

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT FRAMEWORK LEGISLATION AND MANAGEMENT SYSTEM IN EUROPE

Maria-Loredana NICOLESCU*

Abstract

Waste electrical and electronic equipment (WEEE) has become one of the most significant waste streams due to the increasing amounts and environmental impact. It is very important to know how to manage the WEEE quantities, what laws are in force in this field and what policies are available to apply.

This paper presents the e-waste legislation and management system from some of the European countries, as examples. The hierarchy of the management systems is presented according to the framework Directive and legislative approaches. There are also shown the "take-back" policy, the "polluter pays" principle and the "extended producer responsibility" principle. The goal of this research is to highlight the WEEE framework legislation in Europe and to present the EU policies for the WEEE management system.

Keywords: waste electrical and electronic equipment, legislation, the "polluter pays" principle, take-back policy, the principle of extended producer responsibility.

1. Introduction

WEEE management is an important issue, taking into account the increase of WEEE quantity from the last years, the opportunities for recovery of materials from recycling and not least the harmful effects on the environment and human health. Due to the various hazardous substances contained in waste electrical and electronic equipment, the risk on human health and environment increases if WEEE treatment is not done properly. The restrictions regarding the use of certain hazardous substances in electrical and electronic equipment are covered by the European Directive 2002/95/EC (RoHS Directive) recast as the 2011/65/EU Directive. The Directive 2002/96/EC was replaced by Directive 2012/19/EU, signed on 4th of July, 2012, in Strasbourg, which introduced higher WEEE collection targets. The new Directive was not fully transposed into the national legislation of each EU Member State, so the collection rate remains 4 kg/inhabitant/year as envisaged in the old Directive.

The Directive 2012/19/EU defines electrical and electronic equipment or "EEE" as "equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields and designed for use with a voltage rating not exceeding 1000 volts for alternating current and 1500 volts for direct current".

The categories of electrical and electronic waste, covered by 2012/19/EU Directive, are showed in table 1:

Table 1. Categories of electrical and electronic equipment (EEE)

Category 1	Large household appliances
Category 2	Small household appliances
Category 3	IT and telecommunications equipment
Category 4	Consumer equipment and photovoltaic panels
Category 5	Lighting equipment
Category 6	Electrical and electronic tools (with the exception of large-scale stationary industrial tools).
Category 7	Toys, leisure and sports equipment
Category 8	Medical devices (with the exception of all implanted and infected products)
Category 9	Monitoring and control instruments
Category 10	Automatic dispensers

Source: 2012/19/EU Directive, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:197:0038:0071:en:PDF>

Waste electrical and electronic equipment (WEEE) is a waste type consisting of any electrical or

*Graduate Teaching Assistant, PhD Candidate, Faculty of Law, "Nicolae Titulescu" University of Bucharest (e-mail: maria.loredana_nicolescu@yahoo.com).

electronic device, broken or abandoned.¹ According to OECD, *electronic waste*, also known as *e-waste* is "any device that uses a power source, that has reached end of life". Managing waste electrical and electronic equipment needs a specialized collection, transport, treatment and final disposal system.²

2. Legislation and WEEE management system in Europe

In the last two decades, the number of environmental policies and legislation underwent substantial changes regarding the environment and its protection. One of the important points taking into consideration is related to the product, in order to reduce its environmental impact resulting from the use throughout its entire life cycle - from design, production, consumption, up to the end of life.³ These policies and laws are almost all based on the principle of extended producer responsibility (EPR). EPR concept has become a principle of environmental policy established in many countries. EPR is a method of integrating the principles of sustainable development in international trade, based on international environmental law, a principle known as "Polluter Pays Principle".⁴

