

Ministry of State for Environmental Affairs

CEDARE



Ministry of Communications and Information Technology

Needs Assessment of the E-Waste Sector in Egypt

Submitted by:

Centre for Environment for the Arab Region and Europe (CEDARE)

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This document is produced within the framework of the National Egyptian Green ICT Strategy, and in cooperation with the Ministry of Communications and Information technology (MCIT) and The Ministry of State for Environmental Affairs (MSEA)

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1 Introduction

This study is part of the inception phase of the Sustainable Recycling Industries (SRI) project being implemented by the Swiss Federal Laboratories for Materials Sciences (EMPA) as mandated by the State Secretariat of Economic Affairs (SECO) of Switzerland. This study is also an important contribution in the implementation of the multi stakeholder Green ICT Strategy of the Arab Republic of Egypt. It is the inception report for SRI prepared by the Center for Environment & Development in the Arab Region & Europe (CEDARE) as the local expert.

The trade promotion activities of SECO have so far focused on sustainability of (export) products, respectively production processes. In order to complement its trade cooperation by sustainability initiatives in the recycling sector, SECO has mandated EMPA to prepare and define the SRI program.

This comes in light of the increasing demand for secondary commodities witnessed today and the increasing importance of well-functioning global recycling systems. The major obstacles to be addressed are often the lack of data, lack of a consolidated legal framework, capacities and policies - particularly in developing and transition countries.

The development objective (aim) of the SRI programme is: "The sustainable integration and participation of small and medium enterprises from developing and transition countries in the global recycling of secondary non-renewable resources". The programme objectives are as follows:

1. **Policies and standards** for the sustainable management of secondary resources are internationally promoted, recognized and implemented in SECO partner countries.
2. **Local capacities** for sustainable recycling industries are created, aiming at competitive secondary resource recovery through environmentally and socially sound processes.
3. **Basic information** required to declare and compare the environmental and social life cycle performance for industrial activities along the reverse supply chains in developing and transition countries is available and used for enhancing sustainable trade schemes.

This study falls within the inception phase of the program and the framework of the National Egyptian Green ICT Strategy, and in cooperation with the Ministry of Communications and Information Technology (MCIT) and The Ministry of State for Environmental Affairs (MSEA)

1.1 Scope and Objectives

The study will focus on the hotspots of the WEEE handling and recovery industry in Egypt. The needs assessment will cover various public and private sector stakeholders and the civic sector including the informal industry and NGOs. Information will be retrieved through stakeholder interviews, questionnaires, and surveying existing literature.

The specific objectives are as follows:

- Summarize the current e-waste landscape,
- Identify key stakeholders,
- Describe current national strategy,
- Analyze the current situation,
- Recommend interventions.

1.2 Methodology

In order to meet the study objectives, the following steps were taken:

- A review of existing literature on the topic was conducted and initial identification of stakeholders to consult.
- A kick-off stakeholder consultation meeting was held in the Ministry of Communication and Information Technology (MCIT), with follow-up interviews.
- Questionnaires were distributed to identify stakeholders to assess previous relevant activities, plans, future prospects, and willingness to participate in developing the industry.
- Field visits were conducted to representative hotspots of the informal e-waste markets in Greater Cairo, for expert observation and direct interviews.
- Information on the mass flow and inventory of Electrical and Electronic Equipment (EEE) was collected through official correspondence with the Central Agency for Public Mobilization and Statistics (CAPMAS), the Ministry of Trade and Industry (MTI), and the Egyptian Customs Authority of the Ministry of Finance to inquire about local production, imports, and exports, as available.
- Analysis of the current situation was conducted based on findings.
- Recommendations were proposed based on an iterative process of analysis and stakeholders consultation to ensure that the interventions proposed are demand-driven.

2 Current Situation

Egypt hosts a population of 81 million[1]. According to CAPMAS, the country is experiencing continuous urbanization, having 43% of the population residing in urban areas. The population growth is approximately 2%. In the meantime, features of consumerist lifestyles are widespread. Adoption of ICT is on the rise with more than 76 million mobile phone services subscribers registered by June 2011 growing at a rate of 30%, while internet users have reached 26 million[2].

Table 1: Mobile Subscription and Penetration Indicators2

Indicator	Unit	June 2010	May 2011	June 2011	Monthly Growth Rate (%)	Annual Growth Rate (%)
Mobile Subscription	Million Subscription	58.97	74.77	76.43	2.22	29.61
Mobile Penetration *	%	76.16	93.16	95.07	1.91	18.92

*Mobile penetration here refers to the number of subscriptions of the total population.

Other indicators show the high penetration of other electrical appliances as well, such as the household TV penetration rate that reached exceding 90% in 2009 [3,4]. Furthermore, the local production of 782,000 air conditioners is recorded in the same one year, mostly destined to the local market[5]. The local production of various electrical appliances as available in CAPMAS is as provided in the following table:

Table 2: Local Production of EEE in Egypt (unit appliances)[5]

	Item	2007	2008	2009
1	Electric Grill	33224	31569	36550
2	Electric Kettle	59025	3552	20127
3	Computer	95288	78589	63708
4	Half Automatic Washing Machine	-	21657	26410
5	Electric Generator	1102	1238	1359
6	Electric Transformer (High voltage)	1113	4237	2733
7	Electric Transformer (Low voltage)	59440	166878	49157
8	Colored TV*	1268548	951375	858840
9	Video Cassettes	10150	4115	-
10	Cassette Recorders	14869	14728	-
11	Satellite Receivers	4313	-	-
12	Air Conditioners	543123	745862	782194
13	Electric Commercial Fridges	16017	34442	35338
14	Electrical Home Fridges	933402	992760	1585898
15	Deep Freezers	126697	213548	273220
16	Dish Washing Machines	132647	-	16014
17	Full Automatic Washing Machine	386009	501616	4285
18	Manual Washing Machine	215903	35539	562,24
19	Fans	2754221	3055710	2135100
20	Air Blowers	1146479	1311836	594706

[1] CAPMAS 2011: Homepage, Central Agency for Public Mobilization and Statistics. September 24, 2011. http://www.capmas.gov.eg/pages_ar.aspx?pageid=1029

[2] MCIT 2011: ICT Indicators in Brief, June 2011, Ministry of Communication and Information Technology. http://www.mcit.gov.eg/DocDetails.aspx?ID=526

[3] Ghannam J., 2011: Social Media in the Arab World: Leading up to the Uprisings of 2011**,** Center for International Media Assistance. September 5, 2011. http://cima.ned.org/sites/default/files/CIMA-Arab_Social_Media-Report_2.pdf

[4] Dataxis news (2010): Television penetration to reach 50% of African households in 2015. Dataxis news website, Feb.23, 2010. http://www.dataxisnews.com/?p=12282.Accessed: Oct.10, 2011.

[5] CAPMAS data, 2011, obtained through official correspondance.

21	Vacuum Cleaners	304503	287711	101192
22	Mixers	616178	783999	915771
23	Egg Mixers	5243	7000	-
24	Electric Oven	168524	-	-
25	Hair Dryer	2733	-	-
26	Irons	552591	403115	246731
27	Electric Heaters for Drinks	1800	286900	10500
28	Water Heaters	569323	699660	808275
29	Air Heaters	659718	898935	27644
30	Microwave Ovens	5384	-	114

*Categorization of TV types not available.

From the table above, it was found that the items produced in greatest quantities over the past three years (above 2 million over the three years) are the following seven items in order:

- Fans
- Electrical Home Fridges
- Colored TV
- Air blowers
- Mixers
- Water Heaters
- Air Conditioners

There has not been a technical study looking into the impact of various products downstream their life cycle despite the large quantities implied by the size of local production. The information about total imports of EEE was requested during the course of this study from the Customs Authority through formal correspondence and interviews.

Investigations revealed that the Customs Authority only has records of the total import *value* of the products imported with no indication of quantities. Furthermore, there is no indication of the range of the average unit value or any averages.. Therefore, approximate calculated assumptions were made on the average price range of laptops and computers to at least indicate the order of magnitude likely implied by the data of the Customs authority. This led to indicating quantities of lap tops and computers expected to be in the following ranges[6]:

- 190-290 thousand laptops imported per year and
- 8-15 thousand desktop units per year respectively,
- Laptops and desktops imported constitute a total weight in the proximity of 1000 tons of imported EEE annually.

Furthermore, for the purpose of this inception phase, information was gathered from the UN commodities online database as provided in Table 3 and 4 in this section[7]. As shown in Table 4, the numbers (weights) were extrapolated. This was in reference to a field survey study of tracer products conducted previously in Nigeria. In that earlier study, tracer products were chosen based on consultation with local experts to identify relevant and widespread products and quantifiable through available records and statistics or field surveys. The extrapolation was based on the field survey to estimate the share of tracer products among the total of its respective category. Using the same figures for extrapolating the UNcomtrade data for Egypt, the extrapolated total is 30,538 tons[8].

[6] Assumptions considered the average lap top to cost 3000LE and average desktop computer to cost 5000LE.

[7] UN comtrade (2011). United Nations Commodity Trade Statistics Database website. Available from: http://comtrade.un.org/db/dqBasicQuery.aspx

[8] The ratio of the tracer products to the total of their respective categories are: Category 1 (Fridges, Air Conditioners), 34.90%, Category 2 (Irons, Kettles), 5.10%, Category 3 (PCs, Laptops, Mobile Phones) 41.10%, Category 4 (TVs, CRT and flat panel, radios, stereos), 69.30%.

This relatively low figure for imports (an order of magnitude less than Ghana[9]) suggests that the accuracy of data is questionable and needs further deeper investigation to understand the stocks and flows of EEE in Egypt. This doubt of UNcomtrade data was also confirmed by the Costums Authority as well during interviews[10].

