

Impact

In the case of the CloseWEEE project, generated WEEE plastic waste will become new raw material for cradle to cradle applications, which means a rational use of resources. The CloseWEEE approach covers the full value chain, from secondary raw material recovery from WEEE to the manufacturing of new products. Whereas plastics' recycling from other sectors is largely established, although on a low level, there is close to zero material recovery from WEEE.



In the medium to longer term CloseWEEE can contribute to unlock a significant volume of various raw materials within EU28 through conversion of wastes or secondary raw materials not currently exploited into valuable resources. In the shorter term, the project aims to achieve a measurable increase in the efficiency of exploitation of secondary raw materials' deposits ('urban mines') against the state of the art.



Increased range and yields of recovered materials and energy efficiency, reduced environmental footprint measured by qualitative and quantitative indicators.



More sustainable consumption and production patterns, improved communication and transfer of knowledge to policy makers, business and to the general public.

If it was feasible to recover plastics from the halogen containing fractions, the economic balance might change so that it would be more profitable to recycle these streams in EU. This would benefit the EU through:



better control of plastic raw materials,



ability to add value to the plastics in the EU rather than letting value added activities occur in the developing countries,



green jobs,



prevention of less desirable EH&S outcomes due to improper handling in developing countries.

CloseWEEE Partners



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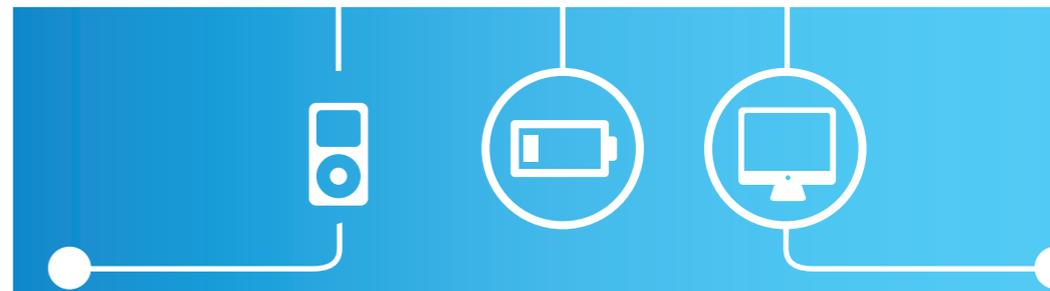
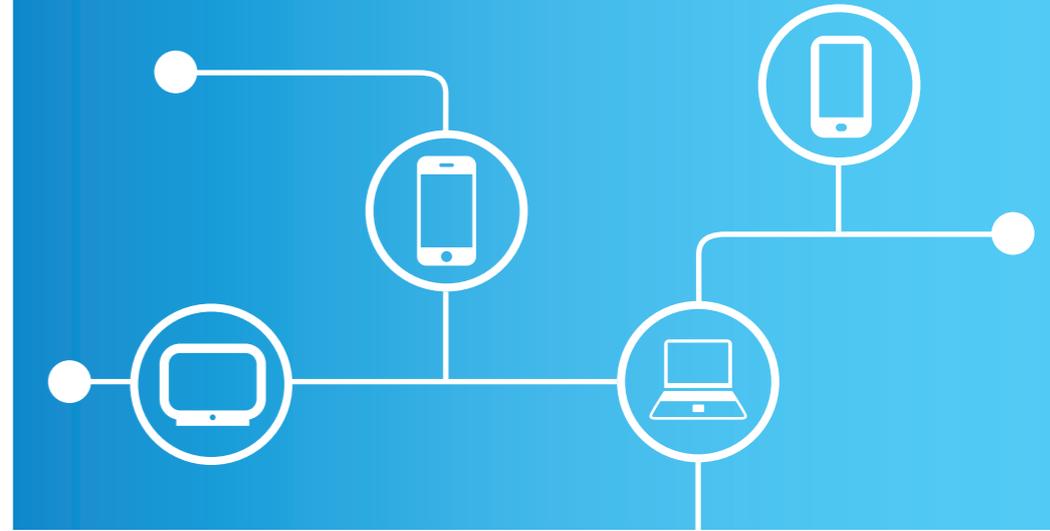
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Integrated solutions for pre-processing electronic equipment, closing the loop of post-consumer high-grade plastics, and advanced recovery of critical raw materials antimony and graphite

CloseWEEE Concept

The CloseWEEE project integrates three interlinked research and innovation areas for improved, resource-efficient recycling of polymer materials and critical raw materials from electrical and electronics equipment (EEE):

- 1 Efficient and effective disassembly of EEE for high quality material fractions, separation of materials but also for reuse of components and parts.
- 2 Developing resource-efficient and innovative solutions for closing the loop of post-consumer high-grade plastics from WEEE.
- 3 Improved recycling of Lithium-ion batteries through increasing the recovery rates of cobalt and researching recovery technology for the critical raw material graphite from those batteries.

These technology innovations in the various stages of the EEE recycling value chain are complemented by research on reusing the recovered polymer fractions in new EEE, defining product design measures in favour of an optimised recycling eco-system, embedding related product design criteria in EU policy measures and global green procurement activities. These activities will support effectively the objectives of the European Innovation Partnership on Raw Materials.

Background

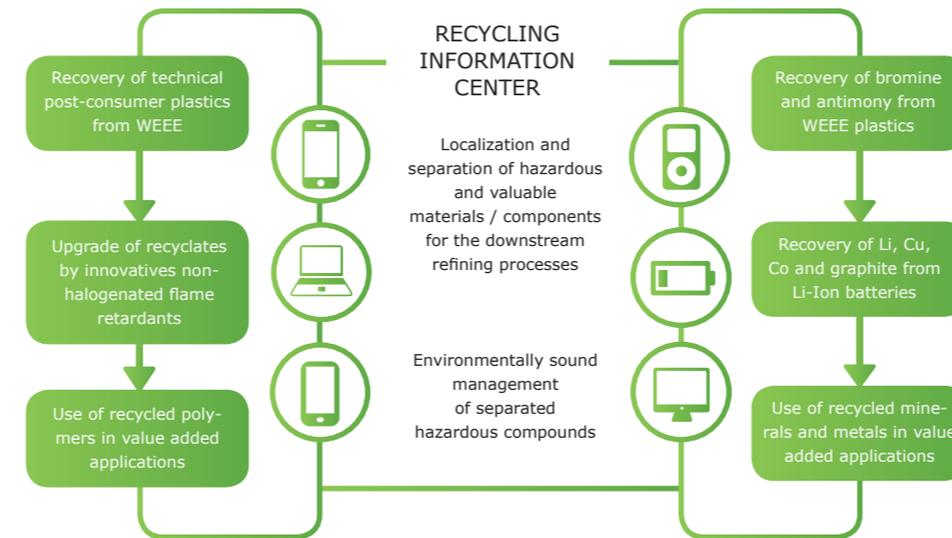
Waste of electric and electronic equipment (WEEE) is a complex waste stream comprising of metal, glass, wood, and plastic.

For the year 2012 Eurostat reports an amount of 9.5 Mio. tonnes of waste electric and electronic equipment which has been put on the European market, which exceeds the 3.3 Mio tonnes of collected electric and electronic equipment waste by far.

WEEE contains significant amounts of highly valuable materials and hazardous compounds. With respect to the tremendous amount, a recovery of secondary raw materials from WEEE is mandatory and has been requested by the European WEEE directive.

Whereas for many components for WEEE, effective recycling technologies have already been developed and put into practice (e.g. copper, gold, polypropylene (PP), polystyrene (PS)) there are significant amounts of valuable components which are not exploited yet.

CloseWEEE Approach



CloseWEEE Objectives

CloseWEEE envisages **closing the loop** by:

- 1 developing and implementing robust and cost efficient recovery technologies,
- 2 giving recycled materials a new life in added-value applications and
- 3 providing efficient tools for the localisation and separation of hazardous and valuable materials.

The main goal of CloseWEEE is therefore to increase the range and yields of recovered materials from WEEE streams. The research activities intend to:

- ✓ increase the recovery yield of PC-ABS and PPE-PS to 80% of their content in the WEEE plastic input;
- ✓ increase the application of recycled PC-ABS and PPE-PS in new EEE enclosures by defining and production of suitable products with a minimum share of 20% recycled polymer;
- ✓ raise recovery yields of BFR and Sb_2O_3 to 80% of their content in the WEEE plastic input;
- ✓ minimize levels of hazardous compounds in any product fraction to levels, which meet the requirements specified by safety regulation and standards of manufacturing companies.
- ✓ Reduce the losses of Co and graphite during treatment of waste Li-ion; by at least 50%.

