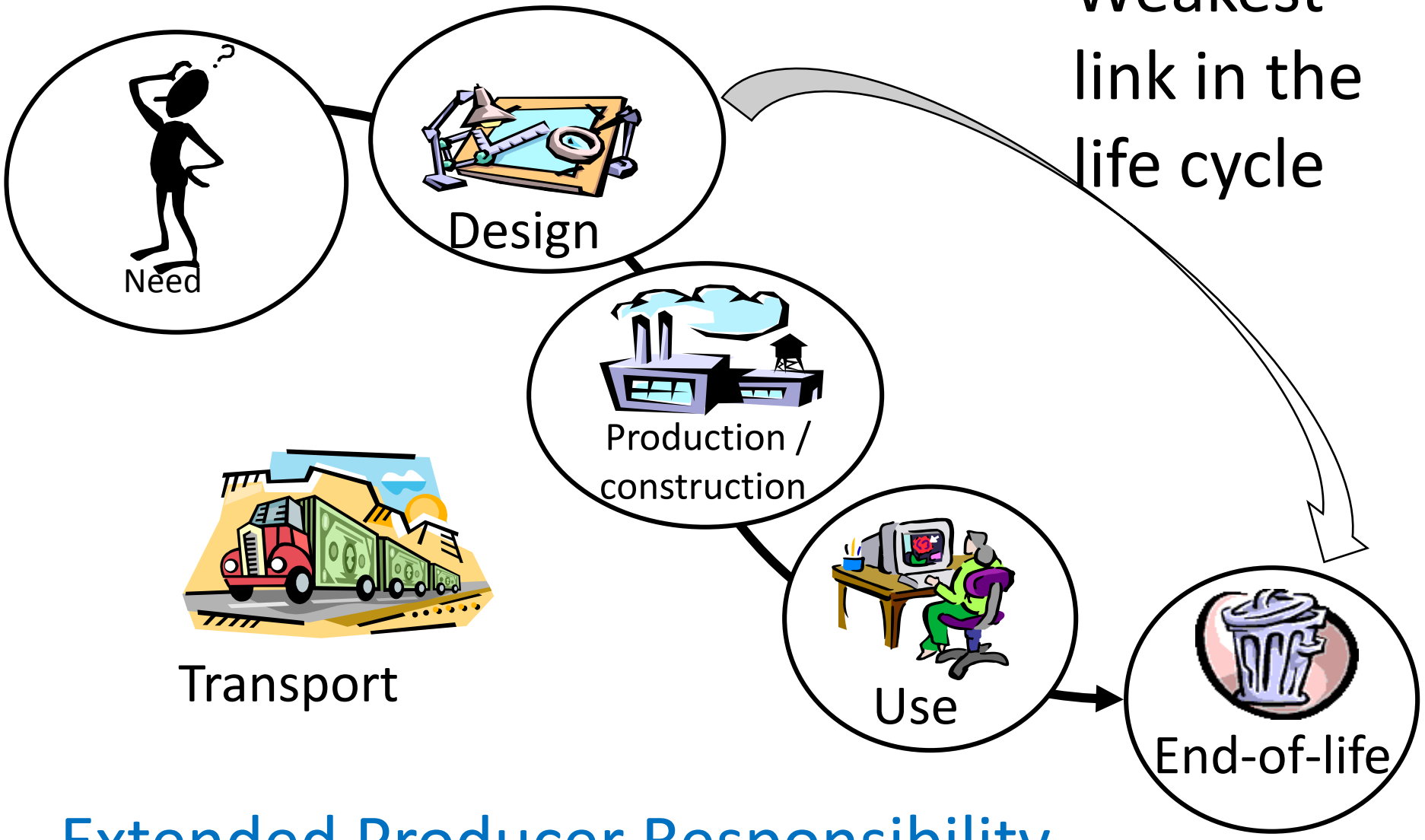
GeSI & StEP E-waste Academy

- **Major environmental and human health impacts result from crude dismantling, material recovery and final disposal through release of hazardous substances into soil, water and air**
- **Impacts during collection, refurbishment and repair of EEE could be less significant with appropriate safety measures adopted.**
- **Cable burning is a major source of POPs dioxin emissions**
- **Environmental monitoring in Ghana and Nigeria have provided scientific evidence of gross contamination of soil, plants, ground water, surface water and sediments with heavy metals such as lead, nickel, mercury and BFRs such as PBDEs at levels several folds higher than EU threshold limit of 1000mg/kg (RoHS) – Read posters on the wall describing the scientific findings and references where published in international journals. .**
- **Portend risk factors to attainment of sustainable**

E-waste International Context

- **Problems**
- **No effective take back schemes for end of life EEE.**
- **Uncontrolled dumping of obsolete e-products and material recovery processes without protective measures in the informal sector has caused:**
  - ✓ **environmental pollution**
  - ✓ **millions of people exposed to toxins, such as dioxins and brominated flame retardants in plastics.**

Life Cycle Thinking



Extended Producer Responsibility

Main Objectives

Distribution & Consumption → **Collection** → **Pre-Processing** → **End-Processing** → **Disposal**

Access	100%	recovery of resources/ segregation of hazardous waste	Safe

E-Waste International Context

Solutions

- **The technology for environmentally sound dismantling and disposal of e-waste exists, but:**
  - **it needs to be transferred to developing countries.**
  - **it has to be linked to the product life-cycle to become economically viable.**
- **Efforts to bridge the digital divide need to follow the life-cycle approach to avoid problems for the health of workers and the general public, as well to the environment.**

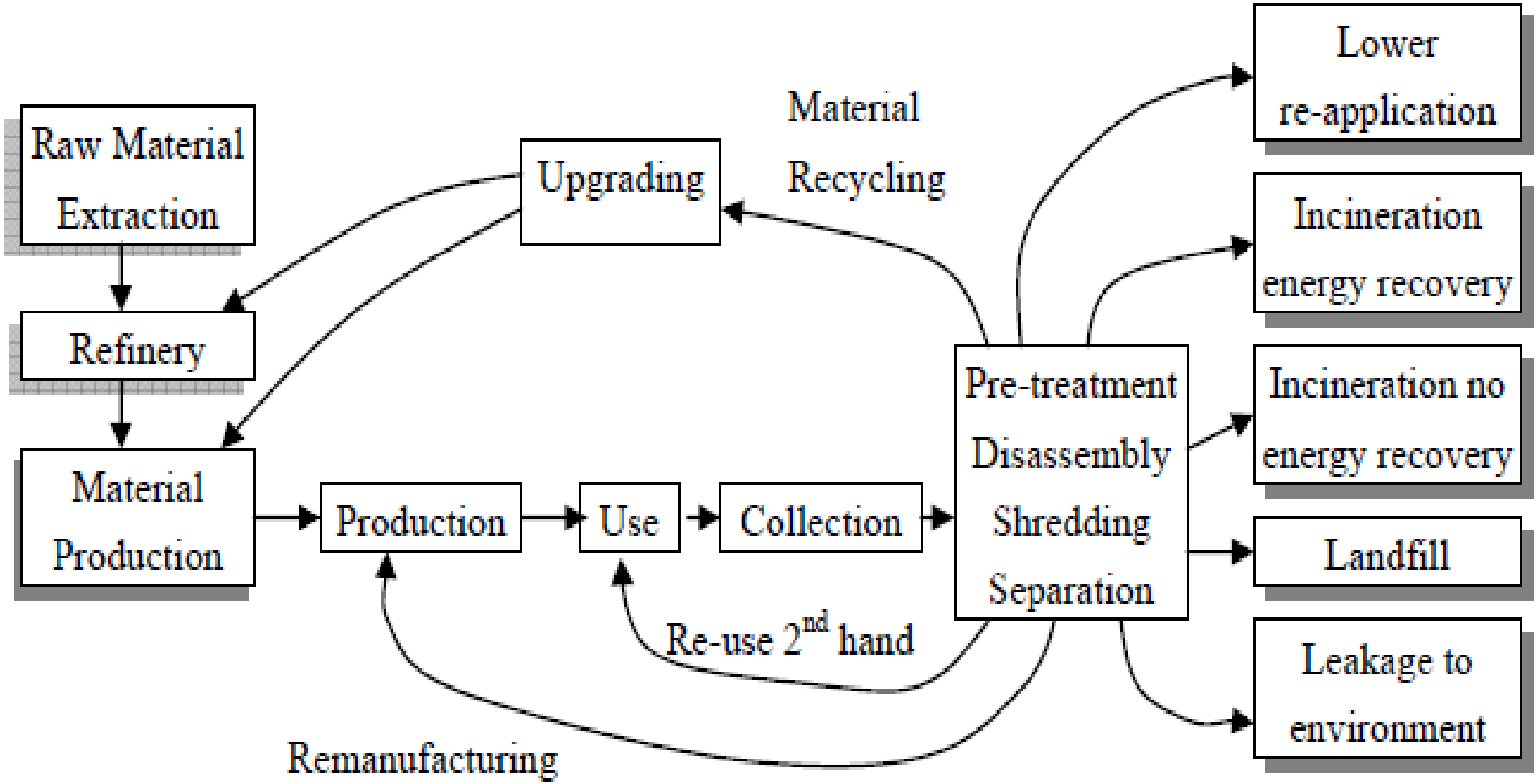


Fig.1.1 Life cycle of electrical and electronic equipment [Huisman, 2003]

