

E-waste Management Practices in the Arab Region: Status and Opportunities

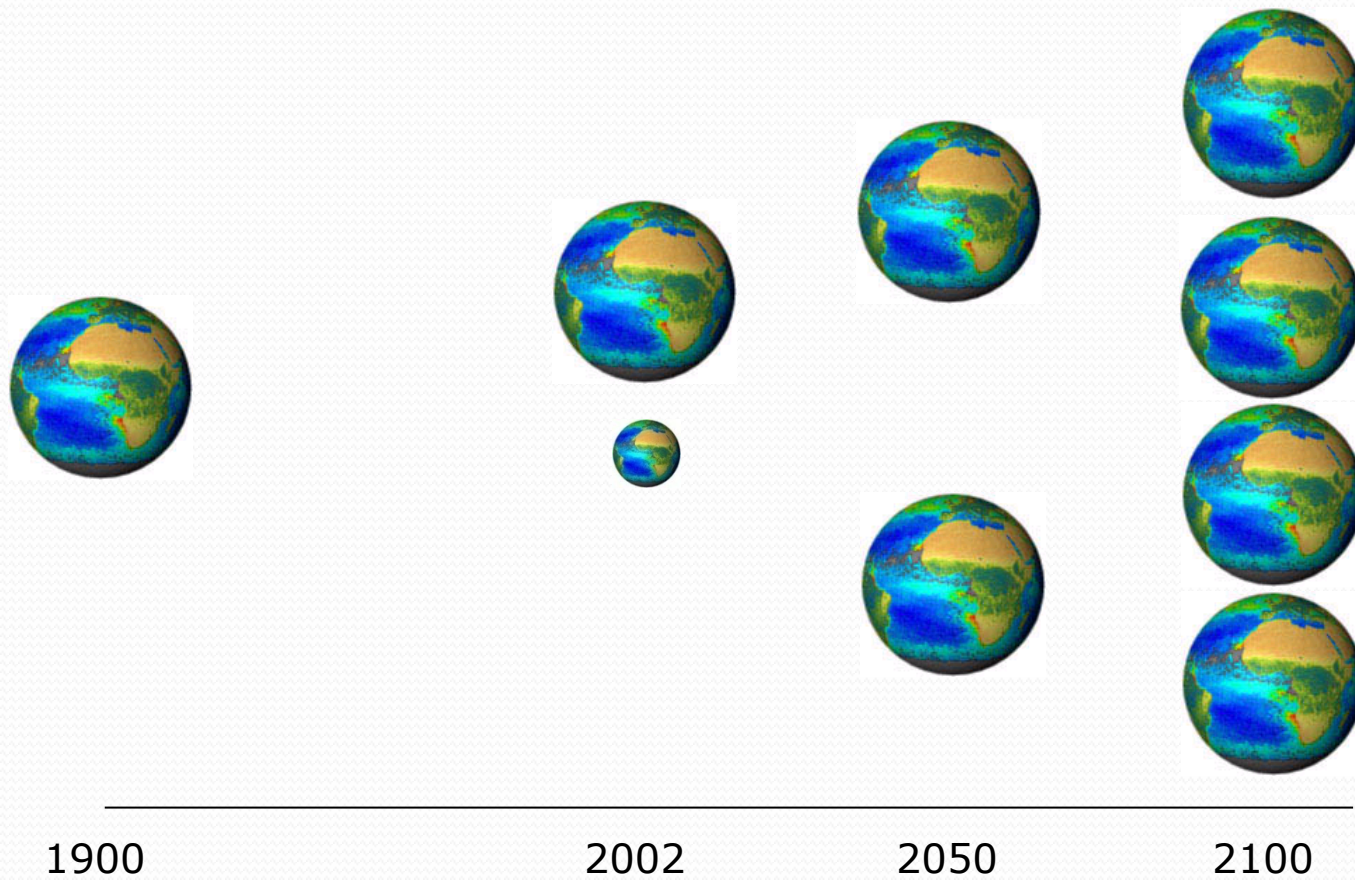
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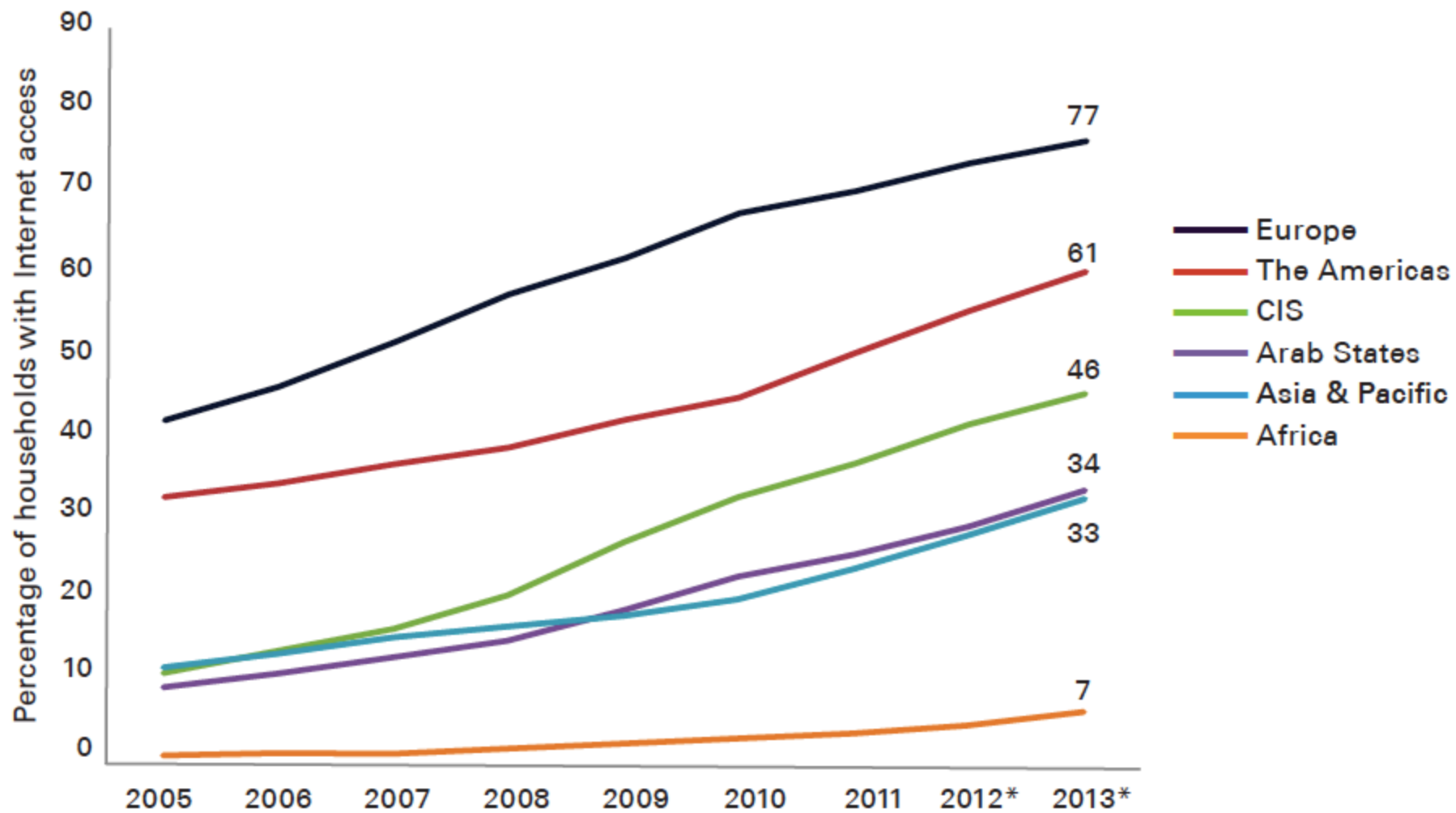
Current Consumption Rates Patterns

Two planets are needed by 2050





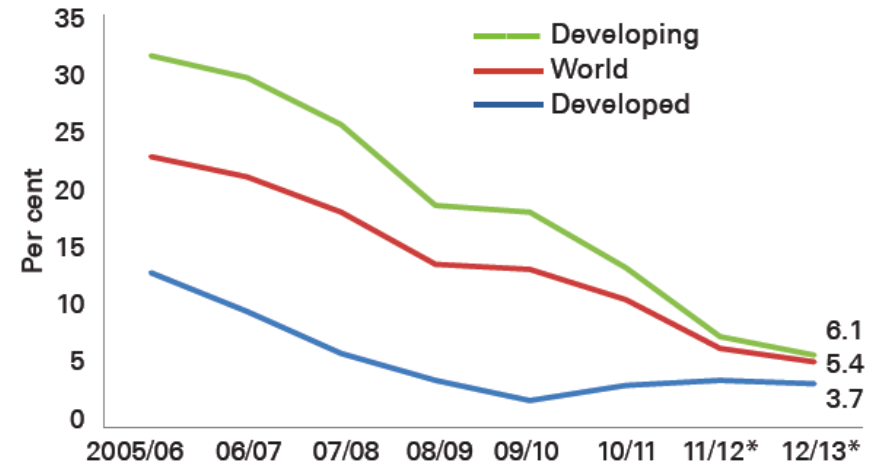
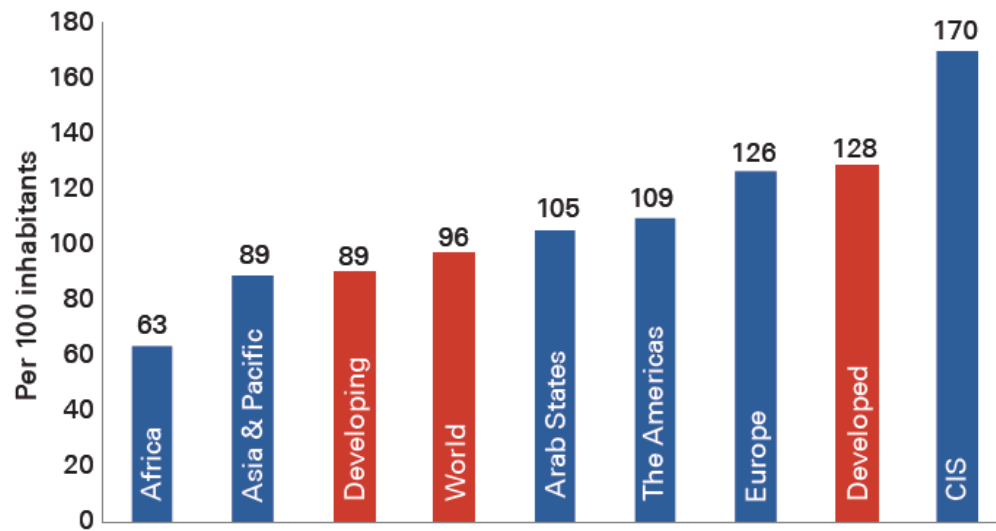
ICT Facts and Figures



Source: ITU World Telecommunication /ICT Indicators database

Note: * Estimate

Mobile-cellular penetration, 2013*, and mobile-cellular subscription growth rates, 2005-2013*



Source: ITU World Telecommunication /ICT Indicators database

Note: * Estimate

CONTINUOUS HIGH GROWTH OF MOBILE BROADBAND

More than 2 billion subscriptions worldwide by end 2013*

Americas

460 million subscriptions

48% penetration

28% CAGR (2010-2013)

Europe

422 million subscriptions

68% penetration

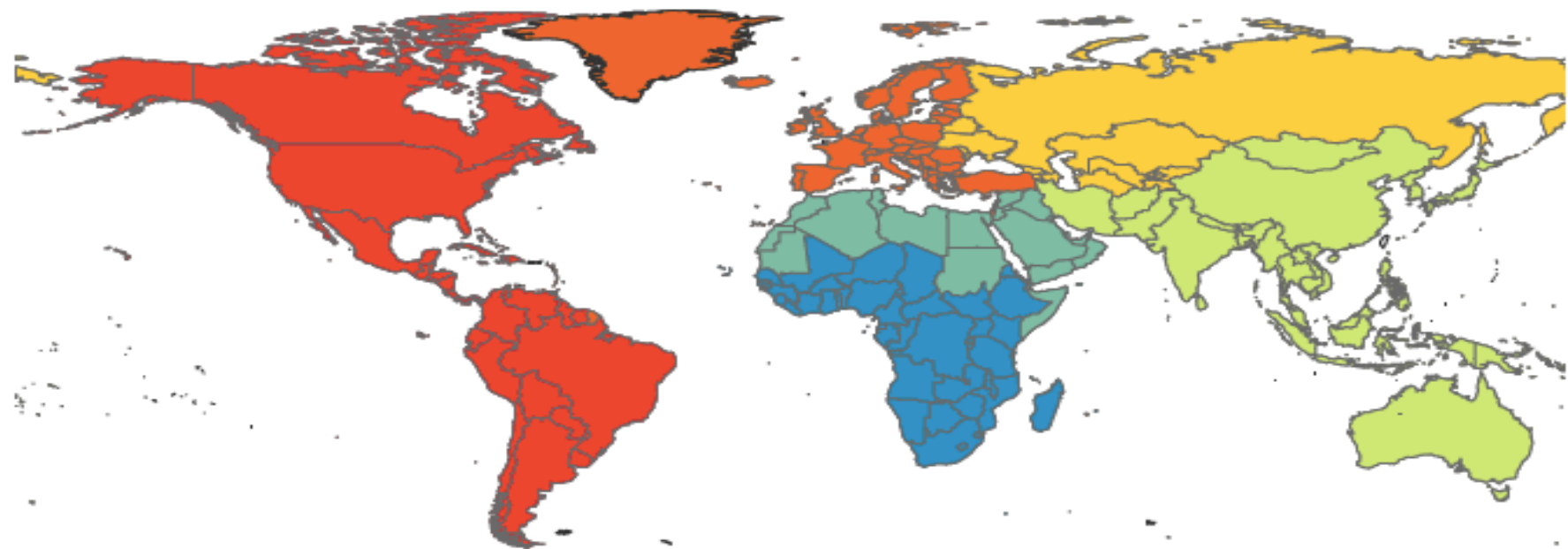
33% CAGR (2010-2013)

CIS

129 million subscriptions

46% penetration

27% CAGR (2010-2013)



Arab States

71 million subscriptions

19% penetration

55% CAGR (2010-2013)

Africa

93 million subscriptions

11% penetration

82% CAGR (2010-2013)

Asia-Pacific

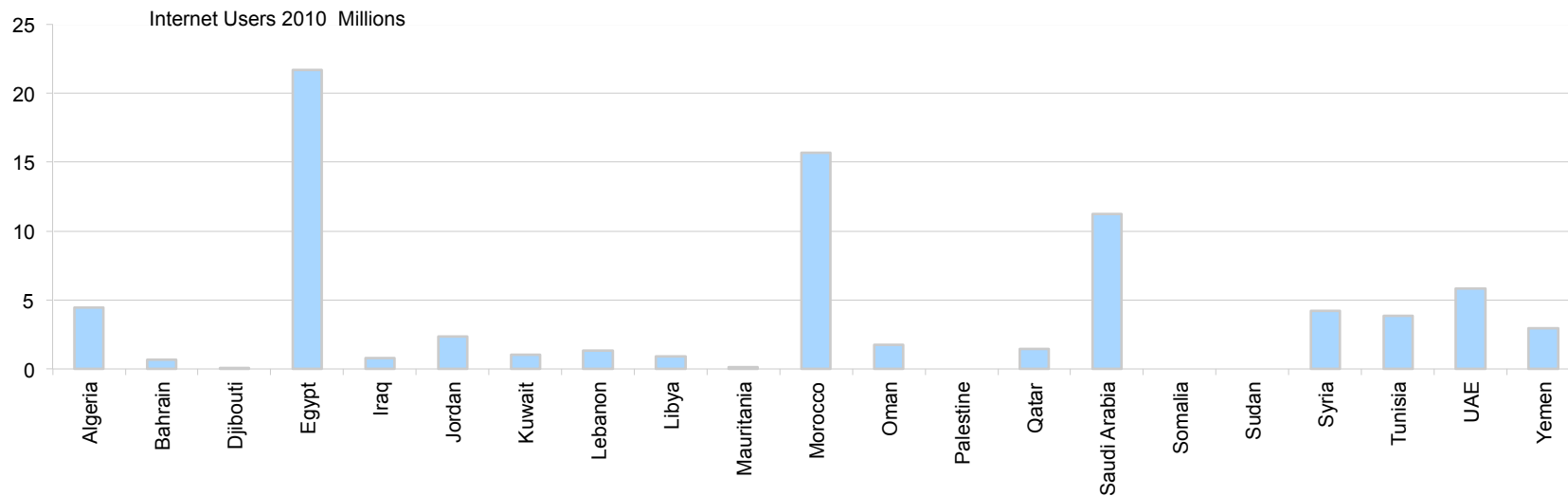
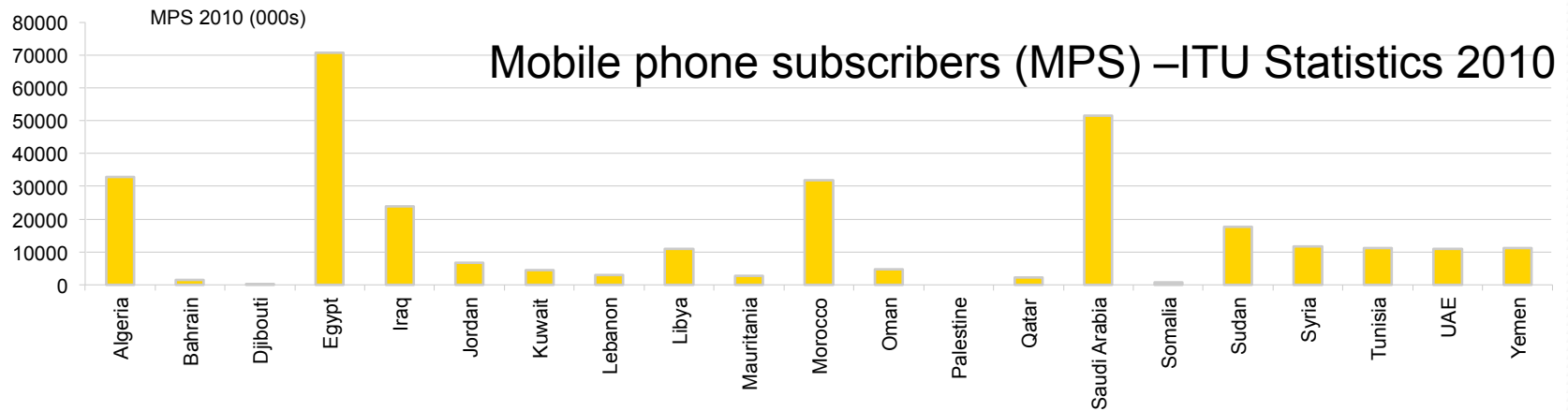
895 million subscriptions

22% penetration

45% CAGR (2010-2013)

Source: ITU World Telecommunication /ICT Indicators database
Note: * Estimate

ICT Industry in the Arab Region



Internet Users(Millions), World Bank Data and Indicators 2010



Challenges

- Volumes
 - Increasing sales of EEE, decreasing lifetimes
 - ~40M tons e-waste generated worldwide
 - EU in 2007: ~2.5M tones recycled, 8.3 - 9.1M tons generated (EMPA)
- Material Content
 - Valuable and energy-intensive precious metals
 - Toxic materials

Environmental & occupational safety problems

Ramifications:

- Toxic emissions from burning
- Soil & water contamination from chemical disposal
- Inefficient recovery of precious metals

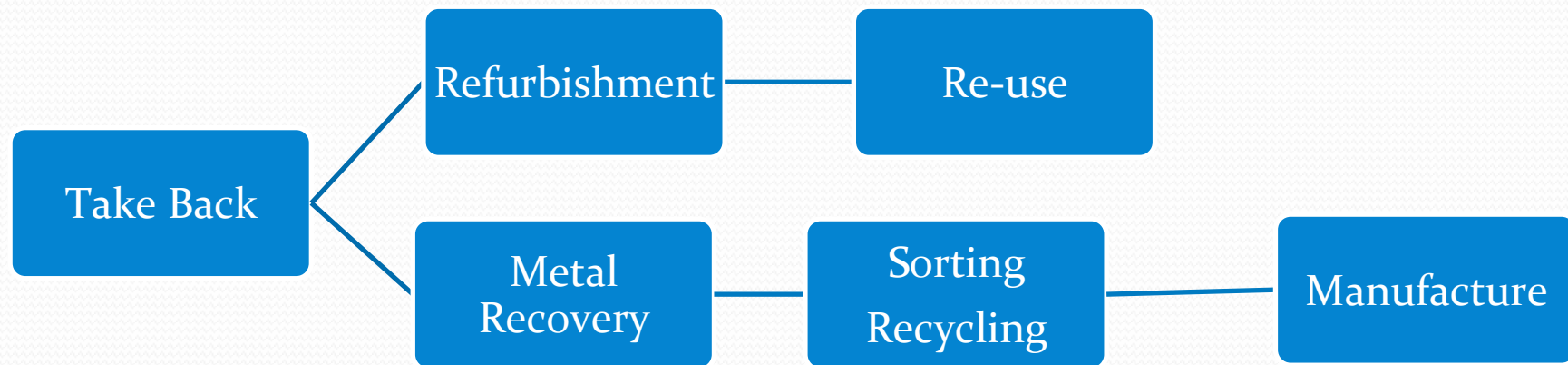


Material	Occurrence in E-waste	Health and Environmental Impact
Beryllium (OECD 2003, Taylor et al. 2003)	copper-beryllium alloys, springs, relays and connections;	<ul style="list-style-type: none"> beryllium sensitization/chronic beryllium disease human carcinogens released as beryllium oxide dust or fume during high temperature metal processing
Cadmium	Contacts, switches, nickel-cadmium (Ni-Cd) batteries, printer inks and toners	<ul style="list-style-type: none"> persistent and mobile in aquatic environments (ATSDR 2000) damage to the kidneys and bone toxicity, released if plastic is burned or during high temperature metal processing
Lead	Circuit boards/ cathode ray tubes CTR (1 – 3 kg per CRT);	<ul style="list-style-type: none"> Risk for small children and fetuses Damage to the nervous system, red blood cells, kidneys and potential increases in high blood pressure; Incineration can result in release to the air
Mercury	Lighting devices that illuminate flat screen displays, switches and relays	<ul style="list-style-type: none"> Impacts the central nervous system Land filling and incineration of flat panel displays results in the release to the environment
PCBs (polychlorinated biphenyls)	Insulating fluids for transformers and capacitors, flame-retardant plasticizers	<ul style="list-style-type: none"> Suppression of the immune system, liver damage, cancer promotion, damage to the nervous system Damage to reproductive systems

Some Facts

- One ton of Gold (45 M Euros) can be extracted from 17,000 tons of E-waste or 200,000 tons of gold mines dust
- One ton of recycled cell phones can generate up to 230 grams of gold

Electronic Waste Life Cycle



E-waste Management Activities Survey in the Arab States

- National Authorities
- Private Sector Enterprises
- NGOs
- Non-Arab Enterprises



E-waste Management Activities

- Algeria
 - Assessment of E-Waste and E-Waste Recycling Facilities 2006 – 07, BCRC
- Egypt:
 - MCIT and MoE: launching “Green ICT” Initiative
 - Egyptian Electronic Recycling Co. (EERC) is the first electronic equipment recycling facility in Egypt
 - Spear Ink is a pioneer in inkjet and toner environmental friendly refilling and remanufacturing

E-waste Management Activities

◎ Jordan

- UNEP/Basel-PACE: Recycling of used computers
- Assessment of E-Waste and E-Waste Recycling Facilities, 2006 – 2007, BCRC
- Project of re-using computers, Jordan Environment Society (JES)

◎ Morocco

- Managem : E-waste treatment plant
- Managem and Al-Jisr: “GREEN CHIP” Project for collection of used digital equipment and E-waste recycling
- CMPP: Assessment of the current situation in Morocco, 2007

E-waste Management Activities

- **Syria**
 - Temporary E-waste disposal facility (2007)
- **Tunisia**
 - Recycling facility is operating, Anged
 - Collection and transfer of E-waste with a capacity of 1000 tons/year
- **Yemen**
 - Proposed project for compiling an E-waste/ Inventory(2011)

	Legal Framework	Inventory	Collection	Recycling & Reusing Technology
Level 1 – LOW	No legal framework, strategy, or norms	There is no inventory	There is no collection	There is no recycling/reusing mechanism
	Iraq, Kuwait, Lebanon*, Syria, Yemen	Egypt, Iraq, Jordan, Lebanon*, Kuwait	Egypt, Iraq, Jordan, Lebanon*, Yemen	Iraq, Kuwait, Syria, UAE*, Yemen
Level 2	There is only plan to develop legal framework	There is the inventory for municipal solid waste, but no designated inventory for E-waste.	E-waste is locally collected by local recyclers, scavengers, etc. without any legal framework. Only recyclable E-waste is well collected	Only recyclable and reusable E-waste is recycled and reused by local stakeholders
	Bahrain, Egypt, Syria	Bahrain, Syria, UAE*, Yemen	Kuwait, Syria, UAE*	Jordan
Level 3	A legal framework is being prepared and will be issued/enforced in very near future	E-waste inventory is being prepared	E-waste is well collected by local collection mechanism. Pilot separation and collection systems have been setup	There is a plan to set up E-waste facility
	Jordan, Tunisia*, UAE*		Tunisia*	Bahrain, Egypt
Level 4	Enforcement, but the legal framework is not well conducted	E-waste inventory is conducted, but lack of information and data	Collection system for E-waste is operational and includes environmentally sound disposal	There is E-waste Recycling facility, but not achieve to full operation for all E-waste in the country
		Morocco*, Tunisia	Bahrain	
Level 5 – HIGH	Full enforcement and model legal framework for other countries	E-waste inventory is fully conducted and available on website	Collection systems are fully operational. Our collection is recognized as a model system by other countries	E-waste recycling facility is fully operated for all E-waste in the country and the model as the stat oft the-art recycling facility
				Tunisia*



Potential Areas of Cooperation

- **Enhance Awareness**
- **E-waste Status: Quantity and Type**
- **Establishing Legal Framework**
- **Pilot Projects**
- **Sustainable Business Solutions and Infrastructure**



E-waste Management Programme

- *Work Package 1: Rapid Assessment of E-waste in the Arab Region*
- *Work Package 2: Establish Multi-stakeholder Partnership for E-waste Management*
- *Work Package 3: Implement Awareness Campaign about E-waste Threats and Opportunities*
- *Work Package 4: Develop and Enhance capacities for Environmental Friendly E-waste management System*
- *Work Package 5: Establish E-waste Recycle Trading System*

CEDARE's E-Waste Activities

- Knowledge Sharing and transfer
 - StEP Initiative: Regional Focal Point for Middle East and North Africa and elected Steering Committee Member
 - Technical Secretariat for the Arab Region E-waste Group
 - E-waste Management Forum
 - E-waste 2009: 9-10 February 2009, Cairo, Egypt
 - E-waste 2010: 23-24 November 2010, Marrakech, Morocco
- E-waste Assessment
 - E-waste Management Practices in the Arab Region (CEDARE and UNEP) 2008 – 2010
 - CEDARE and EMPA Team for E-waste Assessment

CEDARE's E-Waste Activities

- Capacity Building
 - E-Learning Course: Introduction on E-waste Management (eacademy.cedare.int)
 - E-Learning Course: How to create collection and dismantling centre
- Technical Assistance
 - Provide expertise to governmental organizations and ICT private sector enterprises.
 - SECO/EMPA Inception Report for E-waste management needs in Egypt
 - “Global circular economy of strategic metals - best-of-two-worlds approach (Bo2W) - Germany”

Ewaste Global Survey



- The aim of this survey is to collect necessary data to inform about the e-waste issue, the respective policies and standards
 - Quantities
 - Activities
 - Policies

Global Circular Economy of Strategic Metals - Best of two worlds approach (Bo2W)



Further information about the project can be found:
[http://www.resourcefever.org/project/items/
global_circular_economy_of_strategic_metals.html](http://www.resourcefever.org/project/items/global_circular_economy_of_strategic_metals.html)

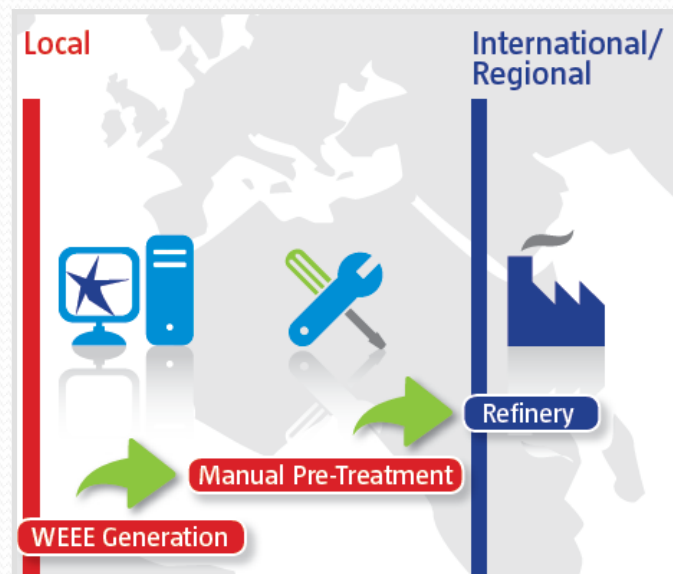
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The Bo2W Approach

International co-operation to combine strengths of recycling systems in developing countries with those of industrialised countries



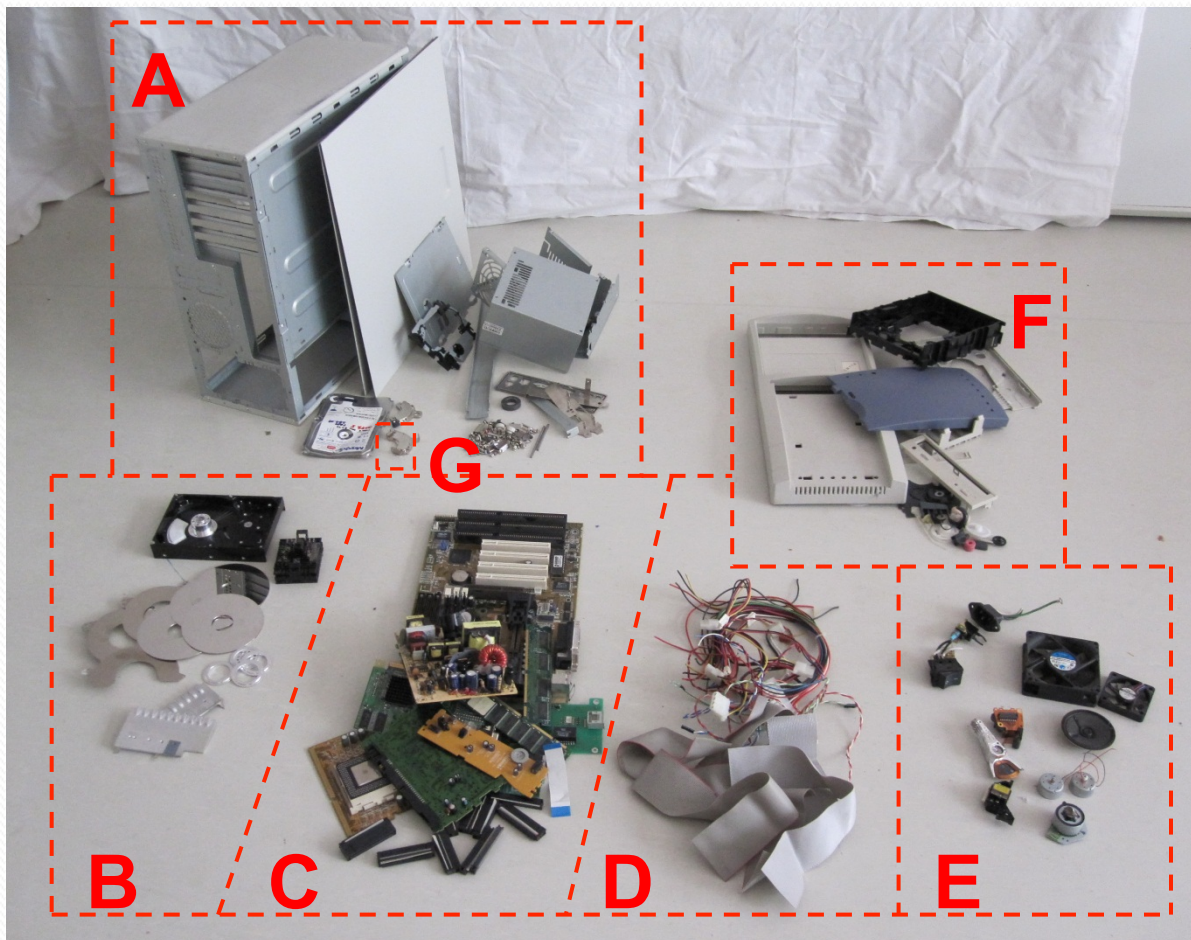
Benefits:

- Improved management of hazardous substances
- Increased resource efficiency / closed material cycles
- Reduced GHG emissions
- Growing income and employment generation in Egypt and Ghana
- Increasing investments in social & environmental standards

The Bo2W Approach

Example:

Solution for Information and Communication Technologies (ICTs): the key factor is careful dismantling and separation



- A: Steel scrap
- B: Aluminium scrap
- C: Printed circuit boards
- D: Cables
- E: Copper-steel scrap
- F: Plastics
- G: Magnets

'Sustainable Recycling Industries'

- Switzerland was supporting knowledge partnerships in e-waste recycling with developing countries since 2003
- 2013 – 2017: follow-up programme “Sustainable Recycling Industries” by SECO together with Empa.
- Engages in three areas:
 1. Secondary raw materials stewardship (global): Promoting international policies and standards for secondary resources
 2. Recycling Initiatives (Colombia, Egypt, Ghana, India, Peru and South Africa): create local capacities for sustainable recycling industries
 3. Life Cycle Inventories (Brazil, Egypt, India, South Africa): Build local capacities and LCI datasets



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Federal Department of Economic Affairs FDEA
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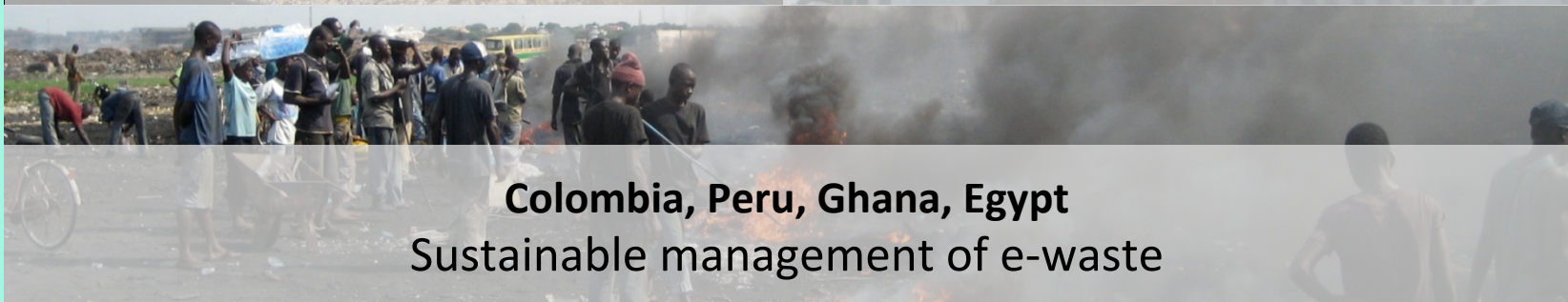
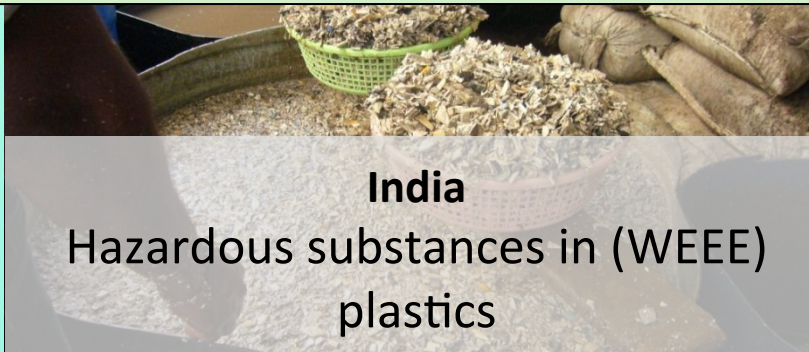


Materials Science & Technology

The new programme engages in

Secondary raw materials stewardship (global)

Recycling Initiatives



Life Cycle Inventories (Brazil, Egypt, India, South Africa)

The SRI Egypt project addresses the e-waste challenges through a multi-stakeholder process



- Local partners (CEDARE) with support of Empa and under consultation of the stakeholders related to the Egypt Green ICT Initiative, executed a “Needs assessment of the e-Waste Sector in Egypt”
- Planned activities include:
 - **Conformity Assessment:** aims at introducing recycling standards and initiates the conformity assessment system.
 - **Technology Partnerships:** aims at implementing a 'youth incubator programme' for e-waste recycling in the informal sector, providing financial, administrative, legal, and technical support.
 - **Financing Mechanisms:** aims at developing incentive mechanisms under the principle of Extended Producer Responsibility (EPR).

Thank you

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