



EXTENDED PRODUCER RESPONSIBILITY

Assessment Report



SUSTAINABLE
RECYCLING
INDUSTRIES

2017

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I



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Acronyms

Acronyms

- ▶ The Centre for Environment and Development for the Arab Region and Europe (CEDARE)
- ▶ Environmental Compliance Office (ECO)
- ▶ Extended Producer Responsibility (EPR)
- ▶ Environmental Protection Agency (EPA)
- ▶ Electronic Products Recycling Association (EPRA)
- ▶ European Union(EU)
- ▶ Electrical and Electronic Equipment (EEE)
- ▶ Electronic Product Stewardship Canada (EPSC)
- ▶ Environmental Handling Fee (EHF)
- ▶ Federation of Egyptian Industries (FEI)
- ▶ Gesellschaft für Internationale Zusammenarbeit (GIZ)
- ▶ Industry Stewardship Plan (ISP)
- ▶ Individual Producer Responsibility (IPR)
- ▶ Information and Communications Technology (ICT)
- ▶ Law for the Recycling of Specific Kinds of Home Appliances (LRHA)
- ▶ Law for the Promotion of Effective Utilization of Resources (LPUR)
- ▶ Middle East and North Africa (MENA)
- ▶ Ministry of Environment (MOE)
- ▶ Ministry of Economy, Trade and Industry (METI)
- ▶ Ministry of Environment and Waters (MOEW)
- ▶ Monitoring and Evaluation (M&E)
- ▶ Manufacturers Recycling Management (MRM)
- ▶ Memorandum of Understanding (MOU)
- ▶ Ministry of Communications and Information Technology (MCIT)
- ▶ National Solid Waste Management Program (NSWMP)
- ▶ National Environmental Standards & Regulations Enforcement Agency (NESREA)
- ▶ National Environment Management Authority (NEMA)
- ▶ Organization for Economic Co-operation and Development (OECD)
- ▶ Producer Responsibility Organizations (PROs)
- ▶ Panasonic Eco Technology Center (PETEC)
- ▶ Qatar Telecom (QTel)
- ▶ Resource Conservation and Recovery Act (RCRA)
- ▶ Research and Development (R&D)
- ▶ Sustainable Recycling Industries (SRI)
- ▶ Sustainable Development Goals (SDGs)
- ▶ Third Party Organizations (TPO)
- ▶ Waste Electrical and Electronic Equipment (WEEE)

II



*Executive
Summary*



The private sector is a central player in upholding ecological and sustainability stewardship and materializing it into actionable schemes, all of which lies at the heart of the concept of Extended Producer Responsibility (EPR). EPR is defined as a conceptual framework intended to shift the environmental responsibility of a product's design, manufacturing, usage and disposal to producers.

This assessment is meant to provide international practices on EPR and its implementation models, while providing a synopsis on the status of EPR in Egypt. It puts forth a set of suggestions to support the promotion and the gradual implementation of EPR and its schemes.

The main recommendation is:

The need to build up on consultation and stakeholder dialogue that several ministries and stakeholders have already initiated. The outcomes of these consultations should be adopted and used as the basis for continued dialogue. This participatory approach is essential to come up with a consensus to design an EPR policy framework for Egypt.

This suggested Framework should tackle:

- ▶ Regulations
- ▶ Policy incentives
- ▶ Private sector engagement
- ▶ Access to local recycling infrastructure
- ▶ Access to information
- ▶ Viable pilot EPR models
- ▶ Financial incentives

III



Scope & Purpose of the Report

The gradual and growing awareness of the concept of EPR and take-back systems in Egypt and its significance as a tool to propel forward a thriving recycling industry and waste minimization have not been properly or comprehensively addressed. Even though there is a certain awareness about the concept among local sustainable development experts and environmental practitioners, the concept remains mostly vague and obscure to other community stakeholders that include the Egyptian government decision makers, industrialists and business associations.

In the same light, there are not enough reports and research studies that have addressed EPR practices in Egypt, if any.

With the exception of a few background papers led by the Centre for Environment and Development for the Arab Region and Europe (CEDARE), there remains a need to create knowledge and access to information through studies and reports regarding the status of EPR in Egypt.

This research is intended to form the basis of a primary assessment study that relates and depicts EPR in the electronics industry as part of greater efforts to create a management system for e-waste or Waste of Electrical and Electronic Equipment (WEEE) and products. It is a deliverable and activity of the SRI “Sustainable Recycling Industries”⁽¹⁾ program.

The SRI has the following 4 objectives:

- 1 A Recycling accreditation system to introduce recycling standards and initiates the conformity assessment system in Egypt.
- 2 The implementation of a youth incubator program for e-waste recycling in the informal sector.
- 3 Promoting an EPR system, that aims to develop incentive mechanisms under the principle of Extended Producer Responsibility (EPR).
- 4 Capacity Building, that aims to enhance the capacity of all stakeholders and entrepreneurs involved in the project.

The report showcases globally adopted variant EPR models in the e-waste field along with different incentive schemes. Additionally, it aims at shedding the light on international practices by region, country and even voluntarily initiatives led by companies. The report also presents a brief situational analysis of the status of EPR in Egypt and benchmarks local existing efforts to international EPR practices and operational EPR systems. It ends with a number of suggestions that can outline a roadmap for creating an EPR policy framework in Egypt.

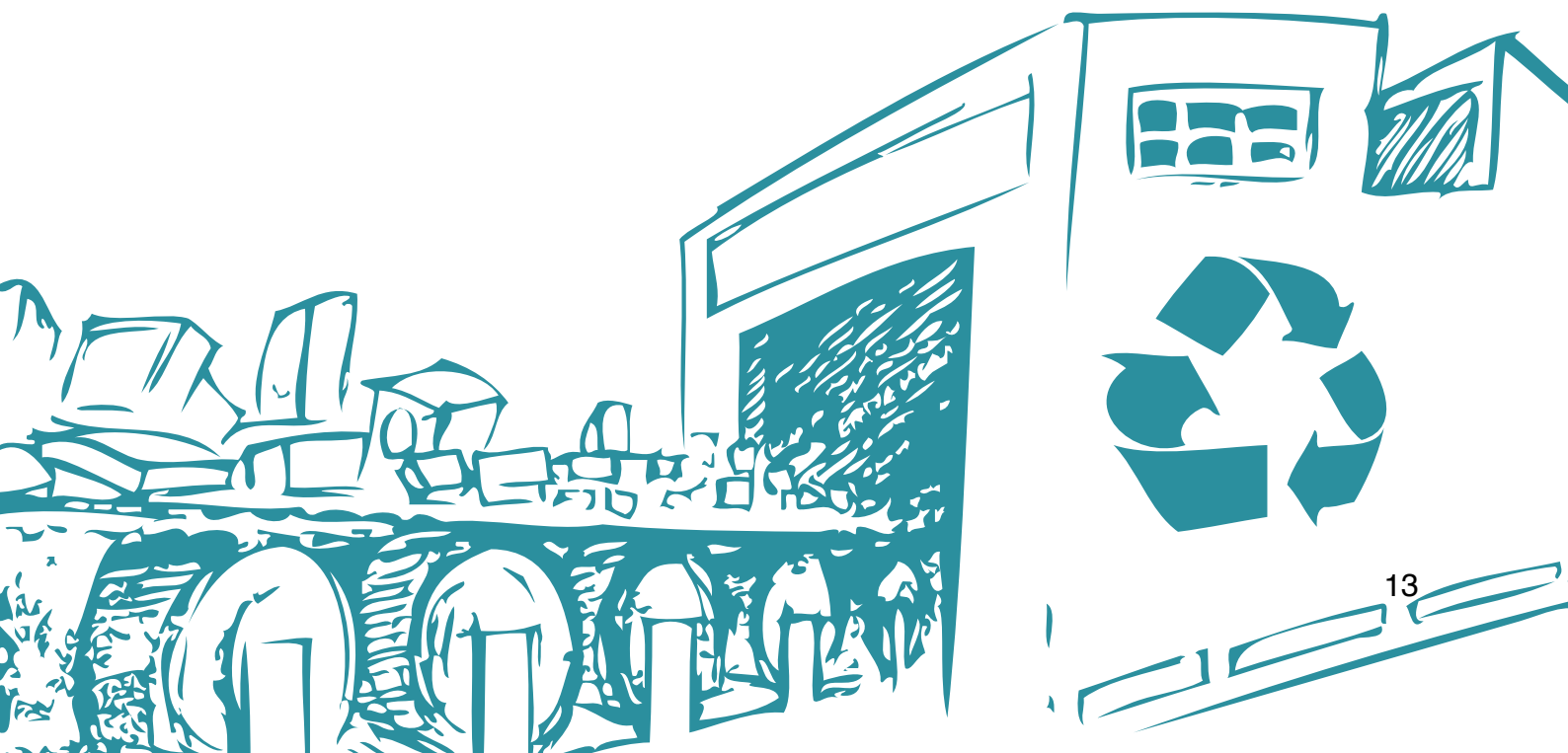
(1) For more information about the SRI project please visit: <https://sustainable-recycling.org/recycling-initiatives/egypt/>

IV



Methodology

The assessment is of a qualitative nature based on expert observations, select number of phone interviews and the outcome of EPR consultations that have been conducted by the Egyptian Ministry of Environment (MOE), German Assistance in Egypt (GIZ) and the Federation of Egyptian Industries (FEI). In addition to international reports, policy briefs and research on EPR in Egypt conducted by experts.