The recycling chain for e-waste is in three main steps:

(i) collection,

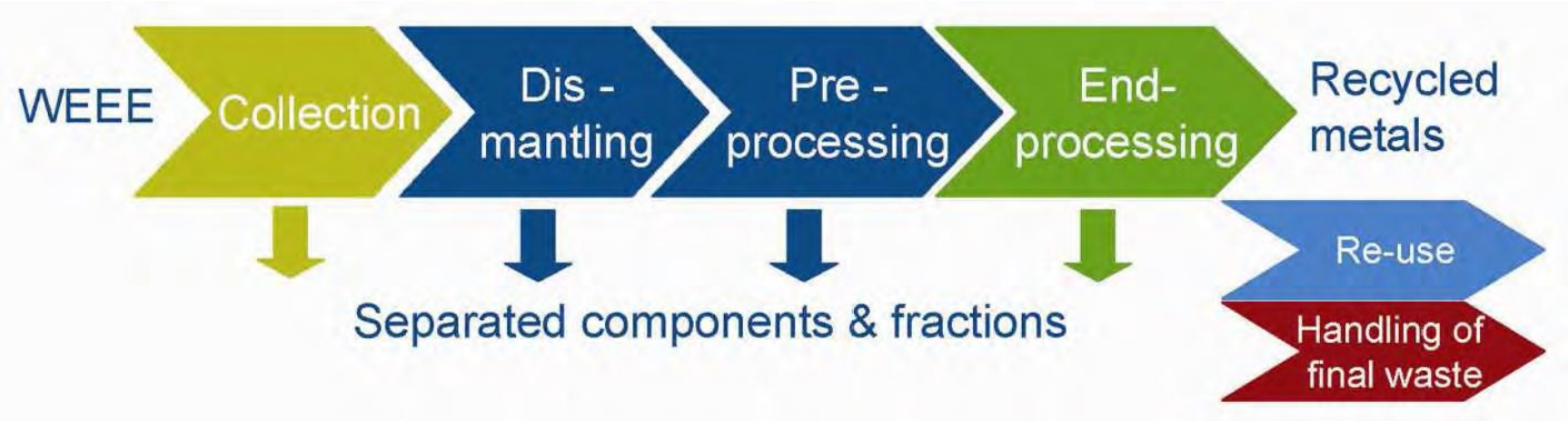
(ii) sorting/dismantling and pre processing (including sorting, dismantling and mechanical treatment)

(iii) End processing.

The main objectives of e-waste management are:

- **Treat the hazardous fractions in an environmentally sound manner,**
- **Recover maximum valuable material**
- **Create eco-efficient and sustainable business,**
- **Consider social impact and local context.**

Collection is important



Efficient Collection and Treatment

- **More collection of electrical and electronic appliances allows for more efficient recycling,**
- **It keeps valuable e-waste components (e.g. metals) in the economy and**
- **Enables safe disposal of harmful components in order to prevent risks to human health and the environment.**
- **China has shown how state-of-the-art e-waste recycling plants fail when not supported by a proper collection network**

Structure of E-waste management in Africa : Social Factors

1. Repair & refurbish

2. Collect

3. Dismantling / pre-processing

Refurbishers

Scrap metal workers (sometimes “scavengers”)

Major Challenges to Solving E-Waste Problems In Africa/Arab Countries

- Absence of infrastructure for environmentally sound management of e-waste ,
- Absence of legislation dealing specifically with e-waste including control of transboundary movement,
- Non-domestication of Basel, Basel Ban Amendment; Bamako and Stockholm Conventions and problem of near end of life EEE
- Absence of any framework for end-of-life (EoL) product take-back or implementation of extended producer responsibility (EPR).
- Lack of a regional approach since countries have different approaches to the e-waste issue
- Inadequate public education and awareness on the problems associated with the uncontrolled importation of near-end-of-life and end-of-life EEE

Major Challenges to Solving E-Waste Problems In Developing Countries

- **A considerable part of the e-waste exported from developed countries is exported illegally in contradiction to international (Basel Convention) or regional (EU waste shipment regulation; African Bamako Convention) legislation from either of the following perspectives:**

  (a) completely illegal shipment, where the rules applicable are not respected; or

  (b) e-waste that is shipped under a false pretence, e.g., e-waste reported to be post-consumer products for re-use, while they are clearly are no longer fit for re-use.

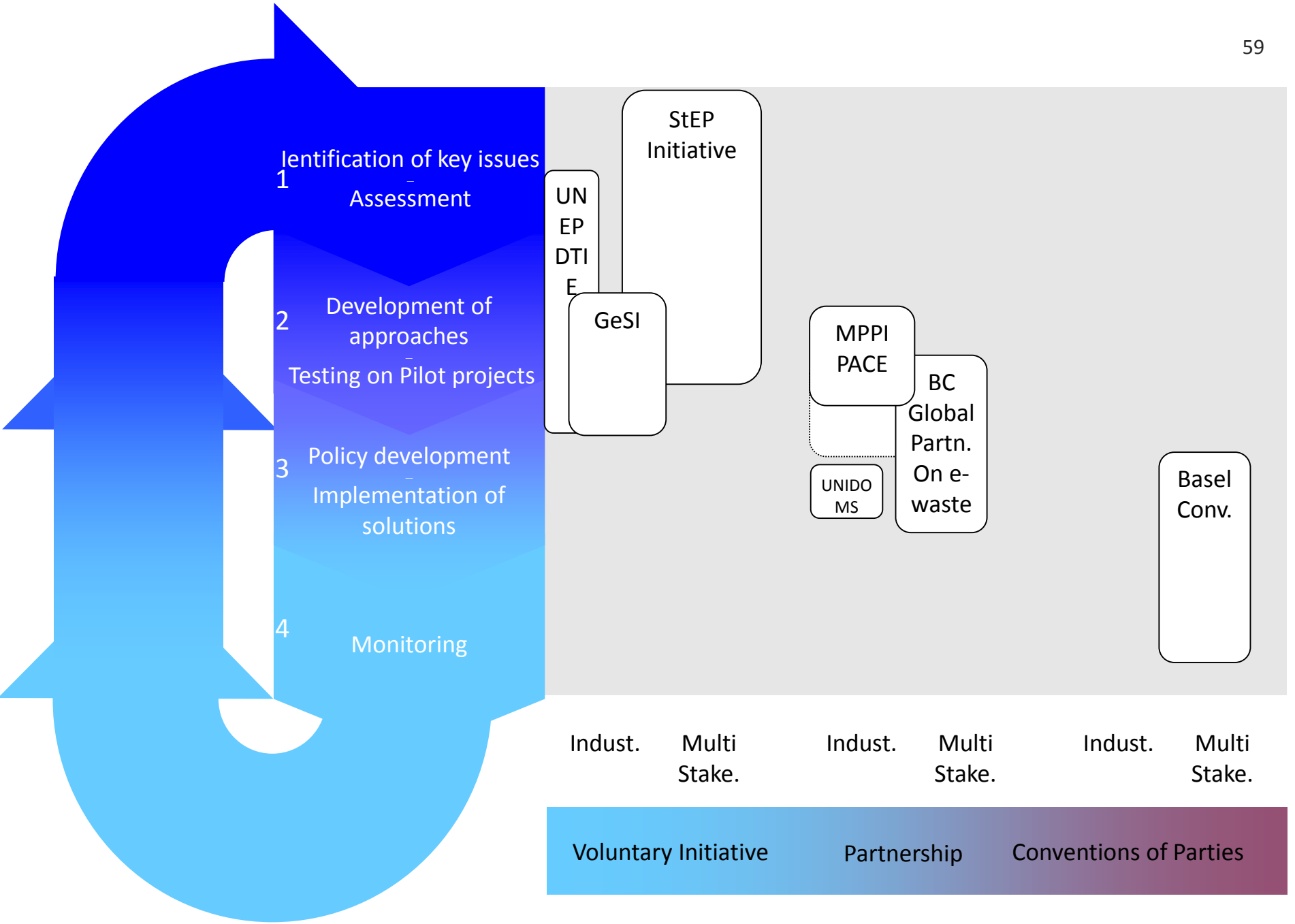
  (c) Lack of international consensus on the distinction between ‘’Waste ‘’ and ‘’ Non-waste ‘’

E-waste is hazardous waste under Basel and Bamako Conventions

Major Challenges to Solving E-Waste Problems In Developing Countries

- The crude recycling operations in Africa can seriously jeopardize the health of workers and severely pollute the environment.
- Waste management occurs in the informal sector of the economy involving thousands of poor people ignorant of the hazard of exposure to toxins in e-waste.
- The most vulnerable groups especially children and women with gender perspective are actively involved in e-waste scavenging and crude recycling activities.
- Although crude recycling provides employment for youths, hazardous substances in e-wastes may actually cause serious health risks and worsen their poverty.
- Yet many of these end of life electronic products come primarily from developed countries which prohibit export of e-waste to developing countries.