Table 3: Imports of selected EEE products (unit items)

Item	2006	2007	2008	2009	2010
Category I: Large Household Appliances					
Refrigerator	425450	444591	428897	375065	266063
Air Conditioner	139178	2335387	259184	125004	59799
Category II: Small Household Appliances					
Iron	22	66	2	19	-
Kettle	286794	356097	443862	587193	333190
Category III: Information & Communication Technologies					
PC	78	326	766	351	23
Laptop	228	661	277	2025	179
Mobile Phone	-	1703	22992	27107	12715
Category IV: Consumer Electronics					
Television	97192	41310	115572	71910	75647
Radio & Hi/Fi	10381	20466	1200	2966	25689
Total Tracer	959323	3200607	1272752	1191640	773305

Table 4: Imports of selected EEE products (tons)

Item	2006	2007	2008	2009	2010
Category I: Large Household Appliances					
Refrigerator	4647.9	5855.5	9344.9	8327.2	4679.2
Air Conditioner	8877.6	15567.7	14463.7	5956.5	3145.3
Category II: Small Household Appliances					
Iron	18.4	11.4	8.8	15.4	-
Kettle	286.8	356.1	443.9	587.2	333.2
Category III: Information & Communication Technologies					
PC	0.7	10.2	2.8	1.2	7.7
Laptop	1.0	1.8	2.0	3.2	7.3
Mobile Phone	-	7.0	26.8	27.2	3.6
Category IV: Consumer Electronics					
Television	2991.5	2530.6	2279.7	1730.2	1034.2
Radio & Hi/Fi	10.9	15.1	3.0	3.2	33.0
Total Tracer	16,835	24,356	26,576	16,651	9,244
Extrapolated to total EEE	49,077	72,310	80,467	55,321	30,538

2.1 Policy & Legislation

There is no overall integrated environmental policy regarding WEEE in Egypt, but the legal framework in Egypt includes restrictions on imports of WEEE and restrictions by virtue of

[9] Mathias Schluep, Esther Mueller (2011). Inception Report Ghana (Draft) SECO "Sustainable Recycling Industries (SRI)" project (B1.1 needs assessment e- waste).
[10] Personal interview with Ms. Nagat Mostafa, General Manager of the Decision Support Department of the Egyptian Customs Authority.

commitments to international conventions, specifically the Basel Convention. The legal framework for solid waste encourages collection, recycling and material recovery practices. The legislations that have effects on WEEE are distributed among different governmental organizations such as Ministries of environment, trade and industry, and communication and information technology.

2.1.1 Law 4 of the Environment

The law that governs environmental protection in Egypt is Law No. 4 of 1994, and its amendment Law No. 9 of 2009 and its executive regulations. The law does not address or mention e-waste of any type. The Law however addresses wastes in a clear manner and implicitly addresses hazardous e-waste among other hazardous wastes described as hazardous and dangerous as per the following definitions:

Hazardous Materials:
Materials with hazardous characteristics which are harmful to man's health, or have a harmful effect on environment, such as toxic, explosive or inflammable materials, or materials with ionizing radiations.

Dangerous Wastes:
Wastes or ashes of different activities and operations, maintaining the characteristics of dangerous and hazardous materials, and having no subsequent original or substitute uses, such as clinical wastes of therapeutic activities, and wastes resulting from the manufacture of any pharmaceuticals, drugs, organic solvents, inks, pigments, and paints.

Article 29 of Law No.4 guides the inclusion of new entries into the lists of hazardous wastes, providing that:

The Ministers (within their respective scope), and in coordination with the Minister of Health and the Environmental Affairs Agency, shall issue a table of the dangerous materials and wastes referred to in (the glossary) of the present article.

WEEE are listed in the lists of the respective industry sector and legalized by a ministerial decree since 2002 (see Annex 3a and 3b). Interpretation of this list and associated decree needs more refinement, promotion and enforcement among WEEE generators or traders.

2.1.2 The Role of EEAA

The Egyptian Environmental Affairs Agency (EEAA) is a coordinating & regulatory body mandated to set (in cooperation and coordination with the all the development sectors and other involved stockholders in the country) the environmental policies and national environmental action plan. It also has the mandates to prepare draft environmental regulations based on strong rational from the development sectors. In addition it mandated with inspection roles which cover any violations to the environment law including improper management of WEEE.

2.1.3 Decree restricting age of imports

Regarding import of old equipment, there is only one regulation controlling the import of certain EEE set by a decree by the Ministry of Trade and Industry (MTI)[11]. The decree

[11] Decree 703 of year 2007 of the Ministry of Trade and Industry amending parts of the Executive Regulations of the Law of Import and Export and the operational procedures for inspection of goods.

provides that imported computers and peripheral devices can be up to five years old relative to the date of production.

2.1.4 Law Prohibiting Import of Used Telecommunication Devices

The Telecommunications Regulation Law No.10 of 2003 provides in Article 46 that it is "*It is prohibited to import used Telecommunication Terminal Equipment for the purpose of trading*"[12]. The definition of the telecommunication equipment here is telecommunication equipment used by a user to connect with a public or private telecommunication network.

2.1.5 Imports of (W) EEE

Regarding *Waste* Electrical and Electronic Equipment, there is the ministerial decree 165 of year 2002[13] of ministry of industry prohibiting importing WEEE, annex 3a and b provides information about the decree. Also, there are restrictions in the specific cases of used mobile handsets or computers older than 5 years as explained in the previous section.
Furthermore, stakeholders interviewed have not reported any suspicion of illegal imports of WEEE.

2.2 Local Production and Consumption of EEE

Information is rather limited on the consumption electrical and electronic equipment in Egypt due to the lack of an effective unified monitoring mechanism for the flows of consumer goods in Egypt. However, one flagship study was conducted for the ICT and electronics sector by the Industrial Modernization Center (IMC) in 2009[14], revealing the following:

- **Electronics Sector Overview:** Egypt's consumer electronics devices market, defined as the addressable market for computing devices, mobile handsets and video audio and gaming products, is projected to grow at a rate of 13% to US$4.6bn by 2013, driven by growing affordability of key digital lifestyle products and more credit availability.
- **Computers:** Computer hardware accounted for around 27% of Egypt's consumer electronics spending in 2008. BMI projects Egypt's domestic market computer sales (including notebooks and accessories) of US$757mn in 2009, boosted by government procurement programmes. Computer hardware growth rate for the 2009-2013 periods was forecast at about 13%.
- **Audio Video (AV):** AV devices accounted for around 10% of Egyptian consumer electronics spending in 2008. Egypt's domestic AV device market was projected at US$286mn in 2009. The market is expected to grow at a growth rate of 11% between 2009-2013, to a value of US$429mn in 2013.
- **Mobile Handsets**: sales accounted for around 63% of Egyptian consumer electronics spending in 2008. Egyptian market handset sales are expected to grow at an annual growth rate of 13% to US$3.0bn in 2013, as mobile subscriber penetration reaches 120%.

[12] Telecommunications Regulation Law No.10 of 2003. Available from: http://www.tra.gov.eg/uploads/law/law_en.pdf
[13] Decree 165 of year 2002, http://www.ida.gov.eg/PDF/11.pdf
[14] IMC (2007). *Electronics, Computers and Telecommunications Sector Development Strategy: Final Report*. By Hands-on Management Consulting, submitted to the Industrial Modernization Center (IMC), Egypt,

- The study adds that the market is expected to be dominated by low-spending prepaid subscribers, but the recent lifting of the ban on GPS applications should boost demand for high-end and 3G handsets.

2.3 Collection of WEEE

Collection of WEEE is done through various channels, and almost entirely through the informal sector.

- E-waste brought and bought by street peddlers (Robabekia) who roam the streets in carts calling for old household items and buying them at cheap prices.
- E-waste bought by bidders (often big waste dealers) in lots or in tons on occasions when private or public organizations offer their WEEE for sale in a formal bidding process and is often functioning equipment that is obsolete for the organization.
- E-waste sorted out by scavengers from formal and informal dumpsites.
- E-waste from maintenance and repair workshops.

2.4 Refurbishment of WEEE

The refurbishment industry is dominated by small workshops which are easily found by street peddlers and any other persons interested in selling obsolete equipment. There has been no study estimating the size of the refurbishment industry however. The small formal and informal refurbishing workshops either repair and resell equipment or dismantle them to use the spare parts to repair other equipment. Such workshops are widely diffused in Greater Cairo, especially in the lower income areas. The workshops are easily found in all other cities and rural areas in Egypt and found densely present in the hotspots of the recycling communities described in the following section.

2.5 Recycling of WEEE

Through field visits and several interviews with the informal sector (see Annex-2), the e-waste recycling practices and businesses were investigated. The markets of e-waste have grown in Egypt organically and without prior planning or government intervention to mitigate impacts. The markets are mostly in the form of dispersed workshops and informal vendors densely integrated in the urban fabric of poorer areas of Greater Cairo. The main markets are the following five, which either sell throughout the entire week, or have alternatively established one day per week to conduct most of the vending:

1. Shoubra El Khema Market, Manshiet Abdel Moniem Riad, on Sundays.
2. El Warrak Market on El Basrawy Street in Imbaba district on Mondays.
3. El Kollaly Market, throughout the week.
4. El Imam El Shafies Public Market, throughout the week, but most known for its peak activity on Fridays.
5. El-Matareya Market, Thursdays.

Otherwise, there informal e-waste handling activities can be also found sparsely distributed throughout the city, and the cities of other governorates of Egypt and to a lesser extent, rural areas. The typical activities and transactions in such markets are as follows:

- Peddlers and scavengers sell their products to workshops and shops that sell used material.

- Waste dealers who acquire large quantities in bids, classify the waste they have bought into different categories (e.g. computers, printers, copiers, etc), and sell it by piece. They either sell it to small workshops or waste recyclers.
- Waste recyclers often dismantle e-waste to sell each material independently (e.g. metal, plastic, chips/boards, and others).
- Recyclers also burn integrated circuit boards and wires to extract copper, but no leaching is practiced.
- Small workshops either repair some of this old EEE, or dismantle them to be used as spare parts for repairing other equipment.
- The repaired equipments are sold to poorer segments of society who visit these markets, while the reusable spare parts are kept for further use in the future.
- The left over (pieces which cannot be used easily anymore) and other commonly used parts, such as keys and other small articles, are sold to people in the weekly markets or disposed of in the streets or in random open spaces in proximity.

Examples of typical practices of recyclers and repair workshops observed in field visits are as follows:

- A monitor is examined, if it is operable, it will be sold by piece, and if not it is sold as scrap glass.
- The mouse and key board are examined. If functioning, they are sold by piece, or otherwise sold as scrap plastics or *San'a* (a name given to mixes of e-waste material).
- The metal casing is sold by piece.
- Some of the internal parts could be made of aluminum, where they are either sold as by piece or in bulk to metal waste dealers.
- Fans are sold by piece if functioning.
- The plastic parts are either sold by piece or as waste plastics if damaged.
- Chips and boards are sold in bulk weight to specialized dealers.Some dealers have mentioned reservedly that some boards are exported to China (also EERC representatives have expressed this suspicion) but this activity was not directly observed or noted through any evidence during the field survey and interviews.
- Small dismantling workshops dismantle all the possible electric and electronic items (e.g. resistors, capacitors, transformers, and transistors). They are either kept as parts, or sold to other maintenance and repair workshops.
- The board base, which is made of fiber, is disposed of with municipal waste or in random informal dumping sites.
- In the markets there are usually a very limited number of known skilled individuals that are known to recover gold and silver from e-waste through a thermal process (melting using welding machines), and usually sell it to jewelry shops or use it to decorate house-ware. Combustible material is therefore burnt/charred in the process. Further details of the process, such as separating molten metals, is subject to further investigation.