V



Introducing EPR

A Definition & Background

Adopted understanding and definition of EPR usually covers a wide range of products. Examples include:

-  Packaging
-  Tires
-  Electronics
-  Electric equipment
-  Batteries, among others.

This study has a special focus on e-waste as part of the management of Waste Electrical and Electronic Equipment (WEEE).

In general, EPR is a policy concept that calls for shifting complete or part of the responsibility and costs of recycling and/or disposal of products at their end of life term (after usage by consumer) to the producers who have designed and manufactured and/or sold the product to the consumer in the first place. EPR was first introduced as a voluntary tool by producers, but with its widespread usage in Europe and Asia it has become of a legislative nature, and has been rigorously enacted in countries like Austria, Germany, Belgium, France, the Netherlands, Sweden, Japan, Taiwan, Korea, UK and Canada.

A widely used definition of EPR states that:

“Extended Producer Responsibility (EPR) is a policy principle to promote total life Cycle environmental improvements of product systems by extending the responsibility of the manufacturers of the product to various parts of the entire life cycle of the product, and especially to the take-back, recycling and final disposal of the product”⁽²⁾ (Lindhqvist, 2000)

According to Lindhqvist⁽³⁾ who first coined the term of EPR in Sweden, the extent of the liability of the producer is determined by legislation and may cover different parts of the life cycle of the product, including usage and final disposal. His definition denotes that the main ownership and liability for environmental damages of usage and disposal of a product is given to the producer.

Although his introduction of EPR first targeted Europe; it became more widely known when the Organization for Economic Co-operation and Development (OECD)⁽⁴⁾ published a comprehensive guidebook in 2001⁽⁵⁾ to introduce EPR and its practices.

The OECD’s guidebook highlighted EPR as a significant component of integrated waste management strategies and approaches adopted by governments. It is perceived as a tool to promote and support e-waste management and electronic re-use and recycling. It was showcased as both an environmental and economic policy tool to support environment and minimize the adverse economic, social and health of waste disposal through harmful means or even through landfills.

(2) Lindhqvist, Thomas. *Extended Producer Responsibility In Cleaner Production: Policy Principle To Promote Environmental Improvements Of Product Systems*. Lund University, 2000.

(3) The beginning of EPR can be traced back to 1975 when Swedish enacted its waste recycle and reuse act. It was first coined by Thomas Lindhqvist in the report to Swedish Environment Department. In 1991 the Ordinance on Avoidance of Packaging Waste was enacted in Germany. EPR have spread across industrialised countries, industry sectors, product categories, and waste. It was specifically promoted by the OECD. In April 2016, OECD issued an update to the guidelines.

(4) In 2001, the OECD produced a Guidance Manual to support the development of EPR systems through the provision of general guiding principles, outlined possible options, and their validity.

(5) The Guidebook was drafted to provide a clear understanding of EPR and how to create implementation models for it. An update has been published for this guidebook in 2016.

EPR's importance as a policy tool is particularly relevant to the electronics industry and its current status. In recent decades, with the growth of the electronics market globally juxtaposed by a growing global concerns related to material scarcity, energy deficiency, climate change and rapid environmental deterioration, a need aroused to promote WEEE recycling industry. Traditional end-of-life options like landfill and incineration are no longer prevailing in the treatment of WEEE.

At the same time the harmful health impact of environmentally unsound disposal methods for the disposal of electronics has come under the microscope with the increasing global inflow of E-waste from and to Africa and developing countries. Consequently, recycling, remanufacturing, and reuse are being strongly encouraged.



EPR has the ability to address the above mentioned concerns as it requires a change of the overall production processes for a product by producers or vendors to minimize the overall environmental footprint over the whole life cycle of the product.

As such, producers are expected to innovate in order to change their production methods upstream and downstream of the supply chain of the product. Therefore, it is essential for them to move towards more ecological approaches in dealing with reducing materials resources and energy consumption, increasing recyclable substances, extending the useful life of products, encouraging the recovery and the reuse of components among others.

Among the available plethora of tools to promote environment friendly products and waste minimization, EPR is of a special interest. It targets the changing behavior of producers and vendors rather than working on government or direct consumers alone.

Thus, it promotes what can be categorized as “Corporate Environmental Responsibility” of companies.⁽⁶⁾

EPR has three main forms that provide the bases for designing an implementation scheme for EPR⁽⁷⁾.

- 1 **Economic/financial:** whereby the producer will cover all or part of the expenses, for example, for the collection, recycling or final disposal of the products.
- 2 **Physical:** whereby the manufacturer is involved in the physical management of the products and their end of life disposal including recycling.
- 3 **Informative:** supply information on the environmental properties of the products they are manufacturing and the importance of reuse, recycling and safe disposal.

B Allocation of Responsibilities and Stakeholders

As explained above, EPR transfers or distributes responsibility of product disposal at end of life from the government. Below table 1 maps EPR related stakeholders.

(6) It is becoming a used term to emphasize the environmental responsibility of companies rather only their social and community responsibilities.

(7) Lindhqvist, Thomas. *Extended Producer Responsibility In Cleaner Production: Policy Principle To Promote Environmental Improvements Of Product Systems*. Lund University, 2000.

Product life Cycle /Stakeholders and Players			
Traditional Scenario without introducing EPR			
Design & Production	Sale/Distribution	Usage	Disposal
Manufacturer	Vendor/retailer (could also be the manufacturer as well)	Customers	Government Local authorities and private sector responsible for waste management
Scenario that incorporates EPR			
Design & Production	Sale/Distribution	Usage	Disposal
Manufacturer (who can integrate the cost of disposal of the product through pricing and adopting eco-design)	Vendor/retailer (could also be the manufacturer as well)	Customers	Manufacturer/retailer public and private waste management operators Recyclers Local authorities

Producer’s responsibility consists of design, management, and finance schemes and programs for end-of-life management of their products as a condition for sale. The producer can have financial or physical responsibility or both. The producer is also held liable to environmental damage through the “polluters pay” principle and its costs, in addition to having the liability to inform retailers and customers about the environmental repercussions of their products.

The government is responsible for putting regulations and mandates to introduce and enforce EPR. The government can even design the implementation schemes of EPR or it can leave it to producers to design their own different and independent schemes.

The government should set performance requirements for producers and should act as an enforcer to ensure that EPR implementation initiatives and systems are operating with maximum efficiency but with minimal government intervention.

It is also responsible for information dissemination on EPR, providing incentives to the private sector and producers and educating the public on EPR and its importance. It is also responsible for setting standards and certification to formalize the process and put a strategic framework for EPR mainstreaming into the e-waste management system.

Retailers/vendors can have the option of selling product brands that are made by producers that have a form of EPR implementation scheme such as take back systems. Vendors and retailers have the responsibility to inform customers how to access information on take back systems and the recycling of products after usage.

Consumers on the other hand, have a responsibility to use electronic products in such a way so as to reduce waste, promote the reusing products, and make conscious purchasing decisions based on available information about product impacts and benefits. If the products they purchase incorporate take-back and other collection and EPR programs, then they should return the used products to ensure a safe and environmentally sound end-of-life management process.

C Benefits and Challenges of Implementing EPR

EPR by the virtue of its definition promotes:

- Environmental friendly or eco designs to encourage cost effectiveness and pollution prevention;

- ▶ Responsible usage of electronics;
- ▶ The Reuse and, refurbishment of used products
- ▶ The use of nontoxic materials and processes;
- ▶ The development of more durable products;
- ▶ The development of more reusable and recyclable products;
- ▶ Minimal disposal to landfills/incineration;
- ▶ Safe disposal of harmful materials;
- ▶ Improved resource efficiency material inputs and energy consumption;
- ▶ Reduced pollution from production and waste treatment;
- ▶ Innovation for more efficient design and production;
- ▶ The creation of profitable business opportunities and a niche industry in the form of recycling;
- ▶ The contribution to a circular economy and promotes Sustainable Production and consumption, thereby directly contributing to the fulfilment of the Sustainable Development Goals (SDGs).

However, introducing EPR in developing economies such as Egypt can face certain challenges that should be taken into consideration, and the government should adopt mitigation policy packages when introducing EPR. These challenges include:

- Lack of knowledge and awareness of EPR and its models of implementation on the government and public level;
- The need for access to information, knowledge sharing and studies to suggest EPR frameworks suitable for the Egyptian context;
- Lack of a pool of experts that can promote and support the design and implementation of EPR schemes;
- The need for a champion and/or a platform that can lobby for EPR related policies with producers, manufacturers and local industrialist;
- Unavailability of a market readiness study to assess the suitability and readiness of local producers in designing and adopting EPR and related tack back systems;
- Lack of existing incentives to encourage producers to adopt EPR related schemes;
- Lack of existing bodies that can be considered collective producers platform to implement and operate EPR programs;
- Lack of existing knowhow and institutional capacity to operate and support the implementation modes of EPR (Both private and public). High cost of operation of EPR programs due to multi-stakeholder involvement;
- The need for regulations and government level policies to support the design and monitoring of EPR programs;
- Lack of an integrated e-waste management system in Egypt including the unavailability of proper nationwide collection systems, dismantling and treatment facilities and precious metal extraction technologies; and
- Predominance of the informal sector in collecting and treating of e-waste with dire health and environmental hazards.