ARTWORK WARNING OF POSSIBLE E-WASTE TAKE OVER OF AFRICAN CONTINENT DUE TO INACTION



MAPPING OF GLOBAL EFFORTS AT SOLVING E-WASTE PROBLEM

MAPPING OF GLOBAL ACTIONS /INITIATIVES TO ADDRESS ESM OF E-WASTE

The e-waste issue is a global problem arising from globalisation with transboundary movement among all countries and all regions and therefore requires global solutions.

- **Global initiatives** by various stakeholders towards achieving ESM of e-waste include the following:

- **Multistakeholder partnerships** under the Basel Convention exemplified by **Mobile Phone Partnership Initiative (MPPI)** in 2002; and **Partnership for Action on Computing Equipment (PACE) in 2008.**

- **Solving the E-waste Problem (StEP) of the United Nations University (UNU) and UNESCO**

- **Global e-Sustainability Initiative (GeSI) in 2001– E-waste Working Group established by UNEP DTIE**

-- **Secretariat of Basel Convention (SBC) E-waste Africa Project (2009-2012) involved 7 African countries.**

- **Hazardous substances within the lifecycle of electrical and electronic equipment (HSLEEP) was** adopted as an emerging policy issue at ICCM2 in Geneva in 2009; further considered at OEWG1 in 2011 and added to Global Plan of Action (GPA) at ICCM3 in 2012**; road map of activities to be implemented till 2019 approved at ICCM4 in September 2015. Little extant activities on upstream issues including green design and design for environment (dfE) .**

- National Environmental Standards and Regulations Enforcement Agency (NESREA) organised an international conference on e-waste in September 2009 and issued the "Abuja Platform" indicating elements of actions necessary to achieve ESM of e-waste at regional and national levels

MAPPING OF GLOBAL ACTIONS /INITIATIVES TO ADDRESS ESM OF E-WASTE – SAICM ICCM4

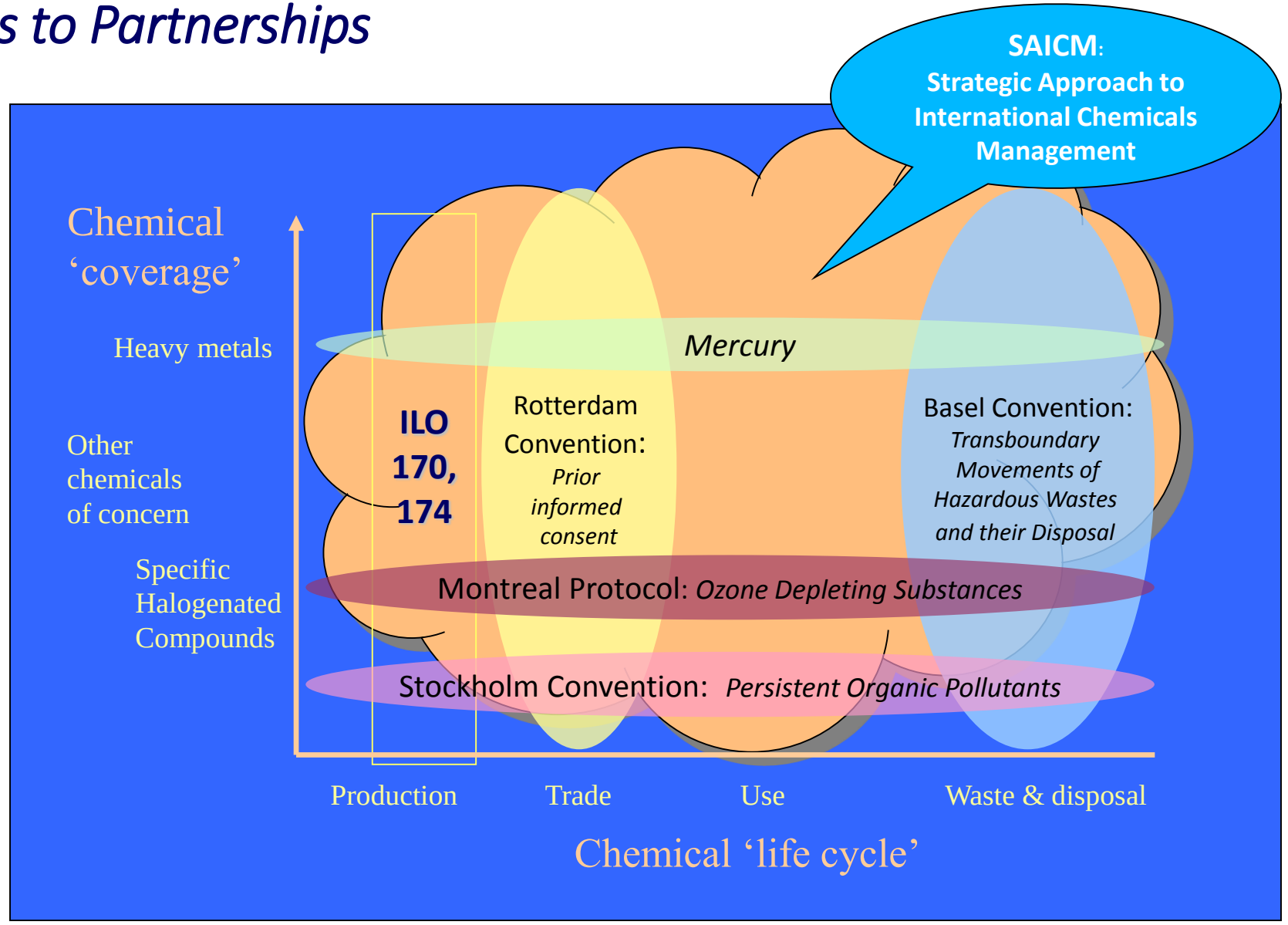
- **Hazardous substances within the lifecycle of electrical and electronic equipment (HSLEEP)** adopted as an emerging policy issue at ICCM2 in Geneva in 2009;