There was no expressed concern over environmental or health problems observed during the field visits and interviews, showing lack of awareness about hazards of improper handling of e-waste. The primary interest is maintaining business and generating job opportunities. Furthermore, there were no needs or complaints expressed by the informal sector, seeming to be in a comfort zone, with little interest in changing the business-as-usual in any direction. However, the sampled interview may not be representative of the entire population of the informal sector albeit an indicator.

2.6 Mass flow System

There have not been any assessments carried out on the inventory and mass flow of (W)EEE in Egypt. Furthermore data on imports, exports, and local production are inconsistent. For example, according to UN commodities, the exports of refrigerators are more than the sum of local production reported by the MTI of Egypt and the imports reported by the UN commodities. It is therefore needed to conduct a deeper investigation on the reliable data of stocks and flows of EEE as a first step toward determining estimations of e-waste in the country.

2.7 Impacts

The impact of the current industry of e-waste observed through field visits are as follows:

- Positive socio-economic impact is realized through:
  - Generation of job opportunities and small recycling businesses.
  - Providing access to cheaper products for poorer segments of society.
- Negative socio-economic impacts observed are:
  - Deterioration of the quality of life of residents of the market areas and loss of their land value due to local nuances and the deterioration of the urban environment.
  - Child labor commonly found in these communities, which is known to adversely affect the healthy mental and physical development of children.
- Positive environmental impact is realized through:
  - Extension of product life thereby offsetting resource consumption to otherwise produce new goods.
  - Recycling material thereby offsetting consumption of virgin material and associated resource consumption.
  - Reducing or delaying e-waste quantities sent to dumpsites and landfills.
- Negative environmental impacts observed are:
  - Improper direct disposal of mixed e-waste in the streets, public spaces, or with municipal waste destined to open uncontrolled dumpsites.
  - Burning of e-waste releasing toxic gases:
    - Occuring deliberately as a treatment method causing health risks to workers (e.g. burning boards and cables).,
    - Used as a final disposal method (ashing) to clear space,
    - Occurring spontaneously (self-ignited) when mixed with municipal waste high in organic content either in informal piles in public spaces or open dumpsites.

Furthermore, there is an expected negative environmental impact as a result of reuse of equipment due to its low energy inefficiency (or low environmental performance) compared with newer technology for the same function. This trade-off has not been studied to date in Egypt in order to identify the items that should preferably no be reused or refurbished.

3 Key stakeholders

The following sections show the various key stakeholders from the public, private, and civic sectors involved in e-waste recycling and reverse supply chain management. The past, ongoing, and planned e-waste projects are presented for each stakeholder. The respective willingness to become a project partner in potential interventions is also indicated.

3.1 Government

3.1.1 Ministry of Communication and Information Technology (MCIT) and the Ministry of State for Environmental Affairs (MSEA)

The government bodies responsible to coordinate efforts for the implementation of e-waste industry interventions are the Ministry of Communication and Information Technology (MCIT) and the Ministry of State for Environmental Affairs (MSEA) and its executive arm, the Egyptian Environmental Affairs Agency (EEAA).

Recently, a government initiative aiming at the introduction of sound e-waste management principles has been adopted by the Government of Egypt in 2010. The MCIT and MSEA have signed Memorandum of Understanding (MOU) in February 2010 to launch the *Egyptian Green ICT Strategy*, aiming to reduce adverse environmental impacts of the increasing use of ICT equipment, and introducing safe disposal methods of e-waste[15]. This constitutes the present national strategy for e-waste as the major component of the Green ICT strategy, and is explained in further detail in the following section. The first activity in this respect has been the cooperation in this present needs assessment. The MCIT, the focal point for the implementation of this strategy has expressed its keenness to create partnerships for the implementation of the strategy, which is explained further in this report.

3.1.2 Ministry of Trade and Industry

Ministry of Trade and Industry hosts the Egyptian National Cleaner Production Center (ENCPC). The ENCPC aims to enhance the productivity and environmental performance of Egyptian companies and thus to create business opportunities for Egyptian Industries to contribute to their long-term competitiveness on the national and global markets. This is done mainly through promoting transfer of know-how and technology to the Egyptian industry through international cooperation projects in cooperation with agencies such as UNDP, UNIDO, WB and GIZ, among others.

There is a *Technology & Innovation Council* under the MTI that acts as an incubator for small and middle businesses and aims to improve the capacities and the technological level of the enterprises and to promote standardization of processes. The main pillars of their activities are waste valorization, resource efficiency and process optimization, innovative designs, and product development.

3.1.3 Ministry of Finance

The Ministry of finance is an important stakeholder for multiple reasons:

- The handling of assets is regulated and supervised by the Ministry of Finance, which includes auctions for obsolete EEE of public organizations held regularly. It has not however been used to date for calculations of stocks and flows of EEE.

[15] MCIT (2011). *Green ICT*, MCIT website, Sep.10, 2011. Available from: http://www.mcit.gov.eg/ProjectDetails.aspx?ProjID=141&Cat=1&SubCat=22

- Under the ministry of finance, the Egyptian Customs Authority is the source of information to monitor and inspect the flow of EEE in and out of Egypt. They have therefore received training from the Basel Convention Regional Center (BCRC) in Cairo on EEE inspection.
- The *Vehicle Scrapping Program* of the Ministry of Finance set forth an example of business models for replacing obsolete products and establishing incentive schemes. The program replaces end-of-life taxi vehicles with discounted new vehicles[16]. The program is structured as a Public Private Partnership (PPP). The parties operating the project include: the Ministry of Finance, the Ministry of Interior, three participating commercial banks, five car companies, an insurance company and an advertising company[17].

3.1.4 Nasreya Recycling and Disposal Center, Alexandria Governorate

Hazardous wastes in Alexandria had formerly been a growing environmental pressure with no system to handle it before establishing the first treatment facility in 2005, which later came to host recycling pilot projects; the Nasreya Hazardous Waste Treatment Centre.

It was established under the Hazardous Waste Management Project (HWMP) in Alexandria; a two-phase joint project between Egypt and Finland. It was initiated in 1999 and officially inaugurated in 2005. The Egyptian Environmental Affairs Agency, Governorate of Alexandria and the Ministry for Foreign Affairs of Finland are the counterparts in the initial project. It is expected to improve prospects for enforcement of the regulatory requirements specified in Law 4 of 1994 for the protection of the environment.

The Governorate of Alexandria has formed a Hazardous Waste Management Unit (HWMU) in 2000, under which the Nasreya Hazardous Waste Treatment Centre operates. Phase I of the facility includes a secure landfill and solar evaporation ponds to receive wastes, and Phase II includes mechanical and chemical treatment, solidification, and interim storage.
Organic hazardous waste is conditionally received if a pre-set destination is determined.

Later, the success of this initiative has paved the way to venture into new projects that are currently ongoing for Fluorescent light tubes recycling in cooperation with the Korean International Cooperation Agency (KOICA), and also plastic recycling in cooperation with Alexandria University. The plant has been inaugurated during the preparation of the present study, on September 19th, 2011.

Challenges and risks for feasible operation however are foreseen since there is not yet an incentive scheme in place to motivate the private, public, or civic sector to send the waste fluorescent light tubes to the recycling facility. Thus far, the private sector enterprises contacted by El-Nasria have been reluctant to offer the waste free of charge[18].

Supportive measures to mitigate these risks and expand/replicate the initiative are therefore to find and implement means to incentivize or enforce disposal of this product at the recycling

[16] MoF (2009). End-of-life Vehicle Recycling: Taxi Recycling Project, Public Auction No.10/2009 announcement. Available from: http://www.mof.gov.eg/MOFGallerySource/English/PDF/Public%20Auction%20No.%28102009%29.pdf, accessed: Sep.29, 2011.
[17] EcoConServ (2010). Framework Environmental and Social Assessment (FESA) for Egypt Vehicle Scrapping and Recycling Program. Available from: http://www.mof.gov.eg/mofgallerysource/Arabic/PDF/The_full_study.pdf, accessed: Sep.15, 2011.
[18] Deif Suleiman, Manager of El-Nasria Lanfill. Phone interview, September 11, 2011.

facility. This is currently being planned in cooperation with the Korean International Cooperation Agency (KOICA) in Egypt.

3.2 Private Sector Enterprises

3.2.1 Egyptian Electronics Recycling Company (EERC)

The Egyptian Electronics Recycling Company (EERC) EERC was established in 2010 as an environmentally friendly business for recycling of e-waste. EERC is operated in cooperation with informal dealers of E-waste and both public and private organizations.

Their current business is refurbishment and dismantling of e-waste, with future plans for material recycling. The past and ongoing and planned activities are as follows:

1. **Egyptian Association for Green Environment (2010):** A short pilot project to refurbish PCs and Laptops and it involved a study on e-waste in Egypt (private market research study). The Association was established under a Danish Business-to-Business cooperation programme. The cooperation was between the Egyptian computers trading company *CompuMe Egypt* and the European PC refurbishing company *Tier1 Asset*.
2. **Refurbishment and Dismantling (2011):** A facility for refurbishing and dismantling electronic devices (mainly PC components, CRTs, and printers) was established on a rental area. The dismantled items are exported to recycling facilities in Denmark. The remaining items are sold in the local market. The throughput of the recycling facility in practice was 10-12ton/month of received e-waste sourced from public and private organizations through bids. Approximate shares of each category were 60% PCs, 30% CRTs, and 10% printers of the main bulk, in addition to minor quantities of other devices and peripherals. Refurbishment is however minimal since received objects are most often irreparable.
3. **Planned E-waste recycling and material recovery (under development):** EERC is currently setting up a company with a total area of 4,507 m^2 in 6th of October industrial city near the capital to develop a plant for recycling and refining of e-waste material. It is planned to be commissioned in January 2012 with a capacity of 20-30 tons/month of mother boards and other printed circuits.

The needs of EERC are as follows:

1. To enforce accreditation requirements for collectors of e-waste through relevant governmental authorities and to thereby create a level playing field.
2. To raise awareness among stakeholders about the importance of collection of e-waste and to establish a collection system.
3. To limit the export of WEEE and provide proper training for inspectors at the customs authority to identify it. The motive behind this suggestion is to ensure that enough WEEE originating in Egypt remains held back in order to allow local recycling projects to be feasible and not lose its “raw material” (or risk losing it in the future) to the export market.