Voluntary versus legislation/compulsory: EPR implementation schemes can be implemented on a voluntary basis – often via corporate social responsibility. However more and more countries are considering EPR as mandatory or a combination of both (such as negotiated agreements between governments and industries). Across Europe EPR is compulsory via mandatory legislations and regulations vary from imposing physical responsibility to imposing financial responsibility.

Individual Producer Responsibility (IPR) versus collective producer responsibility (CPR): EPR models and related legislations may also be based on individual producer effort, where each producer is responsible for their line of product category or based on collective efforts and platforms in the form of combined EPR programs. Such programs are known as collective EPR schemes, whereby entities such as producer responsibility organizations (PROs) or third party organizations (TPO) are established to conduct the collection or take back, dismantling and recycling on behalf of the producers on the level of an industry or sector as a whole. PROs⁽⁸⁾ are widespread in Europe especially for the WEE sector.

The legal status of PROs also varies according to sector and country specific conditions. PROs can be non-profit organizations or government agencies or quasi-governmental. They can also be for-profit firms. Countries in which more than one PRO operate have developed national registers to keep track of overall volumes sold and collected as waste within their country for each producer. In some EPR implementation countries a single PRO is established and is responsible for all collection and waste management activities of a sector or an industry. In other countries, companies may have the option of working independently through their own implementation programs. Finally in some countries several PROs exist and mimic a competitive market in which firms compete for business.⁽⁹⁾

PROs have certain advantages including the promotion of collective bargaining, the generation of economies of scale, and the reduction in costs for participants. In the e-waste sector, the use of PROs is dominant and it is the most popular model worldwide. Governments often stipulate a set of targets for reuse and targets for recycling of products as part of EPR and as a way to monitor the impact of EPR and producer performance in relation to amount and volume of production.

Voluntary and/or Mandated product “take-back” systems: is a popular EPR implementation model and the most adopted one on a global level. It gives the physical responsibility of electronic product disposal at the end of the useful life to the producer or a collective body of producer along with the financial responsibility of reuse, recycling and final disposal. The structure of a take-back system is made up of three main features⁽¹⁰⁾ (elaborated details in table 2 below):

- 1- Collection
- 2- Processing including pre-processing and End processing
- 3- Managing the flow of products and sustainability of the system
- 4- Financing schemes

(8) PROs organize and administer the collection and recycling of waste on behalf of producers. They subcontract collection companies and recyclers. They typically charge a fee for their services. These costs include costs of collecting, and treatment. The PRO may receive income from the sale of recyclable materials to recycling companies.

(9) Working Party on Resource Productivity and Waste, Extended Producer Responsibility - Updated Guidance. OECD, 2016.

(10) Expert Observations

Structure of Take Back Systems ⁽¹¹⁾	
Modes of Collection for take-back systems	Permanent drop-off facility, Special drop-off events Special drop-off points (at retailers for example) Door to door collection
Modes of Processing	<u>Pre-processing</u> Separation of products Primary Dismantling Secondary dismantling <u>End Processing</u> Reuse of certain components Recycling of certain components Recovery of precious metals Or Exporting certain components Final disposal through landfill or incineration
Modes of Management	PROs Producers Individually Government entities (partial/supportive management)
Financing Schemes	<u>Financing Methods</u> - Adopting eco-designs that are cost effective to offset the costs of EPR - using recycling materials to offset/ partially at least the cost of EPR - Including the cost of EPR in final Retail price (resulting in a price increase) - Lower sales or profit margin to offset the cost of EPR <u>Parties</u> - Producers - Consumers <u>Financing Model</u> - Producer paying compliance fees for third party (by number of units or weight of unit) - Producer directly paying for the whole EPR scheme

Producers are responsible for setting up supportive system for collection, take-back and recycling (processing). Governments may require each producer to meet specific recycling or collecting rate targets, either on a voluntary or mandatory basis. Some EPR implementation programs provide incentives for consumers to return the used product to a specified location, such as the selling point. In this context, take-back regulations sometimes mandate that particular product component be recovered and recycled.

It is worthy to mention that WEEE is the most frequent target of takeback regulations and systems globally. For example, the European Union (EU) mostly adopted EPR take back systems.

Tools and instruments to implement EPR schemes especially take back systems include⁽¹²⁾ economic, informative and administrative tools intended to facilitate EPR implementation Schemes

(11) Expert Observations

(12) Guiding Principles to Develop E-Waste Management Systems and Legislation. The Step Initiative, 2016.

A. Economic Instruments:

1. Deposit and refund EPR scheme is a model that re-directs the physical responsibility of collection, dismantling, recycling and final disposal to producers or vendors or customers. It is a type of product take-back system that refers to creating a fund or a collective pool fund. A deposit is made by manufacturers, importers and sometimes by customers through the final retail price of certain products into a fund. Consumers are given a refund when returning the products to the dealer or treatment facilities.

2. Advanced disposal and recycling fee is a tax paid in advance by manufacturers to cover the cost of collection or recycling of a product and it is often collected at the selling point or retailer shops, thus it is usually paid by customers (As part of the overall price or as an additional fee to be paid when purchasing the product). Fees are evaluated by weight or per unit of product sold. In this model, producers are accountable for all costs for processing waste. However, a system needs to be set up for the physical collection and recycling. The fee is paid to the government in return for collection and recycling.

3. Fees at time of disposal: Sometimes fees for disposal are directly collected at the time of product disposal instead of being collected in advance. However, an advanced fee is more frequently used.

4. Fixed or Flexible fees for disposal and recycling: Some systems determine a unified fee per product category while others are promoting a flexible fee structure based on product components and costs of recycling based on brand and model and related technical specs.

5. Recycling Subsidies are used to stimulate recycling markets. These subsidies could be in the form of subsidies paid for the collection of materials for recycling, subsidies paid to reprocessing firms, or subsidies to users of recycled materials.

6. Material taxation is an indirect tool that can promote the adoption of EPR schemes by taxing raw materials for manufacturing so as to create incentives to use secondary (recycled) or less toxic materials.

7. Tradable recycling credits is a relatively newer instrument designed to promote recycling. It could be based on a caps or ceiling system or based on performance. Through its design and implementation it could impact recycling rates and the content of the recycled components.

B. Informative Instruments:

8. Regulations and requirements that include compulsory reporting to authorities, labelling of products and components, stakeholder meeting and access to information to consumers also facilitate the operation and on the implementation of EPR schemes.

C. Administrative Instruments:

9. Include regulations pertaining to the physical collection of discarded products and compliance with environmentally sound treatment standards and product standards. Other examples include: substance and landfill restrictions, collection, reuse (refill) and recycling targets and minimum recycled material content standards.

VI



*Global EPR Trends
and Practices*

A Global Outlook:

After reviewing the different models and instruments that can be used to implement and introduce EPR, it is important to highlight the growing trends of EPR adoption globally. This will aid in identifying the best practices of Models and instruments that may vary from one region to the other or even a country to the other.

Table 3 below attempts to map EPR models and practices globally through clustering when valid:

Global Trends in EPR Implementation		
Regions	EPR Models	Status and Developments
Africa	<p>Although most African countries do not have EPR related legislation</p> <p>There is a case of introducing EPR regulations, takeback systems and collection centers, and introducing an administration fees for end of life on products</p>	<p>Nigeria has adopted the National Environmental (Electrical/Electronics Sector) Regulations S.I. No. 23 of 2011 that is based on the life cycle approach, according to which producers, importers and retailers are responsible for taking back end-of-life of EEE and establish collection centers. Producers are also responsible for the transportation of the collected EEE from the centers to the National Environmental Standards & Regulations Enforcement Agency (NESREA) accredited recyclers. Since most EEE are not locally produced but rather imported, importers of new and/or used EEE are obliged to pay an administrative fee to registration requirements and the description of allowed items among other.</p>
MENA	<p>There is a need to introduce legislations and there is a need for a greater role of governments.</p> <p>Only voluntary initiatives by companies and pilot projects have been implemented. On the other hand Turkey has taken legislative steps to introduce EPR</p>	<p>Laws and regulations is a key challenge to developing the e-waste sector and enforcing environmental protection measures including EPR. Most of the Gulf area along with Egypt and Jordan and Lebanon do not have EPR regulations as of yet. The Turkish Regulation on the Control of Waste Electrical and Electronic Equipment was issued in 2012. Accordingly, producers are expected to both collect and recycle e-waste either by themselves or through authorized non-profit associations. They are also required to bear the transport cost of household e-waste. The authorized institutions are expected to operate through a cooperation centers that determine waste pick-ups from collection centers and provide reports to the government among other functions.</p>
Asia	<p>Take Back systems are often adopted. The responsibility varies from municipalities, to sometimes manufacturers and also some countries have PRO models for collection</p>	<p>In East Asia, several countries that include Japan, South Korea, Taiwan, China and Thailand have adopted legislative measures to promote the proper and safe management and recycling of used electronics through EPR-based models of e-waste management systems. Three of the continent's industrialized economies, namely Japan, South Korea and Taiwan, have over a decade of experience in adopting EPR-based recycling and waste management systems⁽¹³⁾.</p>