- Organisation of International workshop on hazardous substances within the life-cycle of electrical and electronic products(HSLEEP), held in Vienna, from 29 to 31 March 2011 (SAICM/ICCM.3/INF/24).

- Further considered and endorsed at OEWG1 in 2011
- Issue added to Global Plan of Action (GPA) at ICCM3 in 2012;
- **Road map of activities to be implemented till 2019 approved at ICCM4 in September 2015.**
- **Little extant activities on upstream issues including green design and design for environment (dfE) recognised**

Words to Actions:

Treaties to Partnerships



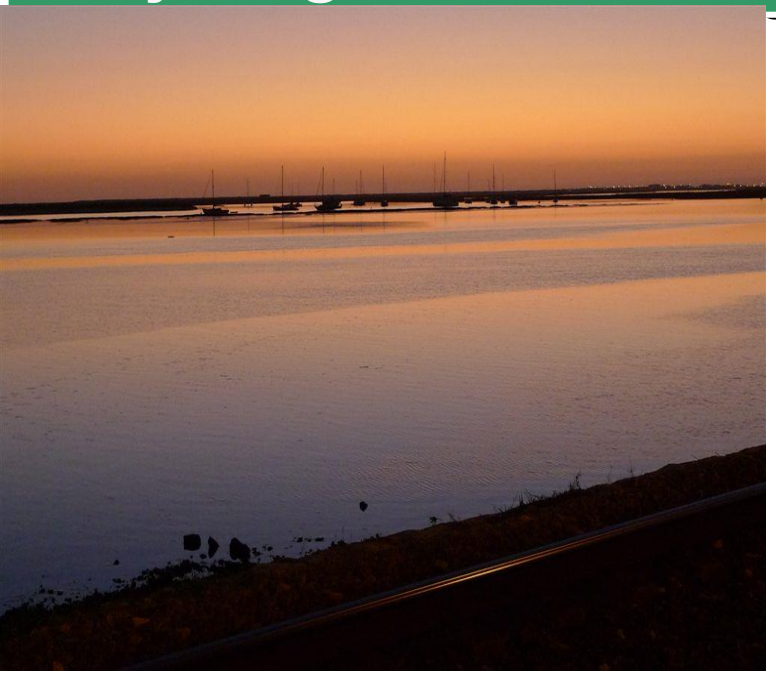
Waste & Chemicals MEAs : Current Status in Africa

- **Three Conventions which implementation and enforcement are critically important for the control of E-waste in Africa are :**
- **- Basel Convention : 44/55 or 89%**
  - Bamako Convention : 24/55 or 44%
  - Basel Ban Amendment : 13/55 or 24 %
- **The number of countries that have ratified these conventions out of 55 African countries and the % ratifications are indicated in parenthesis above.**
- **Only 6 countries (6/55) or approx 11 % ; comprising : Egypt, Ethiopia, Gambia, Mauritius , Tanzania and Tunisia have ratified all the 3 conventions**
- **None or all of the 3 Conventions have been domesticated into national laws in the region including Basel Convention which about 90% of the countries have ratified.**
- **Low general public awareness and lack of political will are responsible for the weak regulatory infrastructure and enforcement of extant inadequate laws, hence the vulnerability of African countries as dumping ground for E-waste**

Activities/Actions undertaken to Strengthen ESM of E-waste in Africa Region

Secretariat of Basel Convention (SBC) E-waste Africa Project 2009 -2012

Project goal and components



Goal:

Enhance environmental governance for e-waste in selected African countries

I. A study on **flows of used EEE and e-waste** imported into Benin, Côte d'Ivoire, Ghana, Liberia and Nigeria, from European countries

II. National **assessments** and national environmentally sound management **plans**

III. A **socio-economic study** on the e-waste sector in Nigeria and a feasibility study of **international cooperation** between African SMEs and European recycling companies

IV. Enforcement programme in Benin, Egypt, Ghana, Nigeria and Tunisia to **prevent illegal transboundary movements** of e-waste

Flows of EEE and e-waste between Europe and West Africa and enforcement of Basel provisions

- **Pathways** of used EEE from the formal to the informal sector
- **Brokers and traders** are key players
- Ports of Amsterdam and Antwerp were used as examples of **gateways** for used EEE.

- Several challenges related to the **enforcement** of Basel provisions (e.g. clear distinction between used EEE and e-waste)
- **Coordination** at the national level
- International **cooperation** between regulatory and enforcement authorities

Conclusions and recommendations pertaining to issues listed below

- **Imports**
- **Collection and recycling**
- **Policy and legislation**
- **Enforcement**

UNEP

BASEL CONVENTION

Where are WEee in Africa?

FINDINGS FROM THE BASEL CONVENTION E-WASTE AFRICA PROGRAMME

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

BASEL CONVENTION

EMPA
Materials Science & Technology

Decision COP 1 -Bamako Convention on E-Waste

- **COP 1 of 1998 Bamako Convention held in Bamako , Mali in 2013 adopted for inclusion in the convention e-waste as hazardous waste**

- **COP1 took a decision *Calling upon,* Parties and other African states to consider all non-functional or untested used electronic equipment as hazardous waste and prevent their importation into the African Continent.**
- **However Bamako convention banning import and export of e-waste within the African region is a hindrance to free trade in e-waste and sustainability of regional recycling facilities**

Other E-waste Activities In Africa

- UNEP organized a side event with OEMs Alliance in Africa at African Ministerial Conference on Environment (AMCEN) – 14 at Arusha International Conference Centre, Tanzania on Tuesday 11th September, 2012 on the theme **"WHERE DOES AFRICA STAND ON THE E-WASTE ISSUE? ".**
- Objective of AMCEN side event :To focus the attention of African ministers of environment and senior officials on e-waste so that appropriate policy interventions and practical measures can be implemented in the long-term using evidence-based decision-making.
- Pilot projects on-going on e-waste collection in **Burkina Faso; and collection and dismantling in Egypt, Kenya and Uganda**.

PACE ACHIEVEMENTS IN E-WASTE GLOBALLY

PACE products that have been finalized and adopted:

- Guidance Document on the Environmentally Sound Management (ESM) of Used and End-of-Life Computing Equipment (except section 3 on TBM)
- Report on ESM criteria recommendation
- Two Guidelines on: - Repair and refurbishment; and - Material recovery and recycling
- Glossary of Terms for PACE

PACE ACHIEVEMENTS IN E-WASTE GLOBALLY -CONTD

- E-waste surveys in Burkina Faso, El Salvador, Jordan and Serbia completed.
- Pilot project in Jordan, Serbia and Burkina Faso, Swaziland and Botswana on collection and management of used and end-of-life computing equipment from informal sectors on-going.
- Training workshops on PACE guidelines were held in BCRC-China, BCRC- Slovakia, BCRC- El Salvador, BCRC- Trinidad and Tobago, and now Nigeria.
- At least ten webinars in English, Spanish and French language were organized on extended producer responsibility and on material recovery.

FIRST PAN AFRICA E-WASTE FORUM MARCH 2012, NAIROBI- POST SBC E-WASTE AFRICA PROJECT

BASEL CONVENTION

UNEP

Pan-African Forum on E-waste

United Nations Office at Nairobi, Kenya
14 - 16 March 2012

Challenges and Opportunities for a Sustainable Solution

Join us in Nairobi and be part of a new initiative
to address the e-waste problem facing Africa

170 delegates

18 African countries
EAC
ECOWAS
IMPEL

UNEP
UNIDO
SBC (Basel)
BCRCs/BCCC

US EPA
BAN

OEMs : HP, DELL, NOKIA
SIMS
DATEC
EACR
WEEE center /CFSK

Prof Osibanjo - Chair

including those that take place outside of the continent, in cooperation with African States, States outside the region, regional organizations, intergovernmental organizations, academia, the private s

Outcome of -1st Pan Africa E-waste Forum : Call for Action on E-waste In Africa

- ***The Pan-African Forum on E-waste calls for action/presents its vision*** to **develop a framework for an environmentally sound management of e-waste for the African continent** respectful of the human health and the environment and promoting opportunities for social and economic development.
-

- **Participants (Vision)** see the future for Africa free of e-waste achieved through the proper management of all aspects of the life cycle of electrical electronic equipment including those that take place outside of the continent, in cooperation with African States, States outside the region, regional organizations, intergovernmental organizations, academia, the private sector and civil society groups.