3.2.2 Spearink

Spear Ink, founded in 2006, is an Egyptian company that refills and re-manufactures inkjet cartridges and toners and sells them. It thereby extends the lifecycle of the end-of-life items. Their refilling machines are a product of their in-house R&D department[19]. The company

[19] Spear ink Website: http://www.spearink.com/

therefore also offers a complete line of tools and supplies for the refilling process. The success and size of the market led the company today to open multiple branches in the Middle East (franchises) as well. In an effort to raise awareness they have also launched a website (*www.greenegypt.com*) as an effort to educate consumers about recycling of e-waste. The take-back policy leads to recovering 3000-4000 cartridges annually20. Approximately 4 tons of products per year are processed. Waste material is sent to landfills, but the possibility to sell them for industrial uses is under study.

3.2.3 Mobinil – Mobile Operator

Mobinil was established in 1998 and is currently the largest mobile operator in the Middle East and North Africa. Mobinil owns Link Dot Net, one of the leading Internet Service Providers in Egypt offering voice communication, broadband data and Wi-Fi services to its 30 million subscribers. Mobinil is the first operator in the region to obtain ISO 14001 certification, it boasts a versatile social responsibility program since inception. The company's workforce is 5100 permanent and contractual employees.

The company has been conducting limited but effective recycling actions since 2005, through implementing mobile handsets and mobile batteries collection and recycling schemes under the UN Basel Convention and in cooperation with the Ministry of Environment. Mobinil has also implemented an IT equipment refurbishment project, by sorting and refurbishing Mobinil's waste IT equipment (servers, screens, and laptops) for donation to public schools and charities.

Other initiatives aim at raising public awareness on hazardous waste and its potential risks on the environment through partnering with local NGOs such as CID Consulting and the Spirit of Youth NGO in establishing an E-waste Learning Center to teach eligible youth e-waste sorting and dismantling techniques.

The ongoing projects and plans are as follows[21,22,23]:

1. **Office Waste Recycling (since 2002)**: A project for collection and recycling of toners, drums and cartridges from copiers and printers. The project is implemented in collaboration with Hewlett Packard, Cannon, and Xerox company. Activities also include collection of shredded paper and cardboard. By 2006, the project had collected more than 1800 units of toners, drums, and cartridges.
2. **Waste Mobile Battery Collection and Recycling (2005-2006):** A mobile battery collection and recycling scheme under UN Basel convention aiming to reduce impact of hazardous waste from mobile handsets and batteries. The project was in partnership with EEAA, FoneBak, and the UN Basel Convention. 25,000 units, weighing average of 1.5 metric tons were collected.

[20] Spear ink e-waste questionnaire survey, Sep.10, 2011.
[21] Mobinil Health Safety and Environment Newsletter, 2011. Available from: http://xa.yimg.com/kq/groups/22066697/702002633/name/E-waste_Recycling_School.pdf, accessed Sep.1,2011.
[22] Mobinil e-waste Profile, 2010. Available from: http://xa.yimg.com/kq/groups/22066697/1451485926/name/MN_Ewaste_Profile_V2.0.pdf, accessed Sep.1,2011.
[23] CEDARE Questionnaire Survey Form for Mobinil, Sep.2011.

3. **"Bridging the Digital Divide" PC refurbishing program (since 2008):** A project aiming to refurbish obsolete computers and offer them to charity (a total of 70 PCs).
4. **Alexandria Dry Cell Collection and Safe Dumping (since 2008):** Mobile batteries and dry cells collection and safe disposal aiming to reduce the impact of hazardous waste and raise awareness among youth. This project was in partnership with the governorate of Alexandria, EEAA, and a local NGO.
5. **E-waste Learning Center (2009):** An e-waste learning center aiming to establish a skills development center to teach eligible youth the techniques of e-waste sorting, dismantling, and refurbishment in partnership with CID Consultants and the Spirit of Youth NGO. It resulted in creating 50 job opportunities. All hazardous components were stored safely. They are to be safely dumped in El-Nasserya hazardous waste disposal site in Alexandria.

6. **Participation in Mobile Phone Partnership Initiative (MPPI):** Planning an end-of-life mobile collection and recycling scheme aiming to raise awareness internally among employees about the importance of recycling mobile phones, under the UN Basel Convention. It is considered a second phase of the mobile batteries initiative. This is part of an internal project of FT Orange Group called the 'Phoenix' project. In this context, Mobinil, in line with the *Phoenix* project, already has more than 2,200 handsets in storage. The handsets had been collected from customers (and replaced by new ones) during repair operations. This activity remains ongoing.

Regarding the Phoenix project set up by Orange, this project was created to support the countries with the definition and implementation of actions that would increase significantly the collection of used phones. This includes trade-in propositions (buy-back for cash, voucher, bill reduction, etc) that can impact significantly their core business and commercial offers, and also Eco-citizen propositions ("good deed" with no financial incentive, but with dedicated communication campaign). In this context, countries are asked to setup a transversal team (Marketing, Sales, After Sales, Reverse Supply Chain, Devices, CSR, Communication…), and define a roadmap with the appropriate budget to achieve their target, with first a 10% minimum collection rate by 2011[24].

Another project that Mobinil is participating in that supports extending the life of computers is the project *Revive* that is conducted in partnership with Microsoft, CID consulting, Spirit of Youth NGO, and other partners[25]. The prospects for this project is to establish a large network for the collection of PCs and mobile phones, train and employ youth for refurbishment and recycling, and provide and train them on essential software programs for computer literacy. Refurbished items are then distributed, and recipients are encouraged to return them to the same center when obsolete. The project is currently seeking further partnerships to widen the network of donors and beneficiaries.

3.2.4 Vodafone Egypt – Mobile operator

Vodafone is implementing various initiatives as part of its CSR program, such as an in-store mobile handset and battery collection initiative, against an incentive recharge card (valued at

[24] Orange FT presentation, *Mobile Phone Collect, Reuse and Recycle – Orange Quest 2015:The Phoenix Project.*
[25] Mobinil (2011). Project Revive. Health Safety and Environment department flier, Mobinil, Jan.23, 2011..

€1 per re-usable piece for recycling). Vodafone also donates phased-out PCs to local NGOs for re-use or refurbishment.

3.2.5 NOKIA

Nokia is a world leading manufacturer of mobile phones with wide presence in Egypt. The company takes sustainability into account along the entire life cycle of products, services and operations. Minimizing the environmental impact includes raw material selection and acquisition, product design for environment, supply chain, transportation, logistics, manufacturing, actual use phase, and finally recovery and recycling. This means that Nokia's approach is to consider recycling already before devices are made.

Nokia is among the leaders in the industry in substance management removing many substances of concern: Since 2006, Nokia's new devices, chargers and headsets have been free of PVC and since 2009 Nokia has been phasing out BFR and RFR (brominated and chlorinated compounds and antimony trioxide) from the products. The products are free of mercury, lead and many other substances of concern since various years26. Nokia creates material innovations by using biopaints, bioplastics and recycled metals in the so-called *eco lead devices*. In addition, the possibility to download software updates supports extending the life of the product27.

In 2009, Nokia collected 4.6 million phones globally. However, in regions where the concept of recycling is still very new, in addition to Nokia take back and recycling scheme, Nokia focuses environmental awareness raising campaigns to support the creation of recycling societies and cultures.

In the Middle East and Africa, Nokia's take back and recycling engagement started in 2009 with the first launches of the permanent take back and recycling schemes at Nokia Care points. Currently in 2011, permanent recycling channels are available in more than ten countries in the Arab region28.

In addition, educational campaigns, awareness raising campaigns or recycling activation have been conducted in United Arab Emirates, Lebanon, Egypt and Pakistan.

Past activities specifically in Egypt are as follows:

- **Nokia Care's Take Back & Recycling Scheme:** In Egypt, Nokia launched the take back and recycling scheme at Nokia Care in 2009. The Nokia collection points are permanent and accessible across Egypt. A permanent recycling internet page shows all recycling locations[28]. Nokia supplies the collected material from campaigns to a Nokia approved network of recycling service providers. They recover and recycle the material applying international standards. Material regained can be used to produce new things. Nokia audits and approves the recycling service providers on a regular basis to assure they fulfill the Nokia requirements for responsible and environmentally efficient recycling.

[26] See www.nokia.com/substances for further information on substance management and Nokia Substance List

[27] See http://www.nokia.com/environment/devices-and-services/devices-and-accessories/eco-profile to download environmental information for Nokia devices.

[28] See www.nokia.com/recycle for the Nokia Recycling locations search page.

- **Mobile Phone Recycling and Social Development with Resala NGO:** In summer 2011, Nokia partnered with Resala NGO to improve community development efforts in Egypt while providing an easily accessible solution for recycling of mobile phones, batteries, chargers and other mobile accessories. Collaboration was linked to fund the Resala TAWASOUL projects to support underprivileged people in Egypt. During 2 months, Nokia and Resala used advertising, social media and selected media partners to activate consumers in Egypt to start becoming aware of the importance of recycling and contribute to Resala by active recycling. With this approach and pilot, Nokia aimed to gain country specific understanding of how to bring the concept of recycling closer to the people. Recycled quantities resulting from the pilot campaign have been small, and indicate more need for education and awareness rising on environmental issues in the future.

For the Middle East, and with great attention to the large market of Egypt, Nokia is keen to support the creation of a sustainable recycling society. Such schemes are suggested to consist of the following cornerstones to which it may contribute:

a. Collection network and infrastructure
b. Recycling industry
c. Supporting activities such as awareness raising, monitoring and reporting

They further stress on the need to ensure restricting recycling only to recyclers that are approved by international standards and in Nokia Supplier requirements.

Recycling of mobile phones has drawn attention since devices host high recycling material value despite their small size. This has been identified as an opportunity to integrate socio-economic development projects in planned recycling schemes for Egypt.

3.2.6 Oracle

Oracle-Egypt Company, headquartered in Smart Village in Egypt, is part of Oracle Corporation the international software company. The company has been engaged in responsible recycling activity, but rather driven by data-security concerns. Currently, the annual disposal of notebooks ranges between 100-200 units.

Oracle resorted to the Egyptian Electronic Recycling Company (EERC) to ensure responsible recycling of their outdated computers. This was part of EERC's pilot project under a Danish Business-to-Business cooperation programme (see section 3.2.1). Revenues from sold refurbished computers were given to charity.

3.2.7 Olympic Group

Olympic Group is among the first Egyptian Manufacturers to produce household goods in the 1920's and is today among the largest in Egypt. The main products manufactured by Olympic Group are automatic washing machines, refrigerators, electric water heaters and gas cookers. Other products include fans, oil-filled radiators, exhaust fans, manual washing machines and coolers[29]. It has a large network of dealers and distributors in Cairo and other governorates in Egypt. One of the group's trading arms, the wholesale trader EPA, is the largest white goods trader in Egypt and alone has 12 branches and a large network of 1600 dealers and

[29] Olympic Group Website, *Profile*, Available from: http://www.olympicgroup.com/innerpages/history.aspx accessed: September 5, 2011.

distributors and is supported by a large network of after-sales services centers[29]. Olympic Group today also exports international brands such as such as Electrolux, AEG, Frigidaire, and it produces and distributes Zanussi.

Despite the size and extent of vertical integration of the group and its services, and despite its compliance with international standards in quality, there have not yet been any plans to implement Extended Producer's Responsibility policies such as take-back systems[30]. There is however willingness to look into the feasibility of such projects for implementation.

3.2.8 Toshiba El-Araby

Toshiba El-Araby is one of Egypt's leading manufacturers and agents of engineering products, most known for being the only Arab commercial agent for Toshiba products in Egypt. The activity of interest to this study in which Toshiba El-Araby is involved is the recycling practice in their Fluorescent Light Tubes manufacturing plant in Mubarak Industrial City. The plant manufactures 27 million light tubes per year of which 80% are destined to the local market and the rest exported. The relevant activities are as follows[31]:

1. **In-house recycling facility:** According to interviews, the plant hosts a recycling facility consisting of an underwater crusher that recovers mercury and can save about half of the annual demands for mercury[31]. When the crusher is out of operation or not of sufficient capacity, the fluorescent lamp tubes are to be sent to the Nasreya recycling facility in Alexandria.

2. **Contemplated take-back scheme:** A potential take-back scheme project has been discussed internally in the company. The suggestion discussed was that Toshiba, through its distributers, can offer discounts for retailers in exchange for recovered light bulbs upon delivery. This is seen as the best fit scheme for the conditions of the private sector in Egypt. Retailers will in turn be incentivized to establish their own collection schemes as they see fit to their local conditions.

The needs of the plant to assist it in adopting EPR practices is to raise awareness of consumers and retailers about the importance of recycling in order to facilitate future schemes for collection. There is also interest to identify cheaper technologies or suppliers of recycling facilities to improve the feasibility of recycling for them.

3.2.9 CID Consulting

CID Consulting was established in 1995 with the mission of community development. It has conducted numerous studies on the socio-economic status of the informal sector and vulnerable groups. The accumulated experience in providing solutions and testing new and effective mechanisms, mostly in the field of SWM, has led it to receive several awards, the most recent being the 2006 "Social Entrepreneur of the Year" awarded at the World Economic Forum by the Schwab Foundation.

[30] Eng. Hassan Ibrahim, Electrical Equipment Plant Quality Manager, Olympic Group. Personal Interview, September 12, 2011.
[31] Eng. Ahmed Zaghloul, General Manager of Toshiba El-Araby Light Tubes Factory in Mubarak Industrial City, Quesna. Personal Interview, September 12, 2011.

CID Consulting worked on promoting and supporting community-based recycling schemes and communities in the informal and semi-formal sectors and contributing to national waste management strategies in Egypt, the Middle East and Africa.

The extensive consultancy services and experience of CID in the field of e-waste management systems and community development is highly recognized in the field, especially in the establishment of the E-waste Recycling Project (including the aforementioned e-waste learning center) since 2009, aiming to:

1- Recover and recycle e-waste collected and transported
2- Create and sustain jobs, revolved around e-waste recycling
3- Generate income for poor youth and their families in El-Mokattam area.
4- Continue to offer a non-formal education opportunity for those who had to work to sustain their poor families.
5- Reduce the negative impact of dumping e-waste items by promoting, in a practical way, recovery and recycling approaches & techniques.
6- Strengthen the relationship between the private sector and civil society through implementation of successful programs for a better environment and community development.

Further promotion of CIDs activities can be achieved through providing further support to their existing initiatives and supporting further expansion and replication of their projects, and by resorting to their expertise in similar initiatives elsewhere to ensure a constructive know-how development process for the sector.

CID can also play a role as an incubator and a focal point of numerous NGOs over Egypt, through their rich database. It has in fact provided incubator functions for the aforementioned SOY and Mobinil project that they had also designed.

3.3 Non Governmental Organizations (NGOs)

3.3.1 Resala

Resala NGO, established in 2000, is one of Egypt's largest NGOs working on diverse charitable activities, with wide presence across Egypt through its 50 branches. One of its activities is collection of EEE donations from the public and private sector and civil community. The EEE collection program covers Greater Cairo and Alexandria. An example of the types and quantities of old equipment is provided in Annex-1.

The NGO however only collects for the purpose of selling these donations to several dealers as a fundraising activity for their organization. As any NGO, the fundraising activity is conducted under supervision of the Ministry of Social Solidarity, and only targets the local market. Usually 100% of collected items are functioning and sold, unless certain items are needed in the NGO offices.

According to their observed trends, the business of collection is growing. In 2010, the revenues were 5.7 MLE (957,000 USD) of revenues over the past entire year (see Annex-1), but the same number was achieved and surpassed only over the past three months of June-August 2012 at the time of the interview, i.e. the monthly revenues have quadrupled.

Resala has chosen not to expand downstream the recycling process, such as refurbishment, or dismantling and material recovery. They have the institutional capacity and the land, but maintain that there is a lack of skilled labor for these activities. According to interviews, the necessary training programs would not be part of the NGO's core interests in charitable activities[32].

They are however open to feasible ideas to further promote the sector if a large and feasible social return is foreseen. Resala therefore expresses interest in learning about successful business models for recycling of e-waste and to know more about the criteria for feasibility in the local conditions of Egypt. Furthermore, they stress that any project must be clearly justifiable for the Ministry of Social Solidarity in order to obtain their approval for such projects.

3.3.2 Spirit of Youth Association from Environmental Services

The Spirit of Youth Association for Environmental Services was registered in Cairo on 6/7/2004 as a developmental NGO in the field of environment, health and development in various fields in the Cairo governorate, and mainly in the garbage collectors area. All members of the NGO originate from families of garbage collectors who have taken the initiative to improve and develop their inherited trade.

In partnership with CID Consulting and Mobinil, the Association has initiated an E-waste pilot project in Manshiet Nasser, informal area. The objectives of the pilot project are as enlisted in section 3.2.9 describing the role of CID as the project designer and supervisor.

Activities included monitoring the methodology execution in identifying jobless youth, training them to dismantle and refurbish ICT waste and store hazardous parts for safe recycling. They are also involved in spreading awareness among the private sector about Extended Producer Responsibility (EPR) in cooperation with the Egyptian Environmental Affairs Agency (EEAA). The project is currently ongoing and aspiring to expand with the help of more private sector organizations.

3.4 International Organizations

3.4.1 CEDARE

The Center for Environment and Development in the Arab Region and Europe (CEDARE) is an international non-profit organization of diplomatic status established in 1992 to promote environmental development in the Arab Region. CEDARE has been actively promoting the development of the e-waste collection and recycling sector in the Arab Region since 2009 and has been taking a leading role in promoting dialogue between stakeholders. Activities thus far were as follows:

Knowledge Sharing and transfer

- CEDARE is the regional focal point for the Middle East and North Africa (MENA) for the *Solving the E-waste Problem* (StEP) Initiative[33].
- Created the E-waste Management Forum, and held the following annual events:
    - E-waste forum 2009: 9-10 February 2009, Cairo, Egypt.

[32] Tarek Awwaad, Warehouse Manager, Resala NGO, personal interview, September 6, 2011.
[33] StEP website (2011), *Regional Focal Points*, StEP website. Available from: http://www.step-initiative.org/actors/regional_focal_points.php accessed: Sep.29, 2011.

- E-waste forum 2010: 23-24 November 2010, Marrakech, Morocco.

E-waste Assessment

- Conducted a study on E-waste Management Practices in the Arab Region in partnership with UNEP (2008 –2010).
- Conducting the current study implemented in cooperation with EMPA and seeking potential partnerships for interventions in Egypt.

Capacity Building

- Established an e-learning introductory course on E-waste Management (elearningserver.cedare.int)
- Established an e-learning course on how to create a collection and dismantling centre.
- Provides technical assistance to governmental organizations and ICT private sector enterprises.

3.4.2 Cairo Basel Convention Regional Coordination Center for Arab States (BCRC)

BCRC is one of 14 Basel Convention Regional Centers, operational since 1998 and officially approved by the conference of parties of the Basel Convention in 2004. It is hosted in Cairo University and serves 22 Arab countries in the Region. CBCRC has been concerned with the e-waste challenges since 2005 and was involved in channeling funds from the Finnish government to carry out e-waste training sessions in 2007, and continues to conduct many activities for awareness raising in the region[34]. Key activities are enlisted as follows:

MPPI Guidelines for the Arab Region:

With a contribution from the Swiss government, CBCRC translated and published the Mobile Phone Partnership Initiative (MPPI) guidelines on used and end-of-life mobile phones.

E-waste Assessment in the Arab Region:

In 2008 CBCRC signed an agreement with the UNEP Mediterranean Action Programme (UNEP/MAP) to carry out e-waste assessment in the Arab Mediterranean countries including the Palestinian authority territories. CBCRC is also participating in the ongoing Partnership on Computing Equipment (PACE) initiative.

E-waste Africa Project –Enforcement Component:

The e-waste Africa project (2008-2012) is a comprehensive programme of activities aiming at enhancing environmental governance of e-wastes and catalyzing partnerships and small businesses in the recycling sector in Africa. It is being implemented in the framework of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. BCRC Egypt is participating in the Enforcement component of the E-waste Africa project.

The project is implemented by the Basel Convention Coordinating Centre for Africa based in Nigeria and the Cairo Basel Convention Regional Centre for Arab states based in Cairo and Basel Convention regional for French speaking African states based in Senegal in cooperation with partners: the Swiss Federal Laboratories for Materials Science and Technology (EMPA), the Institute for Applied Ecology (the

[34] BCRC-Cairo (2009). Egypt & E-waste Activities in the Arab Region, E-waste forum presentation, 9-10/2/2009. Available from: http://ewasteforum.cedare.int/Presentations/Session_V/BCRC.pdf

Öko Institute), the European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL), the United Nations Educational, Scientific and Cultural Organization (UNESCO), and the Partnership for Action on Computing Equipment (PACE)[35].

The target countries in the E-waste Africa project are Benin, Côte d'Ivoire, Ghana, Liberia, and Nigeria. Egypt however is a participant in only the fourth component concerning enforcement. The first three components consist of assessments and studies on end-of-life e-products and investigating potential international cooperation between African SMEs and European recycling companies.

As participant in the Enforcement component, the activities conducting by CBCRC-Egypt has been delivering training to the customs authority and regulatory bodies on e-waste inspection[36].

Other awareness-raising activities:

BCRC co-organized POPs workshop in 2005 sponsored by Government of Switzerland through the secretariat of the Basel Convention with additional funding from the Government of Canada through UNEP Chemicals and the World Health Organization (WHO)[37].

The recommendations of BCRC for Egypt and the region are to assist competent authorities to develop proper legislation for the management of e-waste, to support the informal sector in creating partnerships and to grow with improved environmental performance, and to support e-waste collection and CSR programs in the private sector, and raise awareness[34].

[35] E-wasteguide.info (2009). *Basel Convention e-Waste Africa*. September 10, 2011, http://ewasteguide.info/node/4436

[36] BCRC (2009). *E-waste Africa Project*, Basel Convention Secretariat. Presentation, Accra, Ghana 24-25 June 2009.

[37] BCRC-Cairo 2005). Workshop Report –Regional workshop for Arab states on the environmentally sound destruction of POP and decontamination of POP containing waste in the context of the Basel Convention and the Stockholm Convention, Jordan, 28-31 August, 2005. Available from: http://basel.int/centers/proj_activ/tctf_projects/022.pdf

4 Current Green ICT Strategy

This section provides a description of the current situation and trends in policy & legislation impacting the electronic waste situation as driven by the government and industry.

4.1 MCIT & EEAA Protocol for Cooperation (2010-2012)

A protocol for cooperation between the MCIT and EEAA to implement the Green ICT Strategy in Egypt was signed in February 2010 for two years subject to renewal. The MCIT has earmarked approximately two million Egyptian Pounds (335 kUSD) for the protocol[38]. The protocol consists of three programs:

- Awareness raising program: Several activities for awareness raising and capacity building among stakeholders, in addition to establishing conditions and specifications for identifying environmentally friendly ICT equipment.

- E-waste management program: E-waste assessment and database for Greater Cairo, supportive awareness raising activities, fostering partnerships among stakeholders to implement pilot projects, and assisting in amending the legislative framework to serve the program.

- ICT Solutions for a Sustainable Future: Awareness raising and implementation of pilot projects, and, as mentioned in the MoU "supporting the MSEA in establishing a database to collect data related to climate change and analyzing it statistically".

A stakeholders committee was established to oversee this protocol, consisting of assigned members of the MSEA and the MCIT.

The priorities at MCIT for Green ICT, encompassing e-waste, are currently to conduct an e-waste assessment and baseline study, develop a climate change database in support of green ICT, and to raise awareness about Green ICT among stakeholders[39].

4.2 Green ICT Strategy

The Green ICT Strategy aims to raise awareness about Green ICT, improving e-waste management and implementing sustainable ICT solutions. The objectives are stated as follows[40]:

1. Raising community awareness about Green ICT challenges and opportunities,
2. Setting fundamentals and national policies for Green ICT,
3. Adopt a multi-stakeholder approach to address various green ICT challenges,
4. Reduce the adverse environmental effects resulting from the expansion in the use of ICT,

[38] MCIT/EEAA Protocol (2010). Green ICT Strategy Protocol, Feb. 2010. Available from: http://www.mcit.gov.eg/Upcont/Documents/final%20protocol201034123416.doc, accessed: Sep.12, 2011.
[39] EMPA Mission Report Egypt, 04-07 April 2011.
[40] MCIT (2010). *Green ICT Strategy*. Sep. 5, 2011. Available from: http://www.itu.int/dms_pub/itu-t/oth/06/0F/T060F0060150001PDFE.pdf

5. Supporting the use of communication and information technology as an effective tool to reduce GHG emissions resulting from other sectors.

This is planned to be achieved through the following framework programs:

1. Raising Community awareness about Green ICT Program.
2. E-waste sustainable Management Program.
3. ICT Solutions for a Sustainable Future program.

1. **Raise Community awareness about Green ICT Program**
    a. Establish a Green ICT Community of Expertise (CoE).
    b. Organizing workshops and sessions to raise community awareness about green ICT.
    c. Develop a training program for building capacities in the field of green ICT.
    d. Compile leaflets and publications to raise community awareness about green ICT.
    e. Compile manuals to raise the awareness of public and private sector about Green ICT.
    f. Establish conditions and specification for Green ICT equipment.
2. **E-waste sustainable Management Program**
    a. Conduct an e-waste assessment report that covers the Greater Cairo governorate.
    b. Implement a program for raising the community awareness about e-waste threats and opportunities.
    c. Support the participation of IT companies and institutions to start the implementation of pilot projects for e-Waste Management
    d. Participate in proposing legislation and laws to support the rational management of e-waste.
3. **ICT solutions For a sustainable future program.**
    a. Organizing workshops and sessions to raise community awareness about the role of ICT in dealing with the repercussions of climate change.
    b. Establish a pilot project for applying green and smart ICT applications in one building of new technological areas inMaadi, and Compile study to determine the compatibility of the smart village with the standards and architecture of green buildings.
    c. Support the Ministry of State for Environment Affairs (MSEA) to establish a database to collect data relevant to climate change and analyzing it statistically.

4.3 World Bank (WB) & MCIT agreement

An agreement was signed between the World Bank and the MCIT in June 2010 to assist the MCIT in playing a more active advocacy role in the greening of ICT in the context of the national development agenda[41]. This is to be done through formulating a Framework for the Egyptian Green ICT Strategy, and implementation of a pilot project on e-waste management.

The agreement included a description of the planned Phase-1 of the plan to fulfill the terms of the agreement, consisting of preparatory activities, while the foreseen Phase-2 would include formulation of the actual full-fledged strategy. Phase-1 was described as consisting of the following components:

[41] WB/MCIT Agreement (2010). WB and MCIT Agreement on Green ICT, June 2010.

- Component A: Formulating a Framework of the Egyptian Green ICT Strategy.
- Component B: Design of an e-waste pilot project. The location, the 6th of October City has been chosen as the study area to host the pilot project; it contains mixed development and also hosts the MCIT headquarters in Smart Village. Activities under this component include activities listed as follows (summarized):
    - Develop TORs for an e-waste assessment and baseline study,
    - Develop TORs for an assessment of potential opportunities to establish an E-waste recycling industry.
    - Design incentive schemes to support the sector and engage stakeholders.
    - Prepare TORs and agreement models for collection and recycling in the pilot zone.
    - Develop guidelines for the private sector and NGOs involved in the project implementation.
- Component C: Design of Awareness, Information Dissemination and Knowledge development campaign on e-waste management. The WB will provide advisory services while implementation will be carried out by MCIT. The WB will collaborate with the Regional Solid Waste Exchange of Information and Expertise Network, "SWEEP-Net" for the design and implementation of this component.

On the days of the 1st- 4th of November 2010, the World Bank first consultation has been organized and included workshops and meetings with the stake-holders of the Egyptian Green ICT Strategy. In December 2010, the first draft of the "TORs of the diagnostic analysis and potentials for establishing an E-waste recycling industry in Egypt" has been drafted.

MCIT also maintains a highly active involvement in international developments in the field of Green ICT. It has also taken initiative in awareness raising activity by developing *Egypt's Green ICT portal*, which is currently under construction in communication with the World Bank and other business partners to share the relevant material.

5 Conclusions

The conclusion of the assessment is presented in this section in the form of a SWOT Analysis of the overall situation to conclude with the identification of areas where intervention is needed and feasible and will indicate the topics needing further research.

5.1 Strengths

- Egypt's specific obligations to the chemicals & waste related multilateral environmental agreements.

- There is a national Green ICT Strategy in place involving consideration of e-waste handling and targeting a large fraction of EEE products relevant to the ICT sector.
- Funding: There are funds allocated for the Green ICT Strategy implementation. The fund is provided by the ICT Trust Fund and the Ministry of ICT, administered by the UNDP Egypt office and originally financed by multilateral organizations.
- There are legal measures in place to restrict import of e-waste (the import restrictions on EEE older than 5 years and the ban on imports of used mobile phone handsets, and the total ban on e-waste).
- The e-waste sector stakeholders in Egypt are well networked and the businesses in the field are vibrant and growing for all parties, the private sector, NGOs, and the informal sector.
- Stakeholders are already aware of the opportunities in the e-waste business, including collection, refurbishing, dismantling, simple recycling, and export for recycling abroad, which are all already practiced widely.
- The private sector recognizes e-waste management as a field of Corporate Social Responsibility as well as other business-supporting opportunities.
- There are already models for take-back systems and in house recycling that can be expanded and replicated.
- There is already a hazardous waste reception and recycling facility in place in Alexandria; a fluorescent-lamp recycling facility in test operation and the area can accommodate more pilots.
- There is a large market (diverse industries) for different recycled material.
- Some hazardous practices used in other developing nations for recycling are not practiced in Egypt (such as leaching).

5.2 Weaknesses

- Waste management remains a challenge for Egypt. All waste streams are targeted under the "Strategic framework for the Environmentally Sound Management of Waste" adopted by the cabinet in 2002. It was focusing in the solid part of the waste (whether its nature is hazardous or non hazardous). Therefore all objectives and guiding principles and policy approaches for the solid waste management could be used to develop a particular policy framework for WEEE.

- The Green ICT strategy does not demand the creation of policies to govern the greening of ICTs and has a limited scope not covering all WEEE. It also does not require companies to safely dispose of ICT e-waste, which has allowed scrap-dealers to control the market.
- Enforcement mechanisms and inspection capabilities are scarce and often costly.
- There is limited local expertise in implementing WEEE projects, and limited local research in the field (if any) or assessments.
- There is a common lack of awareness in the Egyptian society about the risk on the public health and the environmental that might result from improper management of WEEE. The stakeholders, especially the informal sector, are not sufficiently aware of about the best environmental practices.
- There is little awareness of the adverse impact of the life-extension of certain products refurbished on the environment compared to new products (such as energy consumption).

5.3 Opportunities

- There are many opportunities in the WEEE management sector for employment generation.
- WEEE is rapidly increasing with rapid urbanization and population growth.
- There is already several business models piloted in Egypt, either not-for-profit or for-profit, that can be replicated and expanded on as a foundation.
- In terms of funding, opportunities are limited in terms of international cooperation agencies and donor organizations, but the private sector is keen to participate in developing the sector mainly through Corporate and Social Responsibility (CSR) programs with special interest in job-creating programmes.