(13) Lee, Soo-cheol and Sung-in Na. E-Waste Recycling Systems and Sound Circulative Economies in East Asia: A Comparative Analysis of Systems in Japan, South Korea, China and Taiwan. Sustainability Online. 2010

Global Trends in EPR Implementation		
Regions	EPR Models	Status and Developments
EU	The designed and implemented take back systems shifting partially and sometimes completely the responsibilities to the producers. PROs were created to facilitate and organize implementation of these systems	Almost all EU Member States have incorporated the principle of EPR through mandatory take-back systems that require producers of EEE to fulfil their “collective responsibility” for the end-of-life management of their used products while relying on Producer Responsibility Organizations (PROs). Producers are therefore financially responsible for the proper treatment and recycling of the collected WEEE. Producers are also responsible for providing information on the environmental impacts of their products at end of life as well as options for discarding the used products.
USA	U.S. does not have federal legislation on e-waste management and recycling. Most states have independently adopted ‘product stewardship’ programs rather than EPR programs.	Product stewardship in the U.S. refers to voluntary or regulatory approaches to minimizing the environmental and social impacts of products and their packaging throughout their produce lifecycle, whereas EPR refers to mandatory approaches that require producers to take the financial and physical responsibility of managing used products ⁽¹⁴⁾ . Collection is managed through recycling drop-off centers that are run by for-profit organization, non-profit organizations, local governments, or managed through take-back programs.
Latin America	Takeback systems with mainly shifting financial and physical responsibility are mainly prevalent in countries where there is a legal framework for EPR. Other countries with no legal EPR framework, have voluntary initiatives.	Several countries, including Argentina, Brazil, Colombia, Chile and Mexico have taken remarkable steps towards implementing their EPR-based e-waste management systems and enacting e-waste specific legislation ⁽¹⁵⁾ . Examples of countries with no specific laws or bills on WEEE, but with general waste management legislations are Uruguay, Venezuela and Paraguay.

To sum up international trends it can be perceived that:

- ▶ EPR is mainly introduced through government sponsored regulations and legislations.
- ▶ Mainly the most relevant models is takeback systems where physical and financial responsibility is mainly shifted to the producers
- ▶ Producer Organization Platforms or collective centers supported by municipalities are the main forms of bodies overseeing EPR Schemes implementation.
- ▶ EPR remains in the form of voluntary private sector initiatives, in countries and regions that do not have legislations.

B Different EPR Models based on Country Practices:

Takeback Systems in Japan a mixed model approach based on type of electronics being disposed of: The Home Appliance Recycling Act is considered to be the country’s main EPR model. It came into force in 2001, and was predominantly in response to an increasing scarcity in

(14) The Product Stewardship Insititue. Electronics EPRS: A Case Study of State Programs in the United States. OECD Online. 2014

(15) United Nations University (UNU). E-Waste in Latin America - Statistical Analysis and policy Recommendations. UNU Online. 2015.

landfills in which hazardous material and residues from electronic shredder dust were disposed⁽¹⁶⁾. It targets specific household appliances, namely air conditioners, TVs, refrigerators and freezers and finally, washing machines and clothes dryers. Personal computers and other small electronic equipment are covered by other legislations, including Law for the Promotion of Effective Utilization of Resources (LPUR) and the Small Electrical and Electronic Equipment Recycling Act⁽¹⁷⁾⁽¹⁸⁾.

“Promotion of Recycling of Small Waste Electrical and Electronic Equipment” Act of the year 2013 issued by Japan’s Ministry of Economy, Trade and Industry (METI) and Ministry of the Environment (MOE)⁽¹⁹⁾. It is a measure to promote and encourage recycling of more than 100 items that include digital cameras and cellular phones. In light of role-sharing nature of the Act, municipalities play the role of the collectors from both consumers and businesses. The collected WEEE are then dismantled and recycled by government-certified operators. Finally, manufacturers bear the responsibility of enhancing their product design by producing recyclable goods and utilizing recycled inputs and resources. METI set a recycling target of 140,000 tons per year by fiscal 2015 (based on around one kilogram per person annually).

In the context of the Home Appliance Recycling Act, manufacturers are required to establish collection points, and have organized two competing groups (a multiple PRO model) to meet their taking-back and recycling obligations: One group has established its own recycling facility and another that has commissioned operators to perform their recycling obligations as per defined recycling rates. To enhance the efficiency of the collection process, collection points take in products from both groups, rather than sorting the used products by manufacturer.

Retailers collect waste home appliances, or take back old appliances from customers when they buy new products. They are also responsible for transporting the end-of-life products to designated collection points or contract certified operators to carry out this obligation on their behalf. Municipal authorities collect and treat used home appliances outside the scope of the Home Appliance Recycling Act, which are mostly illegally dumped appliances. Finally, the national government promotes R&D, offers environmental education and publishes data on annual recycling performance.

Japan is an example of countries that do not adopt a “producers-pay-government-distributes” approach, for the fee is paid by consumers and managed by PROs. The fee is displayed to consumers at the time of purchase and collected at the time of disposal. Consumers also are responsible for returning waste home appliances to retailers for recycling.

Takeback system shifting full responsibility on the producers in Colombia: In 2013, Colombia adopted Law 1672 to regulate the safe and environmentally sound management of e-waste and define the responsibilities of all actors along the chain, which is considered the legal framework for the country’s first EPR system⁽²⁰⁾. According to the Law, producers are both financially and physically responsible for the proper management of WEEE during all phases, starting from collection to recovery and final disposal. Producers can meet their obligations individually or under a collective scheme, most notable examples of such schemes are PROs. All participating waste management companies are required to obtain an environmental license issued by a regional environmental authority and comply with national and local environmental requirements.

(16) Hotta, Yasuhiko, Atsushi Santo and Tomohiro Tasaki. EPR-Based Electronic Home Appliance Recycling System under Home Appliance Recycling Act of Japan. OECD Online. 2014.

(17) Chung, Sung-Woo and Rie Murakami-Suzuki. A Comparative Study of E-Waste Recycling Systems in Japan, South Korea and Taiwan from the EPR Perspective: Implications for Developing Countries. Institute of Developing Economies Online. 2008

(18) Japanese Ministry of Environment. Law for the Promotion of Effective Utilization of Resources. Japanese Ministry of Environment Online. Downloaded from (<https://www.env.go.jp/en/laws/recycle/06.pdf>).

(19) Japanese Ministry of Environment. Japan Environment Quarterly. Volume 2. July 2013. Japanese Ministry of Environment Online. 2013.

(20) Legal Secretary of the Mayor’s Townhall of Bogota. Legal Text of Law 1672 of 2013. Alcaldiabogota Website (<http://www.alcaldiabogota.gov.co>). Full Reference (<http://www.alcaldiabogota.gov.co/sisjur/normas/Normal.jsp?i=53825>)

Consumers have to separate the covered e-products and are required to return these to collection points. Producers are therefore required to provide consumers with information about the proper return of their products.

Suppliers and retailers are a key logistical support to producers by accepting used products from consumers at no cost and for providing a space for producers to place collection containers. Municipalities play an important role in raising the awareness of the community and consumers through educational programs to inform them about their duties and responsibilities.

The role of provincial government, PROs and advanced disposal fees in the case of Canada: There is no federal legislation on e-waste management in Canada, which is predominantly set at the provincial level in the form of EPR-based regulations or product stewardship programs for certain electrical and electronic products. In the former, the responsibility lies with the producers who internalize the cost or pass it on to consumers, while municipal and provincial governments assume responsibility in the latter and use public funds or legislated environmental fees to finance such programs⁽²¹⁾. The majority of Canadian provinces have laws requiring EPR-based approaches to manage e-waste, including computers, printers and photocopiers.

EPR implementation in Canada requires provincial governments to develop and monitor regulations for the management of e-waste. They set performance targets, oversee implementation and devise compliance measures. The federal government plays more of an indirect role in regulating the inter-provincial and transnational movement of toxic and hazardous waste.

Producers can implement take-back programs upon submitting an industry stewardship plan (ISP) or join an industry collective to have a third party perform their obligations. An example of such third parties is producer responsibility organizations (PROs). Producers have to register with PROs to manage and operate the e-waste stewardship program on their behalf.

PROs may assume the role of collectors if contracted by municipalities, or establish collection points. They also contract approved and authorized WEEE processors and recyclers.

Retailers or first importers are required to charge and collect an environmental handling fee (EHF), also known as an advance disposal fee, from consumers at the point of sale, report sales and remit the collected fees to the PROs. Whenever applicable, retailers should take back used products from consumers at no-cost and should provide consumers with information about the EPR program.

Finally, one unique feature about the EPR model in Canada is the use of the aforementioned EHF. These fees are determined on a per unit basis, and vary from one province to another depending on the cost associated with collection, transportation and processing. They are reviewed and adjusted as required and are only charged once along the supply chain, even if retailers choose to pass it on to the final consumers. Retailers can either incorporate the EHF as part of the final product price, or display it as a separate charge on the sales receipt.

Creating the PRO model in Switzerland: Switzerland has been among the global forerunners in establishing an EPR-based model for the management of WEEE. The Swiss Federal Office introduced the first legislative measure on WEEE for the Environment in 1998, but Producer Responsibility Organizations (PROs) had launched several voluntary initiatives long before the law was enacted. The Ordinance on the “Return, the Taking Back and the Disposal of Electrical and Electronic Appliances” (ORDEE) of 1998 forms the legal basis of the Swiss e-waste management system and defines the majority of responsibilities pertaining to the different stakeholders.