Outcome of -1st Pan Africa E-waste Forum : Call for Action on E-waste In Africa : *Set of priority actions for Achieving ESM of E-waste*

The following eight (8) priority actions for implementation were identified :

- ***Baseline e-waste assessment***
- ***Legal, policy and regulatory frameworks***
- **Imports and exports of used electronic and electrical equipment (EEE) and e-waste**
- **Enforcing international, regional and national law**
- **Design of a system for environmentally sound management of e-waste**
- **Financing environmentally sound management of e-waste**
- **Environmental and social-economic aspects of e-waste management**
- **Capacity-building and training**

NB : 2ND PAN AFRICA E-WASTE FORUM IS SCHEDULED FOR 2016 IN NAIROBI, KENYA.

Recommendations

- The lack of infrastructure and appropriate regulatory framework, low public awareness, adverse socio-economic as well environmental and human health impacts arising from unsound management of e-waste are well known. Developing and implementing effective solutions that create green jobs and alleviate poverty without risk to human health and the environment should be undertaken by government in partnership with OEMs and other stakeholders.

- The Africa vision on ESM of e-waste and the call for a set of 8 priority actions on e-waste in Africa by the First Pan African Forum on e-waste in 2012 should be embodied in regional and national policy, strategies, and action plans for effective implementation to achieve ESM based on life cycle.

- The export of used e-products to Africa and other developing countries compliant with Basel Convention PIC procedure should not be banned but controlled; as it provides opportunities for employment, poverty alleviation, recycling business, promote North –South and South-South economic and technological cooperation, and bridging the digital divide. The present loopholes and

Recommendations

- **Consequently the EU- African Network on the control of illegal import of E-waste established based on the SBC e-waste Africa project should be invigorated with instituional strenghtening and capacity building of customs officers, environmental regulators and officers of ports authorities; and supported as a good example of north-south cooperation in providing solutions to global TBM problem of E-waste as well as active participation of African countries in the recent global nettwork ''ENFORCE'' .**
- **Pilot projects on Sustainable Collection, Repair/Refurbishment, Dismantling , and Recycling with capacity building component for Africans especially the informal sector, in partnership with OEMs and funding support from UNEP, development partners including African Development Bank, World Bank, other banks, etc investors should be implemented with involvement of Basel Regional and Coordinating Centres.**
- **Capacity building should be provided to Arab countries and appropriate institutions to promote ESM of e-waste in partnership with BCRCs and BCCC in Africa and Arab region**

Recommendations

- There should be innovative thinking on e-waste management and a paradigm shift to resource management such that we think of ''**How do we handle our discarded resources which do not deprive future generations of some, if not all of their values'' in line with the Basel Cartagena Declaration on waste as a resource and Rio+20 report on the future we want.**
- **Africa and Arab regions should take full advantage of the economic and entrepreneurship potentials of e-waste in an environmentally sustainable manner with implementation of Extended Producer Responsibility (EPR) including '' Take back schemes '' backed by legislation and exploration of ''Urban Mining''**
- **Government in partnership with OEMs and other investors should develop the best sustainable business model for e—waste based on ESM and life cycle approach.**
- **Domestication of Basel, Basel Ban Amendment and Bamako Conventions and their effective implementation should be accorded priority to minimize illegal traffic in e-waste. Review of Bamako Convention to remove barrier to import-export of e-waste within Africa countries should be urgently addressed if effective and unhindered regional solution is to be achieved.**

- **E-waste is a perfect product exemplifying synergy within the BRS MEAs as it is both hazardous waste and contains Stockholm POPs.**
- **Substance and material flow analysis(SFA/MFA) studies have shown importation of BFRs especially PBDEs contained in e-waste plastic with the waste, may be disseminated and released into the environment with human exposure during the recycling or crude processing of e-waste plastic containing POPs in the informal sector as the technology for the removal of BFRs from WEEE plastics before recycling is unavailable in Africa**


Help keep electronic waste from growing.

THANK YOU FOR KIND ATTENTION