In Europe there is a framework directive in the field of waste, Directive 2008/98/EC which introduced the "polluter pays" principle, this being a guiding principle at European and international level. In this directive has been introduced the extended producer responsibility, representing "one of the means to support the design and production of goods which take into full account and facilitate the efficient use of resources throughout their life cycle, including their repair, reuse, disassembly and recycling without compromising the free movement of goods in the internal market". Directive 2008/98/EC established the concepts and definitions of waste management, recycling and recovery being basic elements. This explains the stage where waste ceases to be waste and become secondary raw materials, the so called criterion of end-of-waste. The Directive lays down some basic principles in waste management: it is assumed that the waste is managed without endangering human health or harming the environment

and in particular without risk to water, air, soil, plants or animals, without causing a nuisance through noise or odors, and without adversely affecting the countryside or places of special interest. The legislation and the policy of the EU Member States apply the following hierarchy of waste management in represented in Figure 1⁵:



Source:

<http://ec.europa.eu/environment/waste/framework/index.htm>

According to the EU strategy, the waste management systems hierarchy is based on minimization, reuse, recycling, recovery and, in the second stage, on the elimination.⁶

Traditionally, in the EU and elsewhere, a legislative approach on environmental issues was one of "command and control", and at this stage the emphasis is on extended producer responsibility, those who produce the goods being responsible for environmental impact throughout the entire life cycle, by recycling, reuse and disposal.⁷ The policy instruments of the extended producer responsibility include various types of taxes such as advance recycling fee, delivering the product at the end of its life cycle for recycling ("take-back policy"), raw material costs and combinations of these instruments. Other policies include "pay-as-you-throw", waste

¹ Wang, Feng (2008). Economic conditions for developing large scale WEEE recycling infrastructure based on manual dismantling in China, Delft University of Technology, Diploma Thesis for Master Programme of Industrial Ecology.

² UNEP (2007). E-waste - Volume II: E-waste Management Manual. United Nations Environment Programme, accessed June, 26, 2014, http://www.unep.or.jp/ietc/Publications/spc/EWasteManual_Vol2.pdf.

³ Nnorom I.C., Osibanjo O., "Overview of electronic waste (e-waste) management practices and legislations, and their poor applications in the developing countries", *Resources, Conservation and Recycling* 52 (2008): 843–858.

⁴ Kibert N.C., "Extended producer responsibility: a tool for achieving sustainable development", *J Land Use Environ Law*, 19 (2004): 503–23, http://www.law.fsu.edu/journals/landuse/vol19_2/kibert.pdf.

⁵ European Commission Environment, Directive 2008/98/EC on waste (Waste Framework Directive), accessed May, 5, 2014, <http://ec.europa.eu/environment/waste/framework/index.htm>.

⁶ Waste management plan in Bucharest, accessed April, 25, 2014, http://www.pmb.ro/servicii/gestionare_deseuri/docs/Plan%20Gestionare%20deseuri.pdf.

⁷ Bailey I., "European environmental taxes and charges: economic theory and policy practice", *Applied geography*, Elsevier 22 (2002): 235–51.

Darby L., Obara L., "Household recycling behaviour and attitudes towards the disposal of small electrical and electronic equipment", *Resources, Conservation and Recycling* 44 (2005): 17–35.

collection taxes and a ban on waste storages.⁸ Holland was the first country in Europe which adopted and fully implemented the take-back policy. The Dutch approach involves a scheme of allocating the cost. It is based on the national system of collection points and has units with the purpose of dismantling equipment at their end of life.⁹

More and more countries in Europe are implementing "take-back" laws which require the manufacturer to take the used products at the end of their life.¹⁰ Currently, the attention is focused on so-called "brown goods" (computers, mobile phones, etc.), but also on "white goods" (refrigerators, air conditioners, etc.), cars and batteries that require handling and special treatment.¹¹

"Extended Producer Responsibility" - EPR is an indirect legislative policy of the European Commission designed to protect the environment through the WEEE management.¹² The Organization for Economic Cooperation and Development (OECD)¹³ has defined EPR as "an environmental policy approach in which a producer's responsibility is extended to the post-consumer stage of the product life cycle, including the final step of eliminating them". EPR was also defined by Lindhqvist¹⁴ as "... a matter of policy to promote a product's improvements through its full lifecycle through extending the product manufacturer's responsibilities regarding different parts of the product's life cycle, and especially at the return of the equipment, the recovery and final disposal of the product".¹⁵ Due to environmental concerns, the legislation on extended producer responsibility includes reference to the entire supply

chain, with manufacturers, importers and retailers, being responsible for the collection and recovery of end-of-life (EOL) products.¹⁶ The main aims of extended producer responsibility are¹⁷:

- the prevention of waste generation and their reduction
- the reuse of products (equipment)
- the increased use of recycled materials in production
- the reduction of the consumption of natural resources
- the inclusion of the environmental costs in product prices
- the recovery of the energy when incineration is considered appropriate.

EPR was first established in Germany in 1991 by the passage inserted in the "Ordinance on the avoidance of packaging waste".¹⁸ EPR aimed at motivating producers on environmental issues of "design" as much as possible at the source, the design of the product to reduce the cost of waste management. An example is to design a product that is energetically efficient during use, that generates less waste and is less dangerous, and especially at the end of its life there are facilitated the recovery, reuse and recycling.¹⁹ In EPR, equipment manufacturers can outsource recycling and the global deficit is charged to the consumer when buying a new product.²⁰ EPR policy is based on the "polluter pays" and it is characterized by shifting responsibility away from municipalities, including the treatment and disposal costs in the product price and taking into consideration the environmental impact.²¹

⁸ Nnorom I.C., Osibanjo O., "Overview of electronic waste (e-waste) management practices and legislations, and their poor applications in the developing countries", *Resources, Conservation and Recycling* 52 (2008): 843–858.

⁹ Gutowski T., Murphy C., Allen D., Bauer D., Brass B., Piwonka T., Sheng P., Sutherland J., Thurston D., Wolf E., "Environmentally benign manufacturing: observations from Japan, Europe and the United States", *J Cleaner Prod* 13 (2005): 1–17.

¹⁰ Nnorom I.C., Osibanjo O., "Overview of electronic waste (e-waste) management practices and legislations, and their poor applications in the developing countries", *Resources, Conservation and Recycling* 52 (2008): 843–858.

¹¹ Langrova V., "Comparative analysis of EPR programmes for small consumer batteries: case study of the Netherlands, Switzerland and Sweden", *IIIEE Report 2002:9*, The International Institute for Industrial Environmental Economics, IIIEE, Lund University; 2002.

Widmer R., Oswald-Krapf H., Sinha-Khetriwal D., Schnellmann M., Boeni H., „Global perspectives on e-waste“, *Environmental Impact Assessment Review* 25 (2005): 436-458.

¹² Hume A., Grimes S., Jackson T., Boyce J., "Implementing producer responsibility: managing end-of-life consumables in an IT-service industry." In: *Proceeding of the international symposium on electronics and the environment IEEE* (2002): 144–9.

¹³ OECD, "Extended producer responsibility: a guidance manual for governments", Paris: OECD (2001).

¹⁴ Lindhqvist T., "Extended producer responsibility in cleaner production", *IIIEE Dissertation*, 2000:2, Lund, Sweden, The International Institute for Industrial Environmental Economics, IIIEE, Lund University.

¹⁵ Lindhqvist T., "Extended producer responsibility in cleaner production", *IIIEE Dissertation*, 2000:2, Lund, Sweden, The International Institute for Industrial Environmental Economics, IIIEE, Lund University.

Van Rossem C., Tojo N., Lindhqvist T., "Extended producer responsibility: an examination of its impact on innovation and greening products", *The IIIEE Report* commissioned by Greenpeace International, Friends of the Earth Europe, and European Environmental Bureau, September 2006.

