State-of-the Art review on Waste Electrical & Electronic Equipment reuse in the framework of the LIFE REWEEE project

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Abstract The co-funded by the European Commission LIFE programme "Development and Demonstration of Waste Electrical & Electronic Equipment (WEEE) Prevention and Reuse Paradigms" (LIFE-REWEEE) started in January 2016, aiming at the reduction of WEEE through the implementation of reuse and preparing for reuse actions. In specific, it aims at the promotion and facilitation of the implementation of the relevant legislation, the reliable and socially sensitive preparation for reuse in Greece, and the development and implementation of models and assessment tools of EU-wide applicability.
This paper presents one of the preparatory, yet core deliverables of LIFE-REWEEE project, namely the "State-of-the-Art Review on the WEEE prevention and preparing for reuse", which consists an information tank for the Project's stakeholders. The "State-of-the-Art Review on the WEEE prevention and preparing for reuse" is considered crucial for the implementation of the rest of the Project actions. For the completion of the aforementioned study several tools, such as semi-structured interviews and questionnaires, web-based search for projects and best practices as well as a desk top study of official, scientific and grey literature were employed. The report covers the three main pillars for successful implementation of WEEE prevention and preparation for reuse: best initiatives and good practices; legislative facilitators and barriers; and available economic instruments.

Keywords: Keywords: WEEE reuse & preparing for reuse, State-of-the-Art

Introduction

The last two decades technological progress led to rapid design and production of novel electrical and electronic equipment. In parallel, the life span of these devices was shortened. These trends have resulted in intensive production of electric and electronic equipment (EEE) and consequently in the increased generation of their waste. Waste Electrical & Electronic Equipment (WEEE) is considered one of the fastest growing streams worldwide. In 2005 alone, the Member - States of European Union disposed 8.3 to 9.1 million tonnes of WEEE, while it is estimated that by 2020, this amount could be as high as 12.3 million tonnes, corresponding to an annual increase of 2.5% to 2.7%.Recent studies foresee that the annual increase rate of WEEE generation will be approximately 3 to 5% within the next decades.
The co-funded by the European Commission LIFE programme "Development and Demonstration of Waste Electrical & Electronic Equipment (WEEE) Prevention and Reuse Paradigms" (LIFE-REWEEE) started in January 2016, with ultimate aim to reduce WEEE through the implementation of prevention and preparation for reuse actions. More specifically, it aims to promote and facilitate the implementation of the relevant legislation, the reliable and socially sensitive preparation for reuse in Greece, and the development and implementation of models and assessment tools of EU-wide applicability.
This paper presents one of the preparatory, yet fundamental, deliverables of LIFE-REWEEE project, the "State-of-the-Art Review on the WEEE prevention and preparation for reuse", which develops an information tank for the Project's stakeholders, crucial for the implementation of the rest of the Project actions. For the aforementioned study several tools, such as semi-structured interviews and questionnaires, web-based search for projects and best practices and a desk top study of official, scientific and grey literature were employed.

Methodology

The report covers the three main pillars for successful implementation of WEEE prevention and preparation for reuse: best initiatives and good practices; legislative facilitators and barriers; and available economic instruments. These pillars are analytically presented in three parts as following:

I. Identification of initiatives and good practices in EU-28

II. Investigation of legislative facilitators and barriers, at national and EU level

III. Available economic instruments to promote WEEE reuse and preparation for reuse.

For the development of the report the following means were employed: interviews with stakeholders, scientific and grey literature search (scientific journals, reports, websites), questionnaires – survey, personal contacts.

Results and discussion

I. Identification of initiatives and good practices in EU-28

Twenty one (21) WEEE prevention and preparation for reuse activities (initiatives, best practices) that developed and implemented in 12 EU member states, up to June 2016 were identified investigated and assessed (Table 1). Depending on data availability, the activities have been evaluated upon environmental, economic and social criteria, such as their diversion potential, the reuse percentage, the difficulty of their implementation, their impact on the citizen's behaviour, and the number of jobs created. Most of them shared a common principle: the development of WEEE prevention or preparation for prevention activities with the aim to promote socio-economic solidarity and fight exclusion and marginalisation. The majority of the identified good practices involved the reuse or preparation for reuse of IT/ICT equipment and large household appliances. Three main obstacles for the implementation of WEEE preparation for reuse actions were highlighted: the "poor" collection systems, the restricted access to WEEE and the obsolescence (technological, style, planned). During the investigation of the aforementioned activities, it became obvious that Greece lags behind with regard to initiatives on preparation for reuse, indicating the necessity for the implementation of the LIFE REWEE project.

Table1: WEEE prevention and preparation for reuse activities (initiatives, best practices)

(W)EEE Categories	Practice	Country
IT / ICT	CF2D	Belgium
	Promise IT - Rehab	Ireland
	LIFE SUMANEWAG	Greece
	Perth WEEE Centre (UHI)	Scotland
	Ateliere fara frontiera	Romania
	CAMARA	Ireland
	Close the gap	Belgium
	Computer Aid	England
Medical equipment	LIFE MED	Italy
Large appliances and small IT & ICT	Re-Enchufa - AERESS	Spain
	R.U.S.Z - Reparatum und Service Zentrum	Austria
	Leeds	England
WEEE	Revisie – Komosie	Belgium

	Envie	France
	Repair truck- Envie	France
WEEE & other waste streams	Emmaus	France
	Repair Café – Recycle at Source	Greece
	Repair Café Foundation	Netherlands
	L'Alligatore	Italy
	FRN	England
Toys (with electrical/electronic parts)	R-CICLEJOGUINA (ECOJOGUINS	Spain

II. Investigation of legislative facilitators and barriers, at national and EU level

The second part of the State-of-the Art Report involved the investigation, evaluation and presentation of legislation facilitators and barriers at national and EU level. In order to analyse the current situation 48 interviews of key-persons in the sector of WEEE management were taken and a desk study was held. The analysis of collected data indicated four categories of barriers for the implementation of WEEE reuse or preparation for reuse actions: lack of legislation regarding the provision of access to adequate quantity of WEEE; insufficient regulation for the integration of the informal recycling sector; legislation about the improvement of Electrical & Electronic Equipment (EEE) design; and lack of economic motivation.

III. Available economic instruments to promote WEEE reuse and preparation for reuse

The investigation of economic instruments that have been applied to promote WEEE reuse and preparation for reuse highlighted the role of Extended Producer Responsibility (EPR) and Individual Responsibility. The implementation of EPR policies in the EU facilitates both data collection in a structured and relatively organised manner not only for WEEE recycling but also for preparation for reuse activities. Nevertheless, better exploitation of existing data and experiences is required for the development of more effective tools. The analysis of the available data indicated the following economic instruments of EPR systems that may contribute to more effective reuse and preparation for reuse activities: product taxes, input or materials levies, collection fees, disposal fees, deposit-refund schemes, subsidies, tax or subsidy combinations.

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