

Recovery of Electronic Waste through Advanced Recycling and Demonstration (REWARD)



eco-innovation



PHB



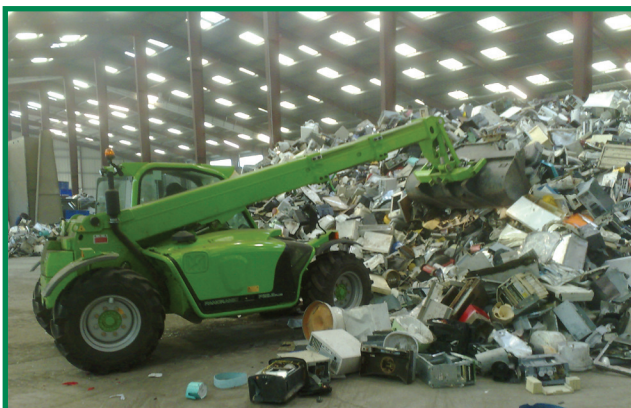
Electronic Waste (WEEE) needs increasing recycling. In Europe the amount of WEEE generated is 12 million ton/yr. Only slightly over 2 million tons is recycled. WEEE will increase in the coming decades with an expected rate of at least 4%/yr, about three times higher than the growth of the average municipal waste. Much of the waste is exported to Africa, China and India and disassembled under inadequate working conditions. More than 78% of European WEEE is currently land filled or incinerated. In August 2009 the Dutch companies Dolphin Metal Separation in Harderwijk, PHB in Waalwijk, Promikron in Delft, Recycling Consult in Eindhoven and the French research institute BRGM in Orléans jointly decided to investigate improved recycling through better size reduction, smart sensor sorting and advanced separation techniques. The consortium of companies has set out a range of demonstrations with the end result a design of a new prototype recycling facility for WEEE.

A resource of metals and materials

WEEE contains different plastics that need further separation. Currently only part of the plastics is recovered. WEEE also contains ferrous and non-ferrous metals, precious metals, platinum group metals and rare earth metals, the latter are currently hardly recycled. The prices of these metals and materials are expected to increase by 15% annually due to increased demand, quotas, supply shortages and a limited number of suppliers.

Modern innovative size reduction and separation techniques

It is the purpose of the project to demonstrate in a number of demonstrations the generation of recyclable products from WEEE with a higher added value for substitution of virgin primary materials and for decreasing dependency on imports. This project will demonstrate advanced size reduction, separation and sorting techniques as verified by earlier laboratory analyses. A dozen full scale unit processes will be demonstrated in this project. They include among others: improved size reduction for optimal material liberation and better subsequent separation; metal detection sensor sorting; smart magnetic separation for magnetic metals and materials; the latest eddy current techniