

ITU Toolkit on Environmental Sustainability for the ICT Sector

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Purpose of the toolkit



Detailed practical support on how ICT companies can build sustainability into their operations and management

Ongoing contribution to ITU-T Study Group 5 which has the goal of developing global standards in this arena

Standardized checklist of sustainability requirements specific to the ICT sector

Why the toolkit matters

Current performance

- ICT industry represents around 2% of worldwide emissions

Emissions growth

- Under BAU conditions, ICT footprint grows at 6% CAGR

Enabling influence

- ICT enables energy efficiencies of 7.8 GtCO₂e (15% of all emissions)

Although its own emissions are rising, ICT's largest influence is expected to be through enabling increased energy efficiencies and energy use reductions in other sectors. The toolkit enables the ICT industry to drive environmental best practice into its own performance.

Collaboration with over 50 partners

- 3p Institute for Sustainable Management
- Alcatel Lucent
- BBC
- BIO Intelligence Service
- BT
- CEDARE
- Climate Associates
- ClimateCHECK
- Cogeco Cable
- DATEC Technologies
- Dell
- Ernst & Young
- ETRI
- ETNO
- ETSI
- European Broadcasting Union
- France Telecom/Orange
- Fronesys
- Fujitsu
- GHG Management Institute (GHGMI)
- Hewlett-Packard
- Hitachi
- Huawei
- IBI Group
- Imperial College
- Infosys
- International Telecommunication Union (ITU)
- Mandat International
- MicroPro Computers
- Microsoft
- MJRD Assessment Inc.
- National Inter-University Consortium for Telecommunications
- Nokia Siemens Networks
- NEC Empowered by Innovation
- NTT
- Panasonic
- PE INTERNATIONAL AG
- Research In Motion
- Scuola Superiore Sant'Anna of Pisa
- Step Initiative
- Telecom Italia
- Telecommunications Networks and Telematics Laboratory
- Telecommunication Technology Committee
- Telefónica
- Thomson Reuters
- Toshiba
- United Nations Environmental Programme
- United Nations Environmental Programme Basel convention
- United Nations University
- University of Genova
- University of Zagreb
- Verizon
- Vodafone Ghana



Toolkit content

Document	Summary
Introduction to toolkit	A business-led perspective on the use of sustainability in ICT organizations
Sustainable ICT in corporate organizations	Sustainability issues with the use of ICT products and services
Sustainable products	Sustainability-led design principles and practice for ICT products
Sustainable buildings	Sustainability management of the construction, use and decommissioning of ICT buildings
End-of-life management	Support in dealing with the various end-of-life stages of ICT equipment
General specifications and KPIs	Environmental KPIs that can be used to manage and evaluate sustainability performance
Assessment framework	Mapping the standards and guidelines applying to the ICT industry

Toolkit on End-of-Life Management of ICT Equipment



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- Gilbert Buty and Thomas Okrasinski (Alcatel Lucent)

THANKS:

- Microsoft
- Verizon

Purpose

- Aims to give directions on how to find an environmentally sustainable solution for EOL equipment by providing a checklist that allows full monitoring of the decisions made in relation to ICT EOL.
- To present different initiatives for ICT equipment's End of Life management solutions.
- Identify social, economic and environmental aspects related to End of Life management of ICT equipment.
- Illustrate how the end-of-life management and its environmental aspect can be integrated into the design process as part of the life-cycle approach within the framework which is developed by the ITU-T Study Group 5 (SG5).

The Document

- **End of Life Management**
- **General Material Recovery and Recycling Facility Guidelines**
- **Clean Supply Chain and Conflict Minerals**
- **Socio – Economic Issues**
- **Offsetting Opportunities and Mitigation**
- **Case Studies**
- **Checklist**
- **Conclusions - Suggestions**

End of Life Management

- Definition of End-of-Life for ICT Equipment: Advises on the need to conduct functionality tests.
- Definition of Environmentally Sound Management of E-Waste

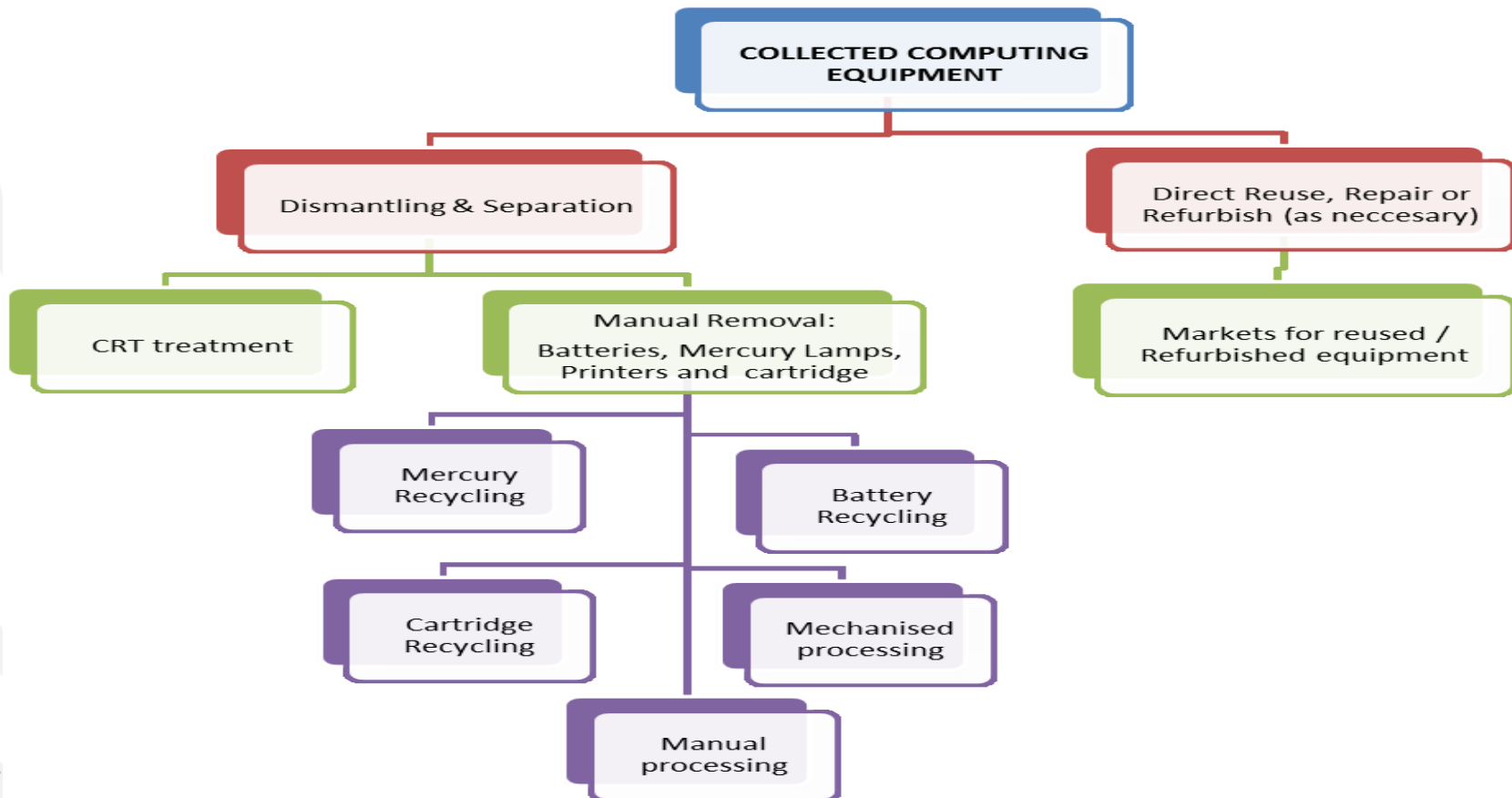
E-WASTE: “Any device that for functional reasons is dependent on electric currents or electro-magnetic fields in order to work properly. It becomes e-waste when the holder discards, intends or requires to discard”

- General description of the end-of-life management chain for ICT equipment
- Transboundary Movements of Hazardous Wastes and Other Wastes
- End-of-Life Management: Stages and Waste Hierarchy

General Material Recovery and Recycling Facility Guidelines

- Environmental Management System, Licences & Permits
- Monitoring and Record Keeping
- Emergency Planning
- Occupational Health and Safety: Best Practices to Ensure Workers' Safety
- Personal Protective Equipment
- Employee Training
- Financial Guarantees

Example of End of Life Management processing for Computing Equipment



Checklist

Life cycle phase	Facet	Considerations	Comply Y/N	Aspect(s) impacted	Description of impact, nonconformity or improvement actions to be taken
General material recovery and recycling facility guidelines		Skin protection: In certain conditions, such as working in proximity to furnaces, chemical equipment and some types of automated equipment, a fire-resistant work smock may be necessary to protect exposed skin from burns or chemicals.			
		Foot protection: Steel-toed shoes should be worn to prevent foot injuries from falling objects, pallet jacks, chemical spills, etc.			
		Hearing protection: Earplugs should be worn in work areas where prolonged noise exposure would lead to hearing damage.			
		Respiratory protection: Dust masks or face masks should be worn in areas where there is a risk of dust inhalation.			
	Employee training	Is employee training, being recorded, signed and tracked?			
	Financial guarantees	Has the company acquired the insurances needed to protect, assets, employees and equipment handled including during transportation?			

Clean Supply Chain and Conflict Minerals

- **Closing the loop** on e-waste by introducing or reinserting precious and rare metals recovered or recycled from the unwanted ICT equipment to the supply chain represents an **opportunity** for manufacturers to:
 - Ensure a clean supply chain
 - Reduce the demand on limited natural resources, which is auditable, measurable and tractable;
 - Reduce production costs of brand new product
 - Influence customer's purchasing power by offering a product that is verifiable conflict-free.

Clean Supply Chain and Conflict Minerals

- **Manufacturers can support recyclers ` efforts to recover material by:**
 - Designing products that through their different life -cycle stages reduce environmental impact and waste generation. ([See Sustainable Products - Designing for End-of-Life Treatment](#))
 - Designing, producing, labelling and commercialising equipment that have has a reasonable extensive life and can easily be repaired or dismantled for reuse or its value recovered without influencing economic growth.

Socio – Economical Issues

- **Developing countries main challenges in relation to e-waste:**
 - Imported non- functional / non - repairable equipment as second-hand with very short life span, as well as domestically generation is rising.

- **Positive and Negatives effects** depending on whether the EOL management of ICT equipment is managed responsibly or not.

- **Efforts need to focus on:**
 - Stopping unlawful competition of traders who calling themselves “recyclers” offering large economic benefits but no guarantees for the EOL management

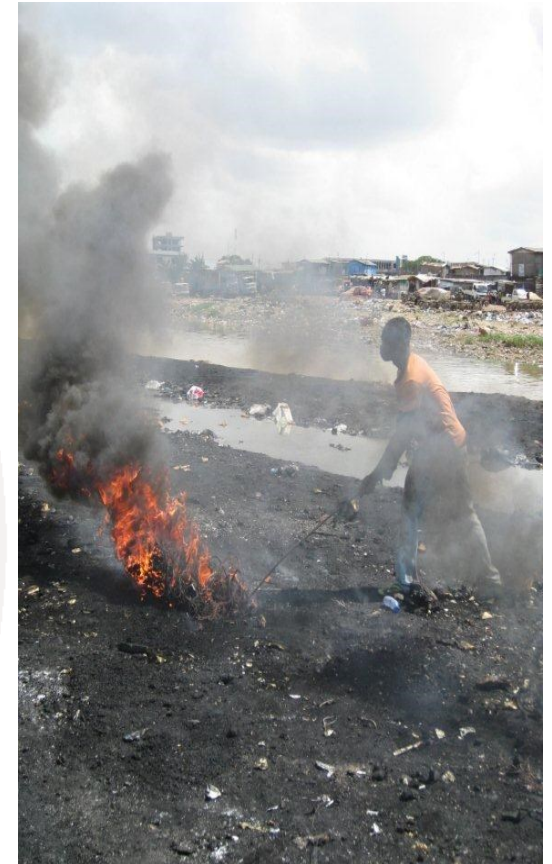
 - Development and adoption of policies, legislation and standards to support sustainable jobs creation and use of technology for environmentally sound management of EOL ICT equipment.

 - The importance to regulated refurbishing and reuse practices in developing countries to support the protection of global community and limit the operations of unlawful players on the market

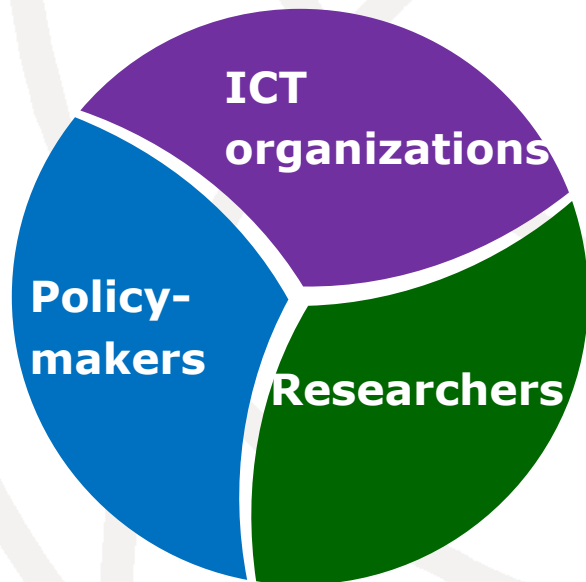
 - Ghana Case Study.

Offsetting Opportunities and Mitigation

- Corporate Social Responsibility
- CO2 Management:
 - Allowing the e-waste recycling industry to actively participate in the to carbon markets.
 - Enabling project-based offsets for different stakeholders
 - Enabling project-based offsets for different stakeholders for setting up a take back scheme in a country without legislative obligations.



Who benefits?



Support on how companies can build sustainability into their operations and management

Standardized approach to measuring the environmental impacts of an ICT organization

Assistance on the issues that a national policy framework would need to include

More information

- ITU-T & Climate Change: <http://www.itu.int/ITU-T/climatechange/>

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- Toolkit : <http://www.itu.int/ITU-T/climatechange/ess/index.html>



Additional Information

Sustainable ICT in corporate organizations

The main sustainability issues that companies face in using ICT products and services in their own organizations, with a special emphasis on four areas.



Data centers

Desktop infrastructure

Broadcasting services

Telecommunications
networks

Sustainable ICT in corporate organizations

Structure of the analysis:

- General Principles
- Drivers impacting energy efficiency
- Guidelines on sustainability
- Best practices
- Case studies
- KPIs
- Sustainability check-lists
- Future innovation

Four areas of sustainability analysis:

- **Data centers:** Extensive sustainability metrics around energy efficiency criteria – business drivers that push new metrics
- **Desktop infrastructure:** Managing the energy impacts of individual desktops, based on user profiles and group-wide policies
- **Telecoms and networking infrastructure:** different approaches and metrics needed to manage the particular sustainability impacts of data networks, fixed line and mobile infrastructure
- **Broadcasting:** the industry has only recently started using sustainability metrics and management approaches – we identified best practice cases they can build on.

Sustainable products

Supports the aim to build sustainable products through the use of environmentally-conscious design principles and practice.



Product development

Manufacture

End-of-life treatment

Sustainable products

Structure of the analysis:

- General Principles and Guidance
- Specific Guidance
- Product Value / Lifetime Extension
- Energy Efficiency
- Substances and Materials
- Emissions
- Batteries
- Product Packaging / Packing
- Designing for End-of-Life Treatment
- Checklists
- Metrics

Three areas of focus:

- **Network infrastructure equipment**
- **Customer premises equipment**
- **Life Cycle assessment**

Key criteria used to select the guidance principles and best practices:

- **Designer-based:** the principle / practice is within the scope of a product designer
- **Actionable:** the principle / practice proposes a means for improving the design
- **Broad-ranged:** the principle / practice applies to a broad range of products within the ICT sector
- **Best-in-Class:** the principle / practice focuses on creating the best solution possible

Sustainable buildings

Technical guidance on environmentally conscious design, maintenance, repair and operating principles and best practices as to how ICT companies build, operate and maintain their physical facilities.



Design and build

Maintenance, repair and operations

Building improvement and renovation

Technical buildings and outside plant

Sustainable buildings

Best Environmental Practices

- Design and Build Specifications
- Maintenance, Repair and Operations
- Renovations
- Technical Buildings -Data Centers
- Life Cycle
- Case Studies
- Checklists
- Metrics

Key criteria used to select the guidance principles and best practices:

- **Design:** Most environmental benefit can be realized if integrated within the design phase
- **Regional:** Environmental benefits can be better realized if designs are based on regional requirements.
- **Operations:** Environmental benefits can be lost if operations are deviate from design requirements
- **ICT:** ICT solutions are key to measure, monitor and control building operations

General specifications and KPIs

Matching environmental KPIs to an organization's specific business strategy targets



Environmental KPIs

Processes for KPI definition

Defining environmental targets

General specifications and KPIs

Structure of analysis

- Global initiatives for environmental KPIs
- Sector-specific initiatives for environmental KPIs
- Data collection and verification
- Analysis and target setting
- Eco-efficiency targets
- ICT enabling effect targets
- Communication targets

KPI sources:

- **Global sources:** Carbon Disclosure Project / Dow Jones Sustainability Index / GHG Protocol / Global Reporting Initiative
- **Sector-specific initiatives:** ETNO / ETSI / The Green Grid / GSMA / IEC / ITU-T
- **KPI target processes:** Definition of KPIs / Listing of relevance KPIs / Data verification / Types of targets



Assessment framework

Review of environmental management standards and guidelines; establishment of an assessment framework for energy/greenhouse gas intensity and environmental impacts of the ICT sector according to various assessment criteria and assessment targets

Standards and guidelines

Assessment targets

Assessment criteria

Overall framework

Assessment framework

Review of relevant standards and guidelines

- ISO TC 207
- ITU-T
- GHG Protocol
- IEC TC 111
- BSI
- EC-JRC
- JRC-IES
- ETSI
- IAASB



Assessment framework:

- **Assessment targets:** Products / Organization / Projects / City / Country
- **Assessment criteria:** Inventory / carbon footprint / life cycle assessment / ICT enablement accounting / product eco-design / labelling / validation and verification
- **Assessment framework:** Standards map of ISO standards / standards map of GHG standards