A COUNTRY SPECIFIC ASSESSMENT OF EEE LIFESPAN DISTRIBUTION BASED ON A QUESTIONNARE-BASED STUDY

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Abstract
In the past two decades, several statistical models have been employed in order to calculate the amount of Electrical and Electronic Equipment (EEE) put on the market and the generated Waste Electrical and Electronic Equipment (WEEE). This lifespan distribution varies over space and time, as differences in purchasing power and consumption habits result in differences in the replacement time of the various EEE items. To date there is no reliable lifespan estimate of EEE categories in Greece, neither a robust prediction of their stock and WEEE generation rate. This preliminary study aims at the identification and quantification of EEE to define the lifespan statistics for Greek households, thus refining the results of population balance models, through the use of a questionnaire study. The estimation of generated WEEE amounts is based on the EEE put on the market, a detailed questionnaire-based study, and the lifespan distribution of EEE. The questionnaire was targeted to Greek between the age of 18 and 80, and distributed to over 250 households. The analysis of the questionnaires showed that the average amount of EEE (lamps are excluded) in Greek households is 48 items. The age distribution of EEE in Greek households seems to differ from the one reported in the EU Member States of North Europe. The lifespan of EEE stock tends to expand as consumers choose to repair them.

Keywords: EEE, lifespan statistics, Greek households

Introduction

In the past two decades, several statistical models have been employed in order to calculate the amount of Electrical and Electronic Equipment (EEE) put on the market and the generated Waste Electrical and Electronic Equipment (WEEE) [1-3]. Most of the available estimates are based on the EEE put on the market and the lifespan distribution of different categories of EEE (i.e. the statistical distribution of the time required for EEE items in each category to become waste). However, this lifespan distribution varies over space and time, as differences in purchasing power and consumption habits result in differences in the replacement time of the various EEE items. Moreover, lifespan estimates derive from studies in the Netherlands or Nordic countries, casting doubts about the validity of their results for Greece and other EU Member States. To date there is no reliable lifespan estimate of EEE categories in Greece, neither a robust prediction of their stock and WEEE generation rate. To improve these estimations models, the conduction of surveys on household level is deemed crucial.

This preliminary study aims at the identification and quantification of EEE to define the lifespan statistics for Greek households, thus refining the results of population balance models, through the use of a questionnaire study. More specifically, this study attempts to estimate the amount WEEE that are and will be generated in Greek households within the next two decades.

Methodology

The estimation of generated WEEE amounts is based on the EEE put on the market, a detailed questionnaire-based study, and the lifespan distribution of EEE. The questionnaire was targeted to Greek between the age of 18 and 80, and distributed to over 250 households inviting them to participate with a front page which explained the purpose of the study. To date, 221 questionnaires have been filled in, out of which 85 have been analyzed. In order to get comparable results, the UNU-keys [4] were utilized for the classification of the EEE.

Results

The preliminary analysis of the questionnaires showed that the average amount of EEE (lamps are excluded) in Greek households is 48 items, which is lower than the findings regarding the EEE stock in Belgian households [1]. Despite the economic recession in Greece, almost all (94%) of the responders stated that they have bought new large appliances. Only 6% have bought a used large appliance.

The age distribution of some categories of EEE in Greek households differs from the one reported in the EU Member States of North Europe. This difference might be due to the economic recession in Greece and the subsequent decrease on the put on the market (from 2009 on).

Approximately 60% of the Greek responders would choose to repair a broken / malfunctioned device, leading to the expansion of its lifespan. In case repairing is not feasible, approximately 80% of Greek consumers stated that they would recycle it.

Many of the responders stated that they have stocked devices, which are functional but they do not use. Usually, these devices are DVD players, cameras, coffee makers, and PC accessories. When asked the reason why the store obsolete devices, they asked: 1. For sentimental reasons, 2. No access to a recycling bin / center, 3. They might prove useful in near future, 4. They might donate them in people in need.

Acknowledgements

References

1. Huisman J. (W)EEE Mass balance and market structure in Belgium, Final report commissioned by Recupel, FFact Management Consultants, United Nations University, Delft, 2013.
2. Kim S., Oguchi M., Yoshida A. and Terazono A. Estimating the amount of WEEE generated in South Korea by using the population balance model. Waste Management, 33 (2013), 474-483.
3. TemaNord. Method to measure the amount of WEEE generated, Report to Nordic council's subgroup on EEE waste. Nordic Council of Ministers, Copenhagen, 2009.

4. Balde C.P., Kuehr R., Blumenthal K., Fondeur S., Kern M., Micheli P., Magpantay E. and Huisman J. E-waste statistics: Guidelines on classifications, reporting and indicators. United Nations University, IAS –SCYCLE, Bonn, Germany, 2015.