In Switzerland, PROs are responsible for the management of collection, transportation and control systems of WEEE. The two largest PROs are the Swiss Association for Information, Communication and Organizational Technology (SWICO) and the Stiftung Entsorgung Schweiz System (SENS).

(21) Government of Canada. Environment and Climate Change Canada. Extended Producer Responsibility. Government of Canada Website. Downloaded from (<https://www.ec.gc.ca/gdd-mw/default.asp?lang=En&n=FB8E99731->).

The former manages “brown” electronic equipment that include computers and televisions and the latter manages white WEEE that includes washing machines and refrigerators. Other smaller PROs include the Swiss Light Recycling Foundation (SLRS) and Stakeholder Organization for Battery Disposal (INOBAT) and only manage lighting equipment and consumer batteries.

PROs (mainly SWICO and SENS) are also responsible for setting the advanced recycling fees (ARF), which are posted on their websites. Producers first pay the ARF on sold or imported appliances to the PROs, which is then passed down to distributors and retailers. They, in turn, charge consumers upon purchasing a new EEE. PROs have mandated distributors and retailers to explicitly mention the amount of the ARF in customer invoices. In this sense, the ARF pays for the entire system starting with collection, transportation to dismantling and recycling of used EEE. Consumers are obligated by the law to return discarded WEEE to retailers or to SENS/SWICO collection points at no cost. They can also transport them to the recyclers directly. As mentioned above, by paying the ARF on the purchase of new appliances, consumers bear part of the financial responsibility.

Manufacturers and importers are responsible for the financial and physical management of their products. In case of a PRO membership, companies can have PROs meet their EPR obligations on their behalf. Distributors and retailers share part of the physical responsibility, as they are obliged to take back used electronics and electric equipment, regardless of whether the products were sold by Them or whether or not the consumers purchase a new product as replacement. Finally, the federal government is responsible for setting the legal and regulatory framework for WEEE management, while cantonal authorities are entrusted with licensing recycler, thereby playing a critical control function. Authorized recyclers are obliged to enforce measures to ensure the safety and wellness of their employees and to adhere to emission standards.

Collective take-back systems in Bulgaria: The most recent WEEE national legislation in Bulgaria came in 2013 with the issuance of Decree 256/2013 adopting the Ordinance on Waste Electrical and Electronic Equipment, which is in line with the new EU WEEE Directive 2012/19/EC. The Bulgarian regulation is based on the principle of “producer responsibility” and consistent with the principle of “polluter pays”. Producers are therefore physically and financially responsible for the collection, transportation, reuse, recycling, recovery and disposal of WEEE. They can meet obligations individually upon obtaining the necessary authorization from the Ministry of Environment and Waters (MOEW), or through collective schemes that are licensed by MOEW to perform the collection and recycling obligations on their behalf. Alternatively, they can pay a “product fee” to the State Enterprise for the Management of Environmental Protection Activities if they fail to meet the targets on their own account or through collective schemes.

Ecobultech AD is the first collective take-back system in Bulgaria with a license from MOEW to meet the recycling obligations of WEEE producers in 142 cities across the country⁽²²⁾. WEEE producers and importers pay a fee for Ecobultech AD to implement an EPR-based e-waste management system throughout the recycling chain, starting with collection and ending with the environmentally sound and safe recycling and disposal. Ecobultech AD provides its members with certificates exempting them from paying the so-called “product fee” to the Bulgarian state. Other producer collective schemes, also known as “Recovery Organizations” include Eltechresource AD, NOORO, Green Tech and Teneco Recycling.

Producers are also mandated to apply eco-design requirements to facilitate the reuse and proper treatment of products at end-of-life, and inform household EEE consumers on how to separate the disposal of WEEE from municipal waste, the possible harmful human health and environmental effects pertaining to hazardous substances in WEEE, and the different take-back and collection systems in place. Retailers and distributors are equally obliged to inform consumers at the point of sale on possible take-back systems and collection points for consumers to return their used EEE.

(22) Ecobultech Website. Downloaded from (<http://www.ecobultech.com/?page=about>).

VII



*Perspectives on
EPR in Egypt*

In Egypt, the e-waste sector can be generally considered at its infancy stage. Although the government is starting to discuss e-waste as a policy goal, there is a need to take concrete steps to create a policy framework and legislations for e-waste recycling in addition to providing incentives to promote the creation of a formal ecosystem for e-waste.

Most players in the sector are informal entities that use environmentally harmful melting methods to extract precious material. There are no proper waste and end of life disposal operational cycles. A number of formal companies have been formed in recent years to work in e-waste collection, primary dismantling and exports of certain components. However, these companies face fierce price and economies of scale challenges posed by the informal sector and lack the support of the government through legislations and enforcement of regulations.⁽²³⁾

In the same light, in Egypt EPR as a concept remains to be considered a relatively new framework to be introduced and integrated in any proposed policy strategy and framework for electronic waste management and recycling. EPR implementation faces a compounded set of challenges that include:

- ▶ Need for understanding and recognition of EPR as a policy tool among officials and decision makers;
- ▶ Need for awareness among manufactures and business platforms of the importance of EPR and its definition;
- ▶ Need for an EPR framework that the government can embrace and enact;
- ▶ Need for a governmental champions that lobby for EPR;
- ▶ Unavailability of information on regional and international experience and practices that can inform decision makers; and
- ▶ The e-waste industry is dominated by informal players and lacks a recycling infrastructure.⁽²⁴⁾

A Current Status of Legislations on EPR

Before shedding light on EPR and relevant legislations, it is also as imperative to understand the existing legislative framework for e-waste in Egypt.

On a national level, there is no specific law that mandates e-waste management in Egypt. The environment law no 4, 1994 is the main legislative source for waste management in Egypt and it does not have a specific stipulations for e-waste. In fact, there seems to be no current attempts to draft an e-waste related law.⁽²⁵⁾

However, it mandates the treatment of hazardous materials. Companies working in the E-waste sector are obliged under the law to receive licenses to handle hazardous materials.⁽²⁶⁾

Internationally, Egypt has ratified the Basel convention in January 1993. The convention deals with the Control of Trans-boundary Movements of Hazardous Wastes and their disposal. As such, hazardous materials that are parts of the components of electronics are governed by the conventions and fall under its jurisdiction, thus categorizing e-waste as hazardous⁽²⁷⁾. Egypt's Telecommunication Law prohibits the importation of used phones, which can be considered as

(23) Expert Observation

(24) Current expert observation suggest that around 20% of market share of the E-waste sector is for the formal sector and the rest is dominated by the informal sector.

(25) Ibid

(26) Ibid

(27) E-waste is categorized as hazardous waste due to the presence of toxic materials such as mercury, lead and brominated flame retardants are considered as hazardous under the convention.

a restriction again on the importation of certain e-waste streams (mobiles in this case) into local market.⁽²⁸⁾ The Ministry of Environment has issued several decrees to further tackle the import and export of hazardous materials in general.⁽²⁹⁾ Additionally, in 2013 the Ministry of Trade and Industry had prohibited the imports of all used computers.

Naturally, when shifting focus to a more specialized topic like EPR, it is safe to say that there are institutional, legislative and regulatory voids in Egypt. Existing attempts at EPR schemes are often done on a voluntary basis by multinationals that have global EPR policies and are forced to try to implement it in the Egyptian context.

According to a legal brief on EPR in the field of electronics issued by CEDARE⁽³⁰⁾, there are no laws and regulations concerning EPR in Egypt.

By definition, EPR requires the producer to assume both financial and physical responsibilities of electronics they design, produce and sell. As such the producer under the Egyptian law in general has the following accountabilities and responsibilities⁽³¹⁾:

- ▶ Waste Related Responsibilities including disposal
- ▶ Responsibilities related to the Production, Supply and Importing Process
- ▶ Financial Responsibilities (paying fees etc.)
- ▶ Procedural Responsibilities

None of these responsibilities tackle or mention EPR or a related producer obligation regarding waste management.

For the vantage point of the law, waste management including collection and disposal are the main responsibility of government agencies.

B Policy and Institutional Efforts

The Ministry of Environment (MOE) and the Ministry of Communications and Information Technology (MCIT) are the two main ministries overseeing e-waste as a sector.

The MOE is leading national efforts on redirecting the country's policies and strategies towards shifting gears to a circular economy and embracing sustainable development. Part and parcel of these efforts is the promotion of cleaner production and consumption and the creation of a sustainable and integrated waste management system in Egypt based on reduction, reuse and recycling rather than just safe disposal. Under the auspices of the Ministry, the National Solid Waste Management Program (NSWMP) was launched with the goal of solving Egypt's escalating waste problem.⁽³²⁾

(28) Ibid

(29) Shakra, Hoda. «A Model for E-Waste Recycling System in Egypt». Nile University, 2016.

(30) Tarek EL Baz, Building Incentive Based Inclusive EPR System in Egypt: Mapping Electric and Electronic Equipment Take Back Chain. CEDARE, 2015.

(31) For a list of all the detailed laws and decrees for each of these responsibilities, please refer to the legal brief attached to the "Building Incentive Based Inclusive EPR System in Egypt: Mapping Electric and Electronic Equipment Take Back Chain" study by CEDARE, 2015.