5.4 Threats

- Large scale take-back policies might negatively affect the downstream industry of WEEE management if the latter lose their supply.
- Establishing an accreditation system to certify environmentally sound waste dealers and recyclers will put these parties at risk of unfair competition from the informal sector.
- Enforcing environmental compliance standards on the informal sector might negatively affect their profitability and receive significant resistance.

6 Recommendations

6.1 Proposed Initiatives

The recommendations for interventions are presented here in the form of suggested Work Packages. These proposed programmes can be included in Egypt Green ICT initiative, which is currently the only initiative that has multi-stakeholders approach and has electronic waste (in particular those generated from ICT sector and not included electric waste) as a main component. Below are the proposed programmes in the form of suggested Work Packages (WP) that are needed:

WP1. E-waste Assessment Programme:

This Work Package aims to enhance the E-waste management system for Egypt is to engage private sector in providing solutions for establishing e-waste collection and recycling centers.

Currently, there is no accurate information about the quantities and types of available E-waste in Egypt and no relevant monitoring of the stocks and flows and information on transportation and handling, estimation of the numbers of recyclers, workshops, and dealers, etc, as well as assessment of the formal sector, producers and importers.

Conducting an E-waste assessment study for Egypt is therefore essential to provide relevant information that would be the basis for creating an e-waste management industry in Egypt. The study can be for Cairo governorate as a pilot phase.

The work package should include capacity building activities for local authorities and relevant stakeholders to enable them to conduct the e-waste assessments and future monitoring and evaluation. This would provide sustainability for conducting assessment for other main cities in Egypt.

WP2. E-waste Recyclers Accreditation Programme:

This Work Package aims to assist in having a fair trade mechanism in the e-waste handling industry. The below tasks are recommended:

- Developing an Egypt WEEE Directive: WEEE-related legislations are scattered among different ministries. A review of existing regulations and proposing adjustment or new legislations and consolidation into a WEEE directive is necessary.
- Developing an accreditation system for e-waste for private sector participation: There is a need to have a local accreditation system for private sector collectors and recyclers. This will allow putting restrictions on sourcing e-waste from the public and private sectors, such as through formal biddings. Strict enforcement is needed in order to ensure a level playing field.

These objectives shall be met through stakeholders' consultation and dialogue with policy makers to ensure its practicality and tangible outcome bringing about greater environmental compliance in the industry and enforcing Extended Producer Responsibility among producers in specific.

WP3. WEEE Youth Incubators Programme:

This Work Package aims to provide financial, administrative, legal, and technical support to selected youth to establish small enterprises that handle e-waste such as collection and dismantling activities. The Incubator will be for one year, ensuring that the incubated social enterprise will spinoff and continue operation sustainable, creating more green jobs opportunities.

The operation of the incubator and assistance to the youth will be provided by local (or regional) organizations experienced in incubation of social ventures. It must ensure building on the successful experience of the e-waste recycling school implemented by CID and Spirit of Youth Association with the intention of replication and/or expansion.

WP4. Take-Back System and Policy Programme:

Once the supportive framework of WP2 is established, it is recommended to support the potential beneficiaries to walk them through the subsequent development process and to encourage the Extended Producer's Responsibility (EPR) action. For this purpose, it is recommended to mainstream take-back system policies into the development plans (or sustainability agendas) of the key EEE producers and downstream enterprises. This would enhance the collection system and would allow producers and importers to meet the obligations of the Extended Producer's Responsibility and for any enterprise to ensure.

WP5. WEEE Capacity Building Programme:

This recommended cross-cutting programme would focus on building the capacity of human resources at all levels. There is a need to provide training on how to establish WEEE collection and recycling centers, WEEE legislations, and WEEE assessment standards. The capacity building activities would include workshops, training, on-job training, and field trips to existing collection and recycling plants, and support networking and dialogue between stakeholders. Beneficiaries will consist of selected key individuals or groups from the public, private, and civic sectors.

6.2 Potential Partners:

There are different categories for the proposed partners; governmental organizations, private sector enterprises, NGOs, and International organizations. Below is a list of each category:

- Governmental organizations:
  - Ministry of communication an information technologies
  - Egyptian Environmental Affairs Agency/Ministry of State for Environmental Affairs
  - Egypt National Cleaner Production Centre/Ministry of Industry and Foreign Trade
  - Customs Authority / Ministry of finance
  - Nasreya Hazardous Waste Management Center, (Borg EL Arab) Alexandria Governorate
- Private Sector Enterprises
  - Egyptian Electronic Recycling Company – Recycler
  - CID Consulting
  - Mobinil
  - Vodafone Egypt
  - Nokia

    - Olympic Group
    - Toshiba Al-Araby
- NGOs
    - Ressala - Collection
    - Spirit of Youth – Refurbishment and Dismantling
    - Nahdet EL-Mahrousa – Incubator Platform
- International Organizations
    - Centre for Environment and Development for the Arab Region and Europe
    - Cairo Basel Convention Regional Center for Arab Countries – CBCRC
    - United Nations University – StEP Initiative

6.3 Matching Grants

Private Sector enterprises can provide funding from CSR programmes, Mobinil has provided previously funds to the Ewaste School in the informal sector. Also, ERCC would purchase collected equipments or dismantled parts.

There might be some funds available from Egypt ICT trust fund that is being operated by the Ministry of Communication and Information technologies and United Nations Development Programme.

Annex-1: Items Collected by Resala NGO in 2010

No	Item	Donated units collected	Revenue (LE)*	Unit price*
1	Clock/watch	11,219	125,553	11.2
2	Automatic Washing Machine	5,238	614,120	117.25
3	Dish Washer	817	44,250	54.2
4	Electric Water Heater	4,055	178,615	44
5	Refrigerator	7,962	1,078,604	135.5
6	Deep Freezer	1,567	201,753	128.75
7	TV	13,602	913,991	67.2
8	Video	3,053	140,290	46
9	Receiver	2,342	80,735	34.5
10	Stereo	12,893	308,013	24
11	Iron	5,518	90,957	16.5
12	Fan	11,653	413,832	35.5
13	Air Conditioner	698	102,240	146.5
14	Telephone	11,261	134,833	12
15	Vacuum Cleaner	5,659	270,162	47.75
16	Mixer	2,683	53,370	20
17	Microwave Oven	816	26,585	32.6
18	Suction fan	1,610	29,231	18.2
19	Air Heater	2,088	44,535	21.3
20	Lap Top	358	34,325	96
21	Computer Monitor	7,273	233,676	32.2
22	Computer Casing	5,707	211,605	37
23	Printer	3,347	93,833	28
24	Scanner	619	18,050	29.2
25	Key Board & Mouse	11,712	74,421	6.35
26	Sewing Machine	2,250	103,236	46
27	Tricot sewing machine	427	19,013	44.5
28	Copier	291	29,905	103
29	Video Camera	100	7,620	76.2
30	Camera	814	12,010	14.75
31	Hair Dryer	1,521	22,058	14.5
	Totals	139,153	5,711,421	41

* To conservatively approximate in USD divide by 6.

Annex-2 Stakeholders Interviewed

Attendants in the Stakeholders Consultation Meeting, held at the Ministry of Communication and Information Technology (MCIT), August 25, 2011, were as follows:

Public Sector:

- Ministry of Communication and Information Technology (MCIT):
  - Hoda Baraka, Deputy Minister
  - Hoda Shakra, Senior Engineer
  - Nevine Tawfic, Deputy Director
  - Ayman Ghoneim, Program Manger
  - Hesham Helal, IT Supervisor
- Egyptian Environmental Affairs Agency (EEAA):
  - Yasser Badreldin
- Egyptian National Cleaner Production Center (ENCPC), Ministry of Trade and Industry:
  - Ali Abusena, Deputy Director
  - Mahmoud Fathy, Manager of Wastes Department

Private Sector:

- Vodafone:
  - Noha Saad, CSR Foundation Senior Manager
  - Ahmed Gamal, CSR and Foundation Senior Specialist
- Mobinil:
  - Sherif Issa, Head of Health and Environment Department
- Egyptian Electronics Recycling Company (EERC):
  - Ahmed Salem, General Manager
  - Hatem Elborai, Chief Operating Officer
- CID Consulting:
  - Dina Beshara, Projects Coordinator

Civic Sector:

- Spirit of Youth NGO:
  - Ezzat Gendy, Manager

Multilateral Organizations:

- UNDP:
  - Nevine Abou El Gheit, Program Assistant
- CEDARE:
  - Hossam Allam, Program Manager
  - Suzy Imam, Program Assistant
  - Ahmed El-Dorghamy, Consultant

Informal Sector Field Visit Interviews, September 16th, 2011:

1- Ayman Baakat, dealer of waste metal, El-Imam El-Shafie Market.
2- Magdy Makram, dealer of waste of electrical appliances, El-Imam El-Shafie Market.
3- Abu Karam, dealer of waste of electrical appliances, El-Imam El-Shafie Market.
4- Mohamed Abu Anwar, dealer of waste of electrical appliances, El-Imam El-Shafie Market.
5- Haj Ahmed, dealer of waste of electrical appliances, El-Imam El-Shafie Market.
6- Kirolos Takawy, dealer of waste of electrical appliances, Garbage City, Moqattam.
7- Adel Aziz, dealer of waste of electrical appliances, Garbage City, Moqattam.
8- Helal Mahrous, dealer of waste of electrical appliances, Garbage City, Moqattam.

Other interviews:

1- Adel El-Shafei, General Manager of Hazardous Wastes Department of the Egyptian Environmental Affairs Agency (EEAA), personal Interview, August 16, 2011.
2- Hassan Ibrahim, Electrical Equipment Plant Quality Manager, Olympic Group, phone interview, September 11, 2011.
3- Ahmed Zaghloul, General Manager of Toshiba El-Araby Light Tubes Factory in Mubarak Industrial City, Quesna, phone interview, September 12, 2011.
4- Tarek Awwaad, Warehouse Manager, Resala NGO, personal interview, September 6, 2011.

Annex-3a: Provisions of Ministerial Decree 165 of Year 2002

Date of issuance: 5/9/ 2002

Issued by: Minister of Industry and Technological Development.

Provisions:

- **Article 1:** It is prohibited to import substances provided in the Annexed lists.
- **Article 2:** The industrial register is considered a licensing for the facility allowing use, storage, transportation, handling, and recycling of any of these substances, inside the boundaries of the facility, in the case of its generation in the facility due to the normal activities that the facility is licensed to do.
- **Article 3:** Handling and transportation of the substances outside of the facility shall be carried out as per a license from the Industrial Control Authority[42].
- **Article 4:** The lists shall be revised and updated after two years through knowledge of the General Authority for Industry and the Environmental Affairs Agency.
- **Article 5:** This decree shall be published in the official journals and will be enforced in light of the conditions put forth from the General Authority for Industry and the Environmental Affairs Agency.