¹⁶ Krikke H.R., Le Blanc H.M., Van de Velde S., "Creating value from returns: the impact of product life cycle management on circular supply chains—and reverse", *Center Applied Research Working Paper*, 2003-02, January 2003.

¹⁷ Langrova V., "Comparative analysis of EPR programmes for small consumer batteries: case study of the Netherlands, Switzerland and Sweden", *IIIEE Report 2002:9*, The International Institute for Industrial Environmental Economics, IIIEE, Lund University; 2002.

¹⁸ Kibert N.C., "Extended producer responsibility: a tool for achieving sustainable development", *J Land Use Environ Law*, 19 (2004): 503–23, http://www.law.fsu.edu/journals/landuse/vol19_2/kibert.pdf.

¹⁹ Maxwell D., "Products and the environment – extended producer responsibility for manufacturers", *Environ Energy Manag* September/October (2001):11–5.

²⁰ Krikke H.R., Le Blanc H.M., Van de Velde S., "Creating value from returns: the impact of product life cycle management on circular supply chains—and reverse", *Center Applied Research Working Paper*, 2003-02, January 2003.

²¹ Widmer R., Oswald-Krapf H., Sinha-Khetriwal D., Schnellmann M., Boeni H., „Global perspectives on e-waste“, *Environmental Impact Assessment Review* 25 (2005): 436-458.

In Finland, it was developed an awareness project "AWARE-NESS" (WEEE Advanced Recovery and Recycling Management System), project launched in the summer of 2003, which was focused on the WEEE Directive's influences on producers. The aim was to assist companies to establish a consensus on the details of implementation of the WEEE Directive. In addition, the project aims to initiate cooperation between companies regarding different product categories and choose the optimal recycling processes of obsolete products. Awareness project comprises two sub-projects named SELMA and ReclSys. Selma focused on management issues regarding operational recycling and developed communication activities between national authorities and companies. The main objective of ReclSys was to develop an online information system. Through this information system is possible the control of recycling processes, the reporting towards the authorities, the customer information regarding the entire recycling industry. In the Finnish system, institutions may contact the participating companies in the business of WEEE recovery to remove and retrieve equipment from the designated reception places. Most electronics retailers also take back the old equipment in association with buying a new one. The regional waste management companies also receive electronic waste. Most of the times, there is a fee paid to lift the waste and it varies between 1-36 euros depending on the category of the equipment. Yla-Mella et al.²² evaluated the take-back and the recycling of WEEE system in Finland and they noticed that there are more business operators involved in the recovery of WEEE, but only a few of them deal with collected elements for recovery. The WEEE are normally collected and pre-treated by some operators before there are being

transported elsewhere for treatment and effective use of materials.

Legislation on e-waste management was introduced into Switzerland in 1998 when the Ordinance on "The Return, the Taking Back and the Disposal of Electrical and Electronic Appliances" (ORDEA) came into force.²³ Switzerland has two separate WEEE recycling systems operated by two Producer Responsibility Organizations: the SWICO (The Swiss Association for Information, Communication and Organizational Technology) Recycling Guarantee and the S.EN.S (Stiftung Entsorgung Schweiz) System. SWICO manages "brown goods" namely electronic equipment such as computers, TVs, radio and others, while S.EN.S handles "white goods" such as washing machines, refrigerators, ovens, etc.²⁴ The SWICO Recycling Guarantee was created in 1993 by the SWICO Association of manufacturers and importers of office electronics and IT equipment in Switzerland. In 1994, when SWICO came into force, only electronic and IT equipment were covered. In the next years, were included further categories such as mobile telephone, equipment used in the graphics industry, telephones and telephone switchboard systems, consumer electronics, as well as dental equipment.²⁵ SWICO is a nonprofit company organized by industry with over 400 member companies.²⁶ Participation was originally voluntary, but it was mandated by a national ordinance in 1998.²⁷ In the Swiss system, the producers have full responsibility of the implementation and operation, covering the entire spectrum of WEEE, and the entire system is financed through recycling fees²⁸. The retailers, the manufacturers and the importers must take-back their equipment free of charge and manage it in "an environmentally tolerable way".²⁹ Until January 2002, consumers had to pay a fee to voluntary

²² Yla-Mella Y., Pongracz E., Keiski R.L., "Recovery of waste electrical and electronic Equipment (WEEE) in Finland", Proceedings of the waste minimization and resource use optimization conference, June 10, 2004, Oulu, Finland (2004):83-92, <http://www oulu.fi/resopt/wasmin/ylamella.pdf>.

²³ Fishbein, BK., "End-of-life management of electronics abroad" In: Waste in the wirelessworld: the challenge of cell phones. NewYork: INFORM Inc (2002) accessed February 22, 2014, <http://www.informinc.org>.

Sinha-Khetriwal D., Kraeuchi P., Schwaninger M., "A comparison of electronic waste recycling in Switzerland and in India", Environ Impact Assess Rev 25 (2005): 492-504.

Thompson Oh. S., "Do sustainable computers result from design for environment and extended producer responsibility? : analyzing e-waste programs in Europe and Canada", 'Waste Site Stories' ISWA/DAKOFA Annual Congress, October 2006, [http://www.iswa2006.org/PDF/Pressroom/HS_Executive_Summaries_\(all\)_final_060912.pdf](http://www.iswa2006.org/PDF/Pressroom/HS_Executive_Summaries_(all)_final_060912.pdf).

Widmer R., Oswald-Krapf H., Sinha-Khetriwal D., Schnellmann M., Boeni H., „Global perspectives on e-waste“, Environmental Impact Assessment Review 25 (2005): 436-458.

²⁴ Sinha-Khetriwal D., Kraeuchi P., Schwaninger M., "A comparison of electronic waste recycling in Switzerland and in India", Environ Impact Assess Rev 25 (2005): 492-504.

²⁵ Hischer R., Wager P., Gauglhofer J., "Does WEEE recycling make sense from an environmental perspective? The environmental impacts of the Swiss takeback and recycling systems for waste electrical and electronic equipment (WEEE)", Environ Impact Assess Rev 25 (2005):525-39.

Widmer R., Oswald-Krapf H., Sinha-Khetriwal D., Schnellmann M., Boeni H., „Global perspectives on e-waste“, Environmental Impact Assessment Review 25 (2005): 436-458.

²⁶ Nnorom I.C., Osibanjo O., "Overview of electronic waste (e-waste) management practices and legislations, and their poor applications in the developing countries", Resources, Conservation and Recycling 52 (2008): 843-858.

²⁷ Fishbein, BK., "End-of-life management of electronics abroad" In: Waste in the wirelessworld: the challenge of cell phones. NewYork: INFORM Inc (2002) accessed February 22, 2014, <http://www.informinc.org>.

²⁸ Widmer R., Oswald-Krapf H., Sinha-Khetriwal D., Schnellmann M., Boeni H., „Global perspectives on e-waste“, Environmental Impact Assessment Review 25 (2005): 436-458.

²⁹ Fishbein, BK., "End-of-life management of electronics abroad" In: Waste in the wirelessworld: the challenge of cell phones. NewYork: INFORM Inc (2002) accessed February 22, 2014, <http://www.informinc.org>.

recycle of their electronics through the SWICO system. Since 2002, the consumers were able to return their "end of life" electronics free of charge as the free system came into force.³⁰ Swiss Foundation for Waste Management (S.EN.S) was established in 1990 as a non-profit organization that operates with recover solutions from manufacturers, importers and retailers, having as initial work field the recycling of refrigerators and freezers. Today, S.EN.S is responsible for household appliances, construction, gardening, electrical and electronic toys, lighting equipment and so on. SWICO and S.EN.S established the take-back policy and the recycling system financed by advanced recycling fees (ARF), the fee being paid by the consumer when he buys the electrical and electronic equipment (EEE). They both created a regulation that outlines the prerequisites for the recycling companies to be commissioned for either of the systems. In 2002, the overall recovery of IT equipment was estimated at 60–70% in Switzerland³¹. By the effort of these systems, about 75,000 tonnes of electrical and electronic devices were collected, sorted and dismantled and subsequently treated in Switzerland in 2004³² while about 68,000 tonnes were collected in 2003³³. Sinha- Khetriwal et al. (2005) observed that Switzerland was the first country in the world that established a formal system to manage e-waste.

In several European countries, the laws of the waste electrical and electronic equipment are differentiated by the responsibility belonging to the manufacturer/importer or local governments as the Khetriwal Deepali Sinha, Philipp Kraeuchi and Rolf Widmer presented in their paper "Producer Responsibility for e-waste management: Key Issues for Consideration e Learning from the Swiss experience ", Journal of Environmental management xx, 2007: 1-13³⁴:

- In Switzerland came into force in July 1998, the "Ordinance on the return, take back and disposal of electrical and electronic equipment," the manufacturer/importer being responsible;

- In Denmark, since December 1999, it was imposed the "Statutory Order from the Ministry of Environment and Energy no. 1067" with the responsibility of local government;

- Netherlands must comply since January 1999 the disposal under the "White and brown Decree", the responsibility belonging to the manufacturer/importer

- Norway has signed since July 1999, the "Regulation of electrical and electronic discarded products", the manufacturer/importer being responsible for WEEE management;

- Belgium signed in March 2001 the "Environmental policy agreements on obligations to waste electrical and electronic equipment take-back. In this case the manufacturer/importer is responsible for the management of WEEE;

- In Sweden is in force since July 2002, the responsibility of manufacturer by Ordinance of electrical and electronic products (SFS 2000:208);

- Germany follows since March 2005 "The law governing the sale, the return and the environmental-friendly disposal of electrical and electronic equipment (Law ElektroG)" with the responsibility of the manufacturer/importer.

European legislation on waste electrical and electronic equipment (WEEE) refers to³⁵:

- Directive 2012/19/EU of the European Parliament and of the Council of 04 July 2012 on waste electrical and electronic equipment (WEEE);

- Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE). Consolidated version;

- Directive 2003/108/EC of the European Parliament and of the Council of 8 December 2003 amending Directive 2002/96/EC on waste electrical and electronic equipment (WEEE);

- Directive 2008/34/EC of the European Parliament and of the Council of 11 March 2008 amending Directive 2002/96/EC on waste electrical and electronic equipment (WEEE).

Secondary legislation on WEEE refers to: (http://ec.europa.eu/environment/waste/weee/legis_en.htm):

- Commission Decision 2004/249/EC of 11 March 2004 concerning a questionnaire for Member States reports on the implementation of Directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE);

- Commission Decision 2005/369/EC of 3 May 2005 laying down rules for monitoring compliance of Member States and establishing data formats for the purposes of Directive 2002/96/EC of the European Parliament and of the Council on waste electrical and

³⁰ Raymond M., "Getting your product back: coping with the challenge of global electronics", Proceeding of the international symposium on electronics and the environment IEEE, (2002): 89–92.

³¹ Raymond M., "Getting your product back: coping with the challenge of global electronics", Proceeding of the international symposium on electronics and the environment IEEE, (2002): 89–92.

³² Hischier R., Wager P., Gaughhofer J., "Does WEEE recycling make sense from an environmental perspective? The environmental impacts of the Swiss takeback and recycling systems for waste electrical and electronic equipment (WEEE)", Environ Impact Assess Rev 25 (2005):525–39.

³³ Sinha-Khetriwal D., Kraeuchi P., Schwaninger M., "A comparison of electronic waste recycling in Switzerland and in India", Environ Impact Assess Rev 25 (2005): 492–504.

³⁴ Sinha Khetriwal D., Kraeuchi P., Widmer R., "Producer responsibility for e-waste management: Key issues for consideration-Learning from the Swiss experience", Journal of Environmental Management xx (2007): 1-13.

³⁵ European Commission, Environment, Waste electrical and electronic equipment (WEEE), accessed March 15, 2014, http://ec.europa.eu/environment/waste/weee/legis_en.htm.

electronic equipment (notified under document number C(2005) 1355);

- Council Decision 2004/312/EC and Council Decision 2004/486/EC, as well as acts related to the accession of new Member States, provide for some derogations, limited in time, as concerns the targets set by Directive 2002/96/EC (WEEE).

Regarding various substances used at electrical and electronic equipments production, there is Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. On the other hand, WEEE recycling provides considerable opportunities regarding raw materials available on the market. EU legislation promotes the collection and recycling of WEEE in accordance with 2002/96/EC WEEE Directive. The legislation presumes the creation of some collection schemes where consumers give used equipment, without charge. The purpose of these systems is to increase recycling and reuse of such products. Currently, a third of EU WEEE compliance schemes is reported by the compliance systems such as they were separately collected and properly managed, the WEEE being³⁶:

1) collected by the unregistered businesses and treated properly

2) collected by the unregistered businesses and treated improperly or even illegally exported abroad

3) disposed as part of the residual waste (for example, in landfills or incinerators).

The European Commission has revised the WEEE Directive, in order to increase the amount of collected and treated WEEE, to reduce waste and to give to the Member States the tools to fight against illegal export of waste more effectively. Reforming the 2002/96/EC Directive ended with the signing of the new Directive, 2012/19/EU Directive, on 4th of July 2012 at Strasbourg, which introduces higher collection target of WEEE. Until the total transposition of this Directive into the national law of each Member State, the current collection rate of 4 kg/inhabitant remains in force, following that, at the middle of 2016, the minimum collection rate being 45%, calculated based on the total weight of WEEE collected in one year, expressed as a percentage of the average weight of EEE placed on the market in the three preceding years.³⁷ In the second stage of the Directive, starting from 2019, the minimum collection rate to be achieved is 65% of the annual average weight of EEE put on the market in the three previous years in each Member State or, alternatively, 85% of generated WEEE in the respective state territory.³⁸ Norway, Sweden, Denmark, along with Italy, Ireland, Belgium,

Luxembourg, Germany, Finland and Austria recorded the highest annual WEEE rate collection, over 8%, according to the European statistics (Eurostat)³⁹ sources, reporting for 2010, table 2.

Table 2. WEEE collection rate (kg per capita) in Europe (2010)

Country	2010
Norway	22,042
Sweden	17,215
Denmark	14,949
Italy	9,826
Ireland	9,743
Belgium	9,666
Luxembourg	9,514
Germany	9,502
Finland	9,484
Austria	8,879
Netherlands	7,711
United Kingdom	7,637
France	6,695
Bulgaria	6,092
Czech Republic	5,059
Iceland	4,996
Portugal	4,414
Slovenia	4,234
Estonia	4,228
Greece	4,172
Slovakia	4,065
Hungary	4,052
Malta	3,703
Spain	3,394
Cyprus	3,145
Poland	2,94
Lithuania	2,882
Latvia	2,044
Romania	1,296

Source:

<http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

For 2011, according to table 3, the highest annual collection rates are registered in Norway, Sweden and

³⁶ EU WEEE compliance schemes, accessed May, 5, 2014, http://epp.eurostat.ec.europa.eu/portal/page/portal/waste/key_waste_streams/waste_electrical_electronic_equipment_wEEE.

³⁷ Journal of the European Union, Directive 2012/19/EU of the European Parliament and of the council of 4 July 2012 on waste electrical and electronic equipment (WEEE), (recast), <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:197:0038:0071:en:PDF>, accessed on February, 25th, 2015.

³⁸ Ecotic Press, accessed March 15, 2014, www.ecotic.ro.

³⁹ European statistics, accessed February, 10, 2015, <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>.

Denmark. The last places are occupied by Latvia and Romania, considering the statistic reports for Eurostat.

Table 3. WEEE collection rate (kg per capita) in Europe (2011)

Country	2011
Norway	22,173
Sweden	18,687
Denmark	15,137
Belgium	10,408
Finland	9,745
Luxembourg	9,616
Italy	9,171
Austria	8,993
Germany	8,683
Ireland	8,658
United Kingdom	8,176
Netherlands	7,919
France	7,219
Bulgaria	5,504
Portugal	5,283
Czech Republic	5,282
Estonia	4,983
Slovenia	4,552
Slovakia	4,372
Liechtenstein	4,353
Croatia	4,09
Lithuania	3,908
Greece	3,808
Malta	3,757
Poland	3,72
Hungary	3,716
Spain	3,292
Latvia	2,263
Romania	1,043

Source:

<http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

A similar situation is found in table 4 which contains the reported WEEE collection rate for 2012. The same countries occupy the first three places and the last two places.

Table 4. WEEE collection rate (kg per capita) in Europe (2012)

Country	2012
Norway	20,903
Sweden	17,713
Denmark	13,628
Belgium	10,465
Finland	9,784
Luxembourg	9,435
Austria	9,182
Ireland	8,977
Germany	8,588
Italy	8,354
United Kingdom	7,906
Netherlands	7,382
France	7,191
Bulgaria	5,26
Czech Republic	5,108
Lithuania	4,772
Slovenia	4,584
Poland	4,549
Hungary	4,462
Slovakia	4,192
Estonia	4,132
Liechtenstein	3,812
Croatia	3,792
Portugal	3,786
Malta	3,59
Spain	3,378
Greece	3,357
Latvia	2,307
Romania	1,151

Source:

<http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

The current WEEE collection rate of 4 kg/capita/year from private households, as universal rate, does not reflect the economy of each individual Member State and therefore lead to sub-optimal targets for some countries and too ambitious for others.⁴⁰

For example, Romania, like other countries from Central and Eastern Europe, will benefit from a transition period, translated by creating, in the first stage between 2016-2019, a collection rate of 40- 45% and delaying the achievement of the collection rate of 65% (applicable in the EU starting with 2019) until a date decided by the every Member State, but not later than 2021.⁴¹

The 2012/19/EU Directive provides to the EU Member States the necessary tools to combat illegal waste export more effectively. The illegal WEEE shipments disguised in legal shipments of used equipment against the EU rules of waste treatment is a serious problem. The new Directive requires to the

⁴⁰ ST17367 Proposal for a directive of the European Parliament and the EU Council on waste electrical and electronic equipment (WEEE), Brussels, December 8th, 2008.

⁴¹ Ecotic, accessed March 15, 2014, www.ecotic.ro, <http://www.ecotic.ro/uploads/original/8d4b99097775110adebcd6b4c26f50d8934d3cb7.pdf>.

exporters to test and provide documents for such transfers. An improvement is the harmonization of national registration and reporting under the Directive. Member States registers for electrical and electronic equipment producers will be integrated more closely. Administrative burden is expected to be significantly reduced.⁴²

3. Conclusions

The changes in European legislation regarding waste electrical and electronic equipment have as goal the alignment of Member States national legislation in a common objective and also accelerate his

achievement. EU waste policy has evolved in the last 30 years passing through a series of action plans for environment and legislative framework that aims to reduce the negative environmental and health impact and create an efficient economy in terms of resources and energy.⁴³

There are still countries in Europe that are not complying the 4 kilograms/capita/year collection target. As the new Directive introduces higher targets, it should be taking into consideration the solutions for this problem, may be for a more efficient WEEE management.

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