

THE LIFE REWEEE PROJECT - DEVELOPMENT AND DEMONSTRATION OF WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT PREVENTION AND REUSE PARADIGMS

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Abstract

Waste Electrical and Electronic equipment (WEEE) is considered one of the fastest growing waste streams worldwide. It is estimated that 44.7 million metric tonnes (Mt) of WEEE were generated worldwide in 2016 alone, of which only 20% was recycled through appropriate channels. In order to tackle the growing WEEE generation, policies providing robust guidelines on reuse (prevention) and preparing for reuse are considered a necessity. This paper presents the co-funded by the European Commission LIFE programme “LIFE-REWEEE” (full title: “Development and Demonstration of Waste Electrical & Electronic Equipment Prevention and Reuse Paradigms). The Project facilitates the development and demonstration of efficient sorting and preparing for reuse processes for a variety of WEEE, leading to the increase of acceptance of Used Electrical and Electronic Equipment (UEEE) by the consumer. The “LIFE-REWEEE” project will promote and facilitate the implementation of the relevant legislation, the reliable and socially sensitive preparing for reuse in Greece, and the development and implementation of models and assessment tools of EU-wide applicability, especially for those EU member-States that do not yet have well-established systems in place.

Keywords: WEEE reuse, preparing for reuse, sorting centers

Introduction

The increasing production and use of Electric and Electronic Equipment (EEE) has resulted in the generation of large quantities of Waste Electric and Electronic Equipment (WEEE) worldwide, with significant environmental impacts. Currently, WEEE is considered one of the fastest growing waste streams worldwide [1]. It is estimated that 44.7 million metric tonnes (Mt) of WEEE were generated worldwide in 2016 alone, of which only 20% was recycled through appropriate channels. Although approximately 66% of the world population is covered by national WEEE legislation, this does not necessarily come together with efficient enforcement [2].

The European Union is likely the world region where WEEE is most effectively regulated, but it also has one of the highest WEEE generation rates: about 17-20 kg per capita per year with an annual growth rate of 2.5-2.7%, and a large variation among countries [3]. The first WEEE Directive (2002/96/EC) required Member States to achieve a collection target of 4kg/inhabitant of household WEEE by 31 December 2006, independently of the WEEE quantity generated in the country [4]. The new WEEE Recast Directive (2012/19/EU) has adopted a collection target for each Member State (MS), from 2019 onwards, of 65% of the annual average of EEE put on market (PoM) over the three preceding years (65% PoM) or 85% of the annual average of WEEE generated (85% WG) [5]. Therefore, after an initial transition period (2016-2018, during which the target is set at 45% PoM), MS will be able to choose to have their targets set in terms of %POM or %WG.

Policies providing robust guidelines on reuse (prevention) and preparation for reuse, as well as on suitable regulatory framework are deemed a necessity. Legislation (Directive 2011/65/EC, Directive 2012/19/EC, Decision 1386/2013/EU) has identified WEEE as a priority waste stream due to the hazardous materials (e.g. heavy metals, Polychlorinated Biphenyls, Brominated Flame Retardants etc.) they might contain, and the significant effects they might have on both environment and human health. It is estimated that e-waste contains more than 1,000 different substances, many of which are characterised as toxic [6 -7]. On the other hand, WEEE are of great importance regarding the recovering or valuable resources, such as gold and copper). The recyclable material of WEEE contains 47% of ferrous metals, 22% of plastics, 6% of glass, and 4% of non-ferrous metals [8].

Against this background, the 3.5-year European project LIFE-REWEEE (full title: "Development and Demonstration of Waste Electrical & Electronic Equipment Prevention and Reuse Paradigms" LIFE14 ENV/GR/000858) was developed. The project aims at the reduction of WEEE through the implementation of prevention (reuse) and preparing for reuse actions and the development and demonstration of efficient sorting and preparation for reuse processes for a variety of WEEE, leading to the increase of acceptance of Used Electrical and Electronic Equipment (UEEE) by the consumer. It further promotes the implementation of the relevant legislation, the reliable and socially sensitive preparation for reuse in Greece, and the development of the implementation of models and assessment tools of EU-wide applicability, especially for those EU Member-States that do not yet have well-established systems in place.

Project description

The project is being implemented in Greece and Belgium with the co-financing of the European Commission through the LIFE+ Funding programme. Appliances Recycling S.A. is the project coordinator with partners the Hellenic Recycling Agency, the Green Fund, the Harokopio University, and the RREUSE.

The main objective of the LIFE-REWEEE project is the prevention/reduction of WEEE generation. In order to achieve this goal, the staff of the project reported what has been applied in other countries, and assessed the effectiveness of the relevant methods. Throughout the project implementation, two WEEE sorting centres in the wider areas of Attica and Thessaloniki regions are anticipated to be developed. The core activity of these centres will be the collection, the storage and the sorting of WEEE (Figure 1). In parallel, a Consultation Forum has been developed, including all relevant stakeholders in Greece, to promote and monitor WEEE prevention and preparing for reuse. The project also focuses on raising public awareness, and on the promotion and supporting of the WEEE prevention culture in Greece, through the design and the development of a web-based platform. The platform RE(W)EEE provides the ground for EEE donation or exchange. The platform will "target" households, NGOs, private and public bodies.

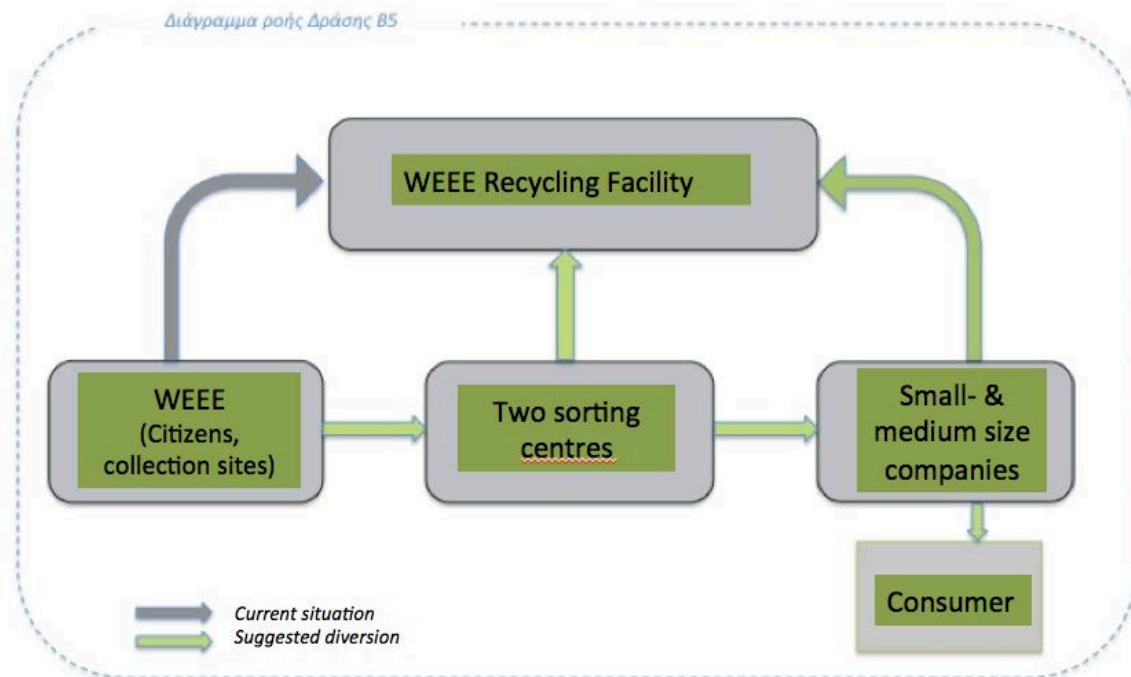


Figure 1. The current situation (grey path) versus the suggested diversion path (green).

The results, the deliverables, and the lessons learnt within the implementation of the project, will be extensively disseminated to all relevant European stakeholders. The means to be used include: The Project’s website, publications, During the project, printed and electronic brochures will be produced, containing information about the project actions, a series of guides regarding EEE repairing, social media networking, contacts with the media, participation in Conferences and submission of papers to Journal, and organisation of the project’s final workshop.

Expected results

The main expected results of the implementation of the LIFE –REWEEE project are as following:

- The development and operation of two (2) WEEE Sorting Centres, the first of their kind in Greece, in the wider areas of Attica and Thessaloniki regions, for the pilot operation of WEEE sorting and preparing for reuse.
- The development of an EU-wide applicable methodology and tools for the measurement of WEEE reuse and preparing for reuse.
- The accurate mapping of the baseline situation on WEEE reuse and preparing for reuse in Greece, which is currently mainly based on informal, small-scale private entrepreneurial initiatives.
- The development of a specifications set, protocols, technical requirements and guides, based on Best Available Techniques for the entire “preparing for reuse” cycle, to be adopted by the relevant regulatory body (Hellenic Recycling Agency), to facilitate permitting and assure quality of UEEE and prepare recommendations for policy measures, at all relevant levels (retailer management, Local Authority, national and EU legislation).
- The assessment of the level of WEEE reuse in Greece, before and after the project intervention, using the aforementioned tools.
- The definition of parameters to characterise the environmental, economic, and social impact of the process of preparing selected EEE streams for re-use, through the implementation of LCA methodologies and tools.
- The promotion of a multi-aspect WEEE prevention culture in Greece, based on modern social media and attractive activities.

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