[42] http://www.ica.gov.eg/Arabhomepage/main/hpmain.asp

Annex-3b: Example of list Annexed to Decree 165 of Year 2002

(Annexed) List of Hazardous waste pertinent to the Ministry of Industry and Industrial Development that prohibit importing of the following:

First: Metals wastes and wastes containing metals.

1) Metal wastes and wastes containing mixes of any of the following:
   a) Antimony
   b) Cadmium
   c) Selenium
   d) Arsenic
   e) Lead
   f) Tellurium
   g) Beryllium
   h) Mercury
   i) Thallium

2) With the exception of clean scrap metal that are not contaminated, those that include chemical mixes of metals in large volumes:

   3) Antimony scrap and its compounds
   4) Lead scrap and its compounds
   5) Beryllium scrap and its compounds
   6) Selenium scrap and its compounds
   7) Cadmium scrap and its compounds
   8) Tellurium scrap and its compounds

9) Wastes containing elements or contaminants of any of the following:
   a) Arsenic and its compounds.
   b) Metal Carbonyls.
   c) Mercury and its compounds.
   d) Hexavalent Chromium.
   e) Thallium and its compounds.

10) Galvanic sludges.
11) Liquid solvents waste from pickling processes (chemical surface treatment).
12) Residual wastes from washing and leaching for processes for treatment of Zinc, dusts, sludge, Jarosite, Hematite, etc.
13) Zinc wastes containing lead and Cadmium with concentrations sufficient to show any of the hazardous properties.
14) Ashes from burning insulated copper wires.
15) Dusts and wastes resulting from gas cleaning devices in copper smelters.
16) Electrolytes resulting from purification and extraction of copper through electrolysis and other metal extraction through electrolysis.
17) Sludge waste resulting from purification and extraction of copper through electrolysis with the exception of anode residuals.
18) Spent corrosive solutions containing dissolved copper.
19) Cupric Chloride waste and catalysts for Copper Cyanide.
20) Inert metal ashes from printed circuit boards.

21) Lead-acid battery wastes with the exception of scrap lead extracted from batteries with the condition that is clean and contained.
22) Wastes of non-categorized batteries.
23) Wastes resulting from electrical and electronic assembling or scraps containing elements from banned batteries and accumulators, mercury-containing switchgear, cathode-ray-assembled glass tubes and other types of activated glass and capacitors containing PCBs or polluting with any hazardous elements at concentrations sufficient to exhibit hazardous properties.

Annex-4: Local Private and Sector Production Data of the Central Authority for Public Mobilization and Statistics

Private Sector Production

No	Item by Unit	Year		
		2007	**2008**	**2009**
1	Electric Grill	33,224	31,569	36,550
2	Electric water Boilers	59,025	3,552	20,127
3	Computers	95,288	78,589	63,708
4	Half Automatic Washing Machines	-	21,657	26,410
5	Electric Generators	1,102	1,238	1,359
6	Electric Transformers (High Power)	1,113	4,237	2,733
7	Electric Transformers (Small Power)	59,440	166,878	49,157
8	Colored TV	1,268,548	951,375	858,840
9	Video Cassettes	10,150	4,115	-
10	Cassette Recorders	14,869	14,728	-
11	Satellite Receivers	4,313	-	-
12	Air Conditioners	543,123	745,862	782,194
13	Electric Commercial Fridges	16,017	34,442	35,338
14	Electrical Home Fridges	933,402	992,760	1,585,898
15	Deep Freezers	126,697	213,548	273,220
16	Dish Washing Machines	132,647	-	16,014
17	Full Automatic Washing Machine	386,009	501,616	4,285
18	Manual Washing Machine	215,903	35,539	562,24
19	Fans	2,754,221	3,055,710	2,135,100
20	Air Blowers	1,146,479	1,311,836	594,706
21	Vacuum Cleaners	304,503	287,711	101,192
22	Mixers	616,178	783,999	915,771
23	Egg Mixers	5,243	7,000	-
24	Hard Breaker	168,524	-	-
25	Hair Dryer	2,733	-	-
26	Irons	552,591	403,115	246,731
27	Electric Heaters for Drinks	1,800	286,900	10,500
28	Water Heaters	569,323	699,660	808,275
29	Air Heaters	659,718	898,935	27,644
30	Microwave Ovens	5,384	-	114

Public Sector Production

No	Item by Unit	Year			
		2006/2007	2007/2008	2008/2009	2009/2010
1	Air Conditioners	8,684	5,543	4,290	1,975
2	Full Automatic Washing Machines	87	4,566	452	-
3	Manual Washing Machines	-	199	-	-
4	Fans	11,445	10,091	11,144	1,759
5	Computers	10,246	12,036	9,083	4,513
6	Electric Motors with Small Power	62,329	11,393	9,128	20,666
7	Colored TVs	2,853	4,353	782	26,300
8	Radio Cassettes	3,169	3,862	15,924	5,350
9	Air Blowers	-	-	1,915	248
10	Electric Heaters	-	-	-	36,331

Annex-5 Photos in Informal Markets and Private Sector Warehouses



Used Gas Water Heaters (complete, casings, and inner parts)



Used Electric Motors with Small Power



Washing Machines (manual and Full Automatic), and Vacuum Cleaners



Fax Machines and Printers



Different E-waste Items



Old TVs and Miscellaneous



Keys, parts and accessories



View from the E-waste Market



E-waste in warehouses (in Giza) of one of Egypt's Mobile operators

Annex-6 Stakeholders Questionnaire Sheet

1 Rationales for this Survey

CEDARE and EMPA are conducting a needs assessment survey to support local initiatives in Egypt which effectively and efficiently addresses the e-waste problem. The output of the assessment will provide the State Secretariat of Economic Affairs (SECO) of Switzerland to identify projects to cooperate in implementing in Egypt.

2 Partners for the E-waste Needs Assessment Survey

CEDARE - Centre for Environment and Development for Arab Region and Europe – is intergovernmental organization based in Cairo, Egypt. CEDARE is an "enabling" agent in support of sustainable development initiatives at national, sub-regional and regional levels, stimulating the implementation of international conventions and agreements in the region. CEDARE's vision is based on activating the principle of Environment for Development.

EMPA - "EMPA is the multidisciplinary research institute for material science and technology of the Swiss Federal Institute of Technology (ETH) domain. It is specialised in applications-oriented research and development, as well as in offering services to help solving demanding problems in the fields of sustainable materials science and technology. The Technology and Society Lab within EMPA analyses the impacts of technological developments on society and the environment and is leading EMPA's e-waste activities.It is a pioneer in monitoring and control for e-waste management systems as the technical control body for setting recycling and disposal standards as well as auditing material flows through the Swiss system.

3 The E-waste Problem

The term *Electronic Waste* (E-waste) stands for any electrical or electronics appliance that has reached its end-of-life. In this survey the focus is laid on the Information and Communication Technologies (ICT) sector as this is the most problematic category of E-waste. ICT waste is a sort of E-waste and comprehends IT and telecommunications equipment like laptop computers, PC's, printers, calculators, telephones, TV's etc.

The amount of electronic products discarded globally has skyrocketed recently, with 20-50 million tons generated every year. E-waste now makes up five percent of all municipal solid waste worldwide, nearly the same amount as all plastic packaging, but it is much more hazardous. The reason for this development is the frequent upgrading of mobile phones, computers, televisions etc. Mobile phones and computers are causing the biggest problem because they are replaced most often. Developing countries are expected to triple their E-waste production over the next five years.

On one hand E-waste contains valuable materials like copper, aluminum and precious metals like silver, gold, platinum, palladium etc. The presence of elements like lead, mercury, arsenic or cadmium etc on the other hand classifies E-waste as hazardous. In the absence of suitable techniques and protective measures, improper handling of E-waste can result in toxic emissions to the air, water and soil and pose significant health and environmental hazard. Clearly, the need to build capacities for the proper and safe handling methods for E-waste is urgently required.

Name of Enterprise:

Country:

Instructions:

- Select any answer that is applicable by clicking on the box ☐ → ☒.
- Please save the file as *NameOfOrganization* and send it back to: *ewaste@cedare.int*

1. Type of Organization

☐ Governmental ☐ NGO ☐ Private sector

☐ International ☐ Regional

☐ other:

2. Role of your organization

☐Use ☐ Sell ☐ Refurbish ☐ Dismantle/ Recycle

☐ Producing legislations and regulations

3. Kindly provide description about your organization and its role in the E-waste management issue (this will be included in the report)

4. Select areas that you recommend to be included in proposed programme of work for E-waste Management in Egypt:

☐ Enhancing policies and regulations ☐ raising awareness programme

☐ Refurbishment ☐ Capacity building

☐ Extended producer responsibility scheme ☐ recycling

☐ Accreditation and certification for recyclers

☐ Others, please specify:

5. Which E-waste project (past, ongoing, future) did/will you implement in the Egypt? (Please provide project reports if available)

	Title of Project/ Website	*Year (start – end)*	*Country*	*Aim(s) of the project*	*Partners*
1	*I*				
2	*I*				

3	/				
4	/				

Comments and additional information:

For Recyclers

6. What are the annual amounts (tons) your company is processing?

Computers, servers, screens Mobile Phones Others

For Private sector enterprises and NGOS:

7. In which sector is your organization active?

☐ Selling **ICT**[1] equipment ☐ Providing ICT services

☐ Producing ICT equipment ☐ Mobile phone operator

☐ Dismantle/ Recycle ☐ Other, please specify:

8. Does your organization implement take-back policies and/or recycling actions?

☐ Yes, the following policies are implemented:

- ☐ Subcontracting companies to implement take-back and/or recycling actions
- ☐ Own provided take-back and recycling actions
- ☐ Others please specify:

☐ No policies implemented

9. If your company has take-back policies, what happens to ICT equipment?

☐ Re-sell ☐ Refurbishment ☐ Recycle (material recovery)

☐ Treated as solid waste - where does it go?

- ☐ Landfill ☐ exported ☐ informal E-waste sector
- ☐ Others; please specify:

10. If your company has take-back policies, what are the annual amounts (tons) your company is taking back?

Computers, servers, screens Mobile Phones Others

11. **Further Needs** of your organization

12. **Suggestions** to develop the sector:

Please save the file as: ***Q4_NameOfOrganization*.doc**
and send it back to: ***ewaste@cedare.int***

Thank you very much for taking time to complete this form!
Organization:

Name:	Job Title:
Preferred means of contact:	Email:
Fax:	Telephone:
PO Box:	Postal Code:
Street:	City:
Country:	Website: