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Policy briefs in the framework of the « Prospective Research »

WEEE Reuse and Recycling : the role of the SE in relocating the WEEE treatment in Brussels

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Key messages

- Waste of electric and electronic equipment (WEEE) is one of the fastest growing waste streams (+ 5% growth annually), and also one of the most valuable (both in monetary terms as in critical resource content), however, WEEE is increasingly difficult to recycle due to its increasingly complex composition (more different materials, more dispersed, in smaller amounts and in a larger number of devices (IoT – Internet of Things)

- Because of its focus on preparation for reuse and its deeper dismantling practices, end of life treatment by social economy (SE) actors has additional ecological advantages.

- It is advisable to promote repair for reuse option as the default option, before considering recycling, thus making recycling complementary to repair for reuse instead of the other way around as is currently the case.

- The strengthening of reuse through the support of the social economy of reuse could imply a partial relocation of the treatment of WEEE on the Brussels territory, which would slow down, or even reduce, the outflow of WEEE from the Brussels-Capital Region.

- The ongoing ecological transition of the economy should not be based solely on precarious jobs in terms of remuneration and quality of employment (working conditions and meaning, workers' remuneration) in the processing of WEEE. Essential productive activities for the ecological transition of the economy and consumption should create quality jobs.

Introduction
Summary of the problem

In the Brussels region, the amount of new domestic EEE put on the market amounted to almost 27000 tonnes for 2019 or 22,3 kg per inhabitant[1], this amount is expected to further increase due to technological innovations[2]. At their end of life, EEE have a large potential for the circular economy and job creation. Especially IT and telecommunications equipment are a rich source of valuable materials[3], many of which are considered strategic and critical for Europe because of the risks of supply shortage and their importance for green energy and high-tech applications[4]. Although conventional recycling in Belgium is the default option, most of these critical materials are not currently recovered[5].

1 (Recupel2019) 1.208.542 inhabitants - figures INS on 01/01/2019.
2 (UNU 2013)
3 (reference)
4 (https://ec.europa.eu/growth/sectors/raw-materials/policy-strategy/)
5 (reference, p.ex Hageluken2013)

Although metal recovery facilities are not easily compatible with an urban context and social economy, there is a lot of room for reinforcing its role in the stages that precede recycling. In the Brussels Region, currently only 4,65 kg of WEEE per inhabitant are collected according to regulatory requirements, most of which is immediately directed towards recycling facilities outside the Brussels Region. The current research is focused on identifying what stages are compatible with an urban context and the social economy, how the collection can be oriented towards a bigger regional involvement and what complementarities exist between conventional and social economy actors.

Methods, approaches and results/body

Through a qualitative and interdisciplinary analysis combining social and applied sciences, the research aims to identify and understand the multiple pathways of EEE at the end of their life and the technical, economic, social, spatial, and public policy factors that shape them. For the technical side, WEEE items were dismantled and analysed to determine their material composition, dismantling characteristics, their potential value and the associated environmental end of life issues. WEEEs were selected either because of their high potential material value (gold, indium and other metals in desktop computers, servers, modems, cellular phones) or because they are representative due to the large share in total WEEEs (small household appliances) or because they represent new and upcoming trends (electric scooters).

These results were put into context through ethnographic observations in two SE structures that dismantle WEEE and semi-structured interviews that allowed us to understand the work organisation and the relationship to work of workers in SE WEEE treatment facilities. Besides site visits of SE facilities in Belgium, France and Québec, interviews and analysis of public policy documents then served to identify other non-technical, economic, policy and social guiding factors and understand the rationale of the existing industry actors and public policy implementation.

Based on these elements, the decision tree made for this project reveals the economic, market and supply chain logic that allows having a clear picture of where and why WEEE is leaving the Brussels territory and gives guidance on the potential development of WEEE management in the Brussels Capital Region.

Conclusions

Opportunities for recovering critical metals from manual dismantling of WEEE are limited due to market constraints related to high labour costs, technical difficulties and relatively low material value per item[6]. Repair and preparation for reuse are more compatible with the Brussels urban context, allow for local and small-scale initiatives, have a bigger potential for low-skilled workers to develop useful competences and, are more interesting from an ecological point of view. Initiatives already exist on the Brussels territory, but current collection systems are not sufficiently geared towards repair, and the collection rate should drastically improve. Although the Brussels policy framework gives incentives, initiative is left to the market regulation. Few additional resources are actually devoted to enhance WEEE reuse and the creation of long-term jobs. Consequently, the SE model leads to transitional jobs with little perspective on secure employment, unlikely to contribute to work force development.We identified in the project different levels of potential policy actions.

6 Chiffers : 0,8 à 1 € material value for a smartphone

Policy recommendations

Enhancing reuse by the partial reallocation of the ERP contribution:

According to Lansink's ladder and in line with insights from LCA (Life Cycle Analysis), reuse is generally preferable over recycling. However, from a consumer's point of view, recycling is far easier as WEEE collection is geared towards industrial recycling. Although the policy framework has recently prioritized reuse over recycling, the implementation analysis highlights that the legal framework advantages the recycling, over the reuse, by constraining producers to recycle through the ERP and by negotiating with them the reuse. The decision tree shows that the consumer options are a major determining factor in the path followed by WEEE at their end of use. While recycling is predominantly automatized, the costs of reuse are higher because it implies more manual work. Indeed, improving reuse also implies increasing preserving collection, sorting, repair and dismantling. This imposes an economic constraint to developing reuse. Currently, recycling receives more funding than reuse thanks to the ERP fee payed by consumers. In order to improve reuse of a greater EEE volume, metal recovery and circularisation, additional resources are needed. However, the used value of EEE represents a great potential to develop this activity. To be more attractive and tradable, the price of reused EEE and goods in general must be lower than new ones. The analysis of the policy framework shows that there is no public and political support to create a new ecotaxe to finance EEE reuse. It leads to consider the reallocation of existing incomes. Consequently, a percentage of the ERP (Extended Responsibility of Producers) fees could be dedicated to reuse. (The EU directive (2012/19/EU) also recognises the necessity of reuse. In addition, the ERP has failed in the eco-conception spreading.) In doing so, the additional cost of human labour could be covered without creating a new tax. The market fails to finance the local reuse, that is why a collective financial device should be an alternative to develop processes with a more positive environmental impact for society and nature preservation.

Improving the quality of manual work in the processes of reuse, reparation and dismantling.

The transition to a more circular and sustainable economy should secure jobs and professions implementing and fostering its principle. To avoid waste resources, manual labour is necessary to extend the life span of EEE and the recovery of precious metals, and thus the ecological transition of the economy. Even for recycling, the manual treatment of WEEE allows a greater homogeneity of the recycled flows (Grosse, 2011). Carrying out work of general interest (Sacco, 2018), both social and environmental, it is important to value these jobs and not to make them more precarious than they already are. These jobs created in the social economy are largely fixed-term jobs in a sector where the mechanization of recycling tasks has reduced opportunities for job creation. Indeed, it is important to retain people in these jobs to improve skills and know-how and to optimise the different activities useful to extend the lifespan of devices and their components. Given the number and diversity of EEEs, experience is needed to assess their reusability, repairability and selection to the most appropriate upgrading and recycling channels. Therefore, workers should have better employment statuses that provide both job security and symbolic recognition of their social and environmental utility. Policy devices such as the "enterprise with employment purpose" with decent wages or long-term contract for these tasks (similarly to the ACS) should be promoted and financed.

Improving and transferring the knowledge about WEEE.

The management of WEEE has also a lot to do with techniques and science. Knowledge about WEEE should be deepened to improve their ecological management, both for reuse and recycling. On the reuse side, to increase the WEEE collection volumes, data that are more precise would help to assess the efficiency, to define quantitative goals of collection and reuse and to identify the losses during the process in a traceability perspective. On the recycling side, the best recycling process for a type of WEEE depends on its chemical composition. Chemical analyses are necessary because dismantling is not sufficient to identify the chemical components. Indeed, some parts, though having similar functions, for example magnets or capacitors, may have completely different compositions, and thus different ideal path of recycling. Those differences were pointed out for appliances with similar functionalities but also within identical models. The access to the chemical composition of their WEEE should be facilitated for recyclers. Four concrete propositions seem relevant to solve these issues. First, we suggest improving the traceability in the reuse path. Second, we recommend supporting the creation of a European Database for Bill of Materials in order to induce producers to provide the chemical composition of each device they put on the European market. This Database is currently discussed, but is opposed based on trade secrets. Third, it would be useful to create a local "Device Observatory" which consists in a structure equipped and maned to evaluate the chemical composition of devices sent by dismantlers and recyclers. This implies to finance acquisition of equipment and training of technicians, so each actor could characterize their WEEE.

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List of publications

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Fort question you can contact the 3 researchers who developed the decision tree, by email.

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