(32) It is estimated that only about 60% of solid waste is being collected in Egypt. While governorates barely cover cost of collection by 50%. Meanwhile less than 15% of the collected waste is subject to recycling. The majority (more than 7580%-) of the collection activities of electronics are conducted by informal sector using door-to-door cycles, which proves very successful. As for electronics, Egypt is considered to be a huge market, this entails that Computer usage in Egypt has reached 43.9% of households and mobile phone subscriptions 115.6% of the population according to MCIT statistics in October 2013. As such e-waste is a significant contributor to Egypt waste collection and management problem.

The NSWMP in collaboration with the GIZ and the Environmental Compliance Office (ECO) of the Federation of Egyptian Industries (FEI) organized a workshop on “Sustainability in Solid Waste Management-Extended Producer Responsibility (EPR)”.⁽³³⁾ EPR was presented as a policy instrument that can support the facilitation of a waste management system, especially in electronics.⁽³⁴⁾ More than 80 participants representing government entities, packaging and electronic products companies, the recycling industry and civil society organizations attended the workshop.

The workshop aimed to introduce ministries and producers (packaging and electronics) to the concept of EPR. The workshop also sought to explore with the participants the potential for utilizing EPR schemes in the Egyptian context. The two-day workshop concluded with the recommendation to establish a steering committee to introduce the process of EPR development and to propose legislation needed in this regard.

Building on this effort and the recommendation of the workshop, the MOE in Egypt has initiated a consultative process with stakeholders to develop EPR related schemes for three waste streams; tires, packaging and waste electric and electronic equipment (WEEE). Towards this end, a steering committee has been established by a Ministerial Decree to head the consultation effort, which resulted in a draft document suggesting possible regulations and requirements to introduce EPR.

The NSWMP provided the required technical support and took the lead in facilitating this process in close cooperation with the Federation of Egyptian Industries. As for the MCIT, it has launched in 2010 the Green ICT initiative in cooperation with the MOE. The initiative stipulated the importance of safe disposal methods of E-waste, and marked the commencement of MCIT’s support to e-waste management practices and international partnerships in this regard.

As can be inferred from the above efforts, EPR in Egypt is in an introductory phase. These related efforts are to start raising awareness and create community dialogue to create a customized Egyptian framework for EPR. More efforts are expected even in the awareness phase. The consultation that was initiated by the MOE should be sustainable to ensure continuous level of lobbying for EPR on the policy level.

The Federation of Egyptian Industries can play a strong role to promote and design an EPR policy framework for electronics in Egypt. It can be the platform required to convince producers to adopt EPR, at least on a voluntary level, while at the same time it can encourage the government to promote EPR through incentives.

However, current existing EPR practices in Egypt are mainly voluntary and sometimes perceived within the context of corporate social responsibility. No collective EPR, i.e. with multi-stakeholders sharing, were found in Egypt.⁽³⁵⁾

C Case Studies of Voluntary Initiatives and Practices

In Egypt, practices related to the implementation of take back systems under the context of EPR are limited and could mainly be seen in the telecommunication sector. They primarily concentrate on collection efforts and attempts at recycling. From below case studies, the rate of success of these voluntary initiatives is of limited impact and is often partaken under corporate social responsibility rather than under EPR due to the absence of government acknowledgment of EPR and lack of regulations to enforce EPR as a standalone concept and

(33) The workshop took place on 8-9 April, 2014.

(34) Extended Producer Responsibility. National Solid Waste Management Programme, 2014. Workshop Report.

(35) Tarek EL Baz, Building Incentive Based Inclusive EPR System in Egypt: Mapping Electric and Electronic Equipment Take Back Chain. CEDARE, 2015.



as an integral part of an existing waste management system for e-waste. All below practices are voluntary initiatives:

Mobinil/Orange⁽³⁶⁾: Was one of the first companies to launch a pilot EPR-related scheme in 2003. This has paved the way to creating a repository of considerable experience in EPR. The company introduced several initiatives between 2003-2009 and continues to finetune and support sustainability plans with relevant partners. These initiatives are:

- **Mobile Batteries**: Waste mobile batteries collection and recycling with Egyptian Ministry of Environment and under Basel Convention guidelines. An MOU with Fonebak Group in England as a recycler was signed with the Ministry of Environment. A national advertisement campaign was launched representing a form of a take-back process. By 2007, the company collected 25,000 units, weighing average of 1.5 metric tons and exported it to FoneBak for recycling.⁽³⁷⁾
- **Refurbishing**: Mobinil's discarded IT equipment (such as PCs, laptops, and servers) are collected and given the priority of refurbishing. Items that passed the refurbishing and operation test were donated to schools and communities in need.
- **E-waste awareness programs**: In the governorates of Alexandria and Assuit, Mobinil initiated a dry cell and safe dumping project covering educational programs on dangers of e-waste and

(36) Shakra, Hoda. «A Model for E-Waste Recycling System in Egypt». Nile University, 2016. Tarek EL Baz, Building Incentive Based Inclusive EPR System in Egypt: Mapping Electric and Electronic Equipment Take Back Chain. CEDARE, 2015.

(37) Ibid



improper disposal targeting 62 schools in Alexandria and about 40 schools in Assuit. This took place in collaboration with the Governorate of Alexandria in 2009 and 2010, and is ready for possible scaling.⁽³⁸⁾

- *Internal end-of-life mobile collection and recycling initiative:* In 2012, the company launched an initiative to collect used mobiles by employees and partners and send them for recycling. A total of 1100 mobiles were collected. Two recyclers were outsourced: Recyclobekia and ITG.

- *E-waste Learning Center* with NGO Spirit of Youth in collaboration with CID consulting company to support mobile refurbishing and reuse efforts by youth in the area.

As can be observed, these are all initiatives that target one step or stage of an e-waste management cycle. It can be a seed to design a comprehensive take-back implementation scheme, but cannot be considered a fully operational EPR model when benchmarked to international practices.

Vodafone: in 2010, Vodafone started a pilot project of collecting handsets to be recycled. In a year, about 132,200 devices were collected.⁽³⁹⁾ Customers were offered an EGP 10 recharge card as an incentive for handing in of old phones in Vodafone retail stores and dealers. These handsets were shipped for recycling in the UK.⁽⁴⁰⁾ Due to incredible cost associated with exporting and recycling abroad the company stopped the operation but continued the collection process.

(38) Ibid

(39) Ibid

(40) Ibid

Nokia: Nokia, launched a take-back and recycling scheme in 2009 in the Middle East and Africa (about ten countries including Egypt). The scheme was launched through Nokia Care Points. Nokia partnered with Resala NGO in 2011 for collecting and recycling of mobile phones, batteries, chargers and other mobile accessories. However, the partnership failed to grow and scale up as there was no market awareness and limited availability of recycling infrastructure and companies specialized in e-waste recycling. Another challenge was the lack of awareness and understanding of end users and customers. The idea was also to leverage the network of volunteers from Resala to get people rethink what they do with mobiles, but activation level was not very high on the Resala side. All activities came to halt during the 25th of January revolution.⁽⁴¹⁾

Raya Holding: In 2009 Raya trade launched a take-back initiative in all its branches for used mobile phones, whereby Raya would buy the old phones of customers wishing to buy a new mobile phone, regardless of the used phone's condition, (i.e. working, broken, etc.). Most of the collected used mobiles were sent to Raya's maintenance centers⁽⁴²⁾ to be used as spare parts or sold through auction. Raya also raised its customers' awareness of the importance of recycling at its selling points.

D Lessons Learned

- ▶ EPR needs to become acknowledged as a policy tool for Egyptian decision makers;
- ▶ Existing efforts are on a voluntary basis, and fall under corporate social responsibility rather than being activated under EPR;
- ▶ Need for recycling facilities is largely due to a lack of capital investment and the crucial need to continuously have an un-interrupted stream of waste to operate these facilities;
- ▶ Need for integrated formal systems to collect waste and the existence of scattered informal collection activities along the downstream phase of the supply chain;
- ▶ These initiatives lack government support and awareness from the public;
- ▶ These initiatives also faced a lack of information and understanding of local recyclers and the existing e-waste infrastructure in Egypt. As can be observed selected products were sent abroad to be recycled, which was very expensive and lacked economic sustainability;
- ▶ There is a need to educate the private sector on the existing supply chain of e-waste in Egypt;
- ▶ Government officials and decision makers need capacity building regarding the significance of EPR as a policy tool; and
- ▶ Efforts undertaken so far by the MOE are commendable, however additional awareness, consultation and stakeholder dialogue is essential.

A report on the possibility of EPR in Egypt⁽⁴³⁾, has conducted a SWOT Analysis (Figure 2 below) that sheds further light on the existing opportunities for enabling EPR and possible related challenges:

(41) Ibid

(42) Raya Trade is the Nokia maintenance center in Egypt.

(43) Tarek EL Baz, Building Incentive Based Inclusive EPR System in Egypt: Mapping Electric and Electronic Equipment Take Back Chain. CEDARE, 2015.

1

EPR Existing Initiatives

2

Strength

- ▶ Strong willingness from producers, suppliers, and distributor community;
- ▶ Very strong willingness from communities to adopt e-waste recycling programme/s;
- ▶ Inclusive delivery Mechanism through CSOs and NGOs available and ready to be integrated into the EPR system;
- ▶ Strong communication & information;
- ▶ Some Infrastructure investments are already in place (e.g. Spear Ink, Recyclobekia and ITG); and
- ▶ Enabled due diligence and outreach is doable.

Weakness

- ▶ Non inclusive approach along the downstream, i.e. community not engaged disposal, collection, and post-collection;
- ▶ Scattered and fragmented collection and take-back activities;
- ▶ Lack of integrated supply chain connection producers and business from up-stream with down-stream actors;
- ▶ Misuse of human skills/resources;
- ▶ Logistics and preparedness is not well conducted.
- ▶ Out-of-date awareness plans and communication; and
- ▶ Sustainability not realized: socially/ financially.

3

Opportunities

- ▶ Existing momentum to address waste challenges in Egypt;
- ▶ Use of ICTs to share knowledge and strengthen learning experiences;
- ▶ Synergy efforts developed to enhance e-waste entrepreneurship new projects;
- ▶ Utilizing Community Youth Leaders and job generation;
- ▶ Focusing on innovative and inclusive delivery mechanisms through youth entrepreneurs and enterprising capacity of local CSOs;
- ▶ Potential scaling of success stories achieved by producers so far; and
- ▶ Create Business development opportunities for neglected sectors.

4

Threats

- ▶ Lack of government endorsement and policy incentives;
- ▶ Lack of regulations;
- ▶ Incentive package for actors especially young and willing entrepreneurs looking for potential employment; and
- ▶ Challenging existing informal cluster of waste collectors.

VIII



Conclusions and Recommendations

A Implications of introducing EPR in Egypt

Introducing EPR can be perceived as a policy tool to encourage the creation of an integrated waste management system for the e-waste sector. Adopting it could also propel governmental efforts to promote formal versus informal hold of the e-waste sector.

Having a clear system for collection, segregation, dismantling and recycling would create the market demand for formal players, and with the right governmental support could push informal entities to start becoming formal and comply with regulations. With Egypt's economic hardships, shifting responsibility to producers will unburden government agencies from fully financing the costs of end of life disposal. It will also promote public - private partnerships.

B EPR Instruments/Models suitable for Egypt

The nature of EPR entails that a one-size-fits-all approach cannot be adopted. Rather country specific considerations are vital to the design of related policies and schemes. Benchmarking international experiences is important; however replicating these models is not feasible.

To fully come up with an EPR policy framework in Egypt, this will require a participatory consultation process that include:

- ▶ Business associations and platforms such as the Federation of Egyptian Industries, and chambers of commerce, etc.
- ▶ Private sector, retailers and vendors
- ▶ NGOs and civil society
- ▶ Line ministries and government agencies

Additionally the framework to be discussed should tackle:

- ▶ Regulations
- ▶ Policy incentives
- ▶ Private sector engagement
- ▶ Access to local recycling infrastructure
- ▶ Access to information
- ▶ Viable pilot EPR models
- ▶ Financial incentives

C Roadmap and Concluding Remarks

These short and medium term suggestions are based on the need to build on consultation and stakeholder dialogue that several ministries and stakeholders have already initiated.

Main Recommendation and First Stage: Creating A Dialogue

- A participatory approach is essential to come up with the necessary consensus and lobbying to design an EPR policy framework for Egypt;
- Continuing a stakeholder dialogue spearheaded by the government is an essential first stage to recommend;

Access to Information and Creating Awareness

- Supporting existing private sector initiatives through providing them with information about local recyclers and available local options for re-use and refurbishing;
- Providing studies on the benefits and different models of EPR in addition to highlighting international practices;

Championing and Partnerships

- Assigning a ministry to champion policies and incentives needed to introduce EPR;
- Promoting the concept of EPR to the private sector and industry producers;
- Utilizing business associations, chambers, and other quasi-governmental platforms such as FEI to create public private partnerships to implement EPR related schemes using the power of collective partnerships;
- Promoting the idea of local collection platforms /hubs that play the role of PROs, and that could serve a whole sector rather than specific product brands;

Supporting Mechanisms

- Setting up a pilot project to implement a comprehensive take-back system that covers all stages (collection, segregation, reuse, recycling and final disposal) and provide financial support for it;
- Nurturing entrepreneurship and enterprise for youth to create e-waste formal business models for collection, refurbishing and recycling through incubation and acceleration programmes;
- Mapping and assessing the current players, supply chains and flows of e-waste in the local market;

Capacity Building

- Providing Study tours and trainings to decision makers;
- Need for Institutional capacity building for the institutions that will supervise the implementation of EPR and the institutions that will manage EPR schemes;

Policy Support

- Tracking and M&E are very important issues to be taken into consideration when designing implementation schemes for EPR. (How to quantify, value, and track the amount of products collected, reused and recycled and link it to its production source);
- Considering policy incentives such as mandatory recycled targets, recycling fees, minimum quotas for take-back products and mandatory re-used components, EPR labeling and certifications.



IX



References

- Alameer, Hassan. Assessment and Evaluation of Waste Electric and Electronics Disposal System in the Middle East. *European Scientific Journal Online*. 2014.
- Allam, Hossam. E-Waste Management in the Arab Region: Status and Opportunities. *EWasteGuide Online*. 2009.
- Agence Nationale de Gestion des Dechets (ANGeD), Tunisian Ministry of Agriculture and Environment Website.
- Boeni, Heinz. Uca Silva and Daniel Ott. E-Waste Recycling in Latin America: Overview, Challenges and Potential. *E-Waste Guide Online*. 2008.
- Bury, Duncan. Extended Producer Responsibility (EPR) in Canada. Environment Canada. Atlantic Canada Chapter of the Solid Waste Association of North America (SWANA) Online. 2008.
- CEDARE, Needs Assessment Of The E-Waste Sector In Egypt. *Sustainable Recycling Industries (SRI)*, 2011.
- CETESB – Environmental Agency of the State of Sao Paulo. Sustainable Management of Waste Electrical and Electronic Equipment (WEEE) in Latin America. *CETESB Website* (<http://www.cetesb.sp.gov.br>). 2016.
- Clean Production Action. How Producer Responsibility for Product Take-Back Can Promote Eco-Design. *Clean Production Action Website*. Downloaded from (http://www.cleanproduction.org/static/ee_images/uploads/resources/EPR_ecodesign_Apr08.pdf). 2007.
- CM Consulting. The WEEE Report – Waste Electrical and Electronic Equipment Reuse and Recycling in Canada 2013. *CM Consulting Website*. 2013.
- Carneiro, Beatriz Martins. Policy Update from Brazil. Brazil Ministry of Development, Industry and Foreign Trade. Downloaded from the United State Environmental Protection Agency Website (<http://www.epa.gov>). 2013.
- Dahroug, Said. BRRCR-Egypt and E-Waste Activities in the Arab Region. *CEDARE Online*. 2009.
- Deloitte. Guidance on Extended Producer Responsibility (EPR) – Analysis of EPR Schemes in the EU and Development of Guiding Principles for their Functioning. Downloaded from the Recycling Council of Ontario Website. (https://www.rco.on.ca/uploads/File/2015_EPR_Forum/RCO-Progressing_EPR_in_Ontario-Hestin_presentation.pdf). 2015.
- Ezeah, Chukwunonye, Jak A. Fazakerley and Clive L. Roberts. Emerging Trends in Informal Sector Recycling in Developing and Transition Countries. *Waste Management*. 2013.
- European Commission – DG Environment, Development of Guidance on Extended Producer Responsibility (EPR). 2014.
- EPR Canada. Getting EPR Oversight Right. *EPR Canada Online*. Downloaded from (<http://www.eprcanada.ca/EPR-Canada-Getting-EPR-Oversight-Right-March-2016.pdf>). 2016.
- El Baz, Tarek. Building Incentive Based Inclusive EPR System in Egypt: Mapping Electric and Electronic Equipment Take Back Chain. *CEDARE*, 2015.
- Edward-Ekpu Douglas Uwagba, Hazardous Waste Management and Challenges in Nigeria, Nasarawa State University – Nigeria. *Public Health International Online*, 2016.
- Electronic Waste Management in Brazil. *TechinBrazil Online*. 2014.

- E-Waste Roadmap for Latin America: WRF- SRI & RECPNet Workshop. Sustainable Recycling Industries Website. 2016.
- Eco Logic and the Institute for European Environmental Policy. A Report on the Implementaiotn of Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE). European Commission Online. Downloaded from (http://ec.europa.eu/environment/archives/waste/reporting/pdf/WEEE_Directive.ppd). 2009.
- Federation of Canadian Municipalities (FCM). E-Waste: A Success Story – The Next Frontier of Waste Management. FCM Website. Downloaded from (https://www.fcm.ca/Documents/presentations/2013/SCC2013/E_Waste_A_SuccesS_Story_EN.pdf). 2013.
- George Washington Journal of Energy and Environmental Law Online. E-Waste Regulation under the RCRA. 2011.
- GIZ, Extended Producer Responsibility (EPR): Opportunities and Challenges for Egypt and Developing Countries. 2014.
- GSMA Foundation. E-Waste in Latin America – The Contribution of Mobile Operators in Reducing Electronic Waste. GMSA Website. 2014.
- Hernandez S, Carlos A. WEEE Management Update from Colombia. SRI Cleaner Production Center in Colombia. Downloaded from the United State Environmental Protection Agency Website (<http://www.epa.gov>). 2013 and 2014.
- Hernandez S, Carlos A. E-Waste in Colombia: Current Status, Challenges and SRI Activities. SRI Cleaner Production Center in Colombia. Downloaded from the World Resources Forum Website (<http://wrforum.org>). 2015.
- Itoh, H. The Recent Trend of E-Waste Recycling and Rare Metal Recovery in Japan. Waste Management and the Environment. WIT Transactions on Ecology and the Environment, Vol 180. WIT Press Online. 2014.
- Japan Ministry of Environment. The State Play on Extended Producer Responsibility (EPR): Opportunities and Challenges. OECD Online. 2014.
- Japanese Ministry of Environment. Solid Waste Management and Recycling Technology of Japan – Toward a Sustainable Society. Japanese Ministry of Environment Online. Downloaded from (<https://www.env.go.jp/en/recycle/smcs/attach/swmrt.pdf>). 2012.
- Japan Industrial Waste Information Center. Industrial Waste Management and Waste Management Law. Japan Industrial Waste Information Center Online. Downloaded from: <http://www.jwnet.or.jp/en/contents/1Jananese%20WML.pdf>.
- Japanese Ministry of Environment. Japan Environment Quarterly. Volume 2. Japanese Ministry of Environment Online. 2013.
- Japan for Sustainability (JFS). New METI/MOE Policy Promotes Recycling of Small Electrical and Electronic Equipment Waste. JFS Online. 2013.
- Kheshen, Tawfik. «Economic Instruments for Sustainable Solid Waste Management: EPR». 2016. Presentation.
- Kunz, Nathan et al. Extended Producer Responsibility: Stakeholder Concerns and Future Developments. INSEAD. 2014.
- Khetriwal, Deepali Sinha, Philipp Kraeuchi and Rolf Widmer, “Producer Responsibility for

- E-Waste Management: Key Issues for Consideration – Learning from the Swiss Experience”. Journal of Environmental Management. 2007.
- Kyle, Barbara. Dell Introduces First Computer Made With Plastics from Recycled Electronics. Electronics Take-Back Coalition Website. Website (<http://www.electronicstakeback.com>). 2014.
 - Langwen, Benjamin. Solid Waste Management in Kenya – Opportunities and Challenges. National Environmental Management Authority (NEMA). Downloaded off globalmethane.org. 2012.
 - Lindqvist, Thomas. Extended Producer Responsibility In Cleaner Production: Policy Principle To Promote Environmental Improvements Of Product Systems. Lund University, 2000.
 - Linnell, Jason. Understanding and Complying with State Recycling Laws. Electronics Recycling Coordination Clearinghouse (ERCC). ECycleClearinghouse Online. 2011.
 - Ministry of Environment, GIZ and FEI, EPR Steering Committee قرار بشأن الإطار العام للمسؤولية الممتدة للمنتج في مصر- مسود، 2014.
 - Migliano, Joao Ernesto Brasil. Jacques Demajorovic and Lucia Helena Xavier. Shared Responsibility and Reverse Logistics Systems for E-Waste in Brazil. Journal of Operations and Supply Chain Management. Downloaded from (<http://bibliotecadigital.fgv.br>). 2014.
 - NSWMP, Extended Producer Responsibility Workshop Report, 2014.
 - NSWMP, 2014 , عرض تجارب بعض الدول في تطبيق مبدأ المسؤولية الممتدة للمنتج».
 - NSEAD Social Innovation Centre, Extended Producer Responsibility: Stakeholder Concerns and Future Developments. 2014.
 - OECD, Extended Producer Responsibility: A Guidance Manual for Governments, OECD Publishing, Paris, 2001.
 - Ogushi, Yasuhiko and Milind Kandlikar. Assessing Extended Producer Responsibility Laws in Japan. American Chemical Society Online. 2007.
 - Öztürk, Tuba. Generation and Management of Electrical-Electronic Waste (E-Waste) in Turkey. Journal of Material Cycles and Waste Management. 2015.
 - Panate, Manomaivibool. Extended Producer Responsibility in East Asia: Approaches and Lessons Learnt from the Management of Waste Electrical and Electronic Equipment. Lund University Online. 2008.
 - Peeranart Kiddee, Ravi Naidu and Ming H. Wong, “Electronic Waste Management Approaches: An Overview”, Waste Management Journal. 2013.
 - Popescu, Maria-Loredana, Sofia-Elena Colesca and Carmen Nadia Ciocoiu. Waste Electrical and Electronic Equipment Management in two EU Developing Countries: Romania and Bulgaria. University of Economics Prague Online. Downloaded from (https://msed.vse.cz/msed_2014/article/339-Popescu-Maria-Loredana-paper.pdf). 2014.
 - Qatari Ministry of Development Planning and Statistics, 2011-2016 Qatar National Development Strategy.
 - Shakra, Hoda. «A Model for E-Waste Recycling System in Egypt». Nile University, 2016.
 - Seitz, Joseph. Analysis of Existing E-Waste Practices in MENA Countries. SWEEP NET, 2016.

- Step Initiative, Guiding Principles to Develop E-Waste Management Systems and Legislation, 2016.
- Step Initiative, E-Waste Take-Back System Design and Policy Approaches, 2009.
- Step Initiative, E-Waste Prevention, Take-Back System Design and Policy Approaches, 2015.
- Sije, Antony and Pamela Awuor Ochieng, Cell Phone Disposal And Strategy Evaluation Of Elecotnrnic Waste Management in Kenya, A Case Of Mobile Phone Dealers In Kisumu County, Jomo Kenyatta University of Agriculture and Technology. European Journal of Business and Innovation Research Online. 2013.
- Swiss Association for Information, Communication and Organizational Technology (SWICO) Website < <http://www.swicorecycling.ch/en/about-us/>>.
- Sander, Knut et al. The Producer Responsibility Principle of the WEEE Directive. European Commission Website (http://ec.europa.eu/environment/waste/weee/pdf/final_rep_okopol.pdf). 2007.
- Schroeder&Schroeder. E-Waste Management in Canada. Schroeder&Schroeder Online. Downloaded from (<https://www.schroeder-inc.com/2016/03/19/e-waste-management-in-canada/>). 2016.
- Schroeder, Harold. Managing E-Waste in Canada Presents Many Challenges and Opportunities. Environmental Science & Engineering Magazin Online. 2012.
- Seguin, Jacinthe. Promoting Sustainable Materials Management Through Extended Producer Responsibility: Canadian Waste Electrical and Electronic Equipment (WEEE) Case Study. Environment Canada. Downloaded from the OECD Website. 2014.
- Tojo, Naoko. Extended Producer Responsibility As A Driver For Design Change - Utopia Or Reality? The International Institute for Industrial Environmental Economics, Lund University, 2004.
- Toffel, Michael W., Antoinette Stein and Katharine L. Lee. Extending Producer Responsibility: An Evaluation Framework for Product Take-Back Policies. Harvard Business School Online. 2008.
- Tsukada, Yasuhisa. Legislative System of Waste Management in Japan. Bureau of Environment. Tokyo Metropolitan Government. Downloaded from (http://www.asianhumannet.org/db/datas/Legislative_en.pdf).
- Takuma Technical Review. Volume 21. No 2. Downloaded from (<http://www.takuma.co.jp/english/gijutu/gihou/e-21-2.html>). 2013.
- UNEP, DITE. E-Waste Volume III: E Waste Take Back Systems, 2012.
- United States Environmental Protection Agency Website. Recourse Conservation and Recovery Act (RCRA) Overview.
- United Sates Department of Commerce. WEEE/RoHS Bulgaria. Downloaded from (<http://2016.export.gov/europeanunion/weerohs/weerohscountry-by-country/bulgaria/>). 2006.
- United States Environmental Protection Agency Website. California's Covered Electronic Waste Recycling System – A Closer Look. 2013
- United States Environmental Protection Agency Website. Broad Overview of E-Waste Management Policies in the U.S. 2013.

- United States Environmental Protection Agency Website. Electronics Stewardship in the United States of America. 2013.
- Working Party on Resource Productivity and Waste, Extended Producer Responsibility - Updated Guidance. OECD, 2016.
- Van Rossem, Chris, Naoko Tojo, and Thomas Lindhqvist. Extended Producer Responsibility An Examination Of Its Impact On Innovation And Greening Products. Greenpeace International, Friends of the Earth and the European Environmental Bureau (EEB), 2006.
- VanderPol, Michael. Overview of E-Waste Management in Canada. Environment Canada. Downloaded from the United States Environmental Protection Agency Website (https://www.epa.gov/sites/production/files/2014-08/documents/canada_country_presentation.pdf). 2014.
- Watkins, Emma et al. Development of Guidance on Extended Producer Responsibility (EPR). European Commission Website. Downloaded from (http://ec.europa.eu/environment/waste/pdf/final_report_10042012.pdf). 2014.
- Yolin, Christine. Waste management and Recycling in Japan – Opportunities for European Companies (SMEs focus). EU-Japan Center for Industrial Cooperation. 2015.
- Yagai, Yuzo. Recycling Scheme of a WEEE in Japan. Japanese Ministry of Environment Online. 2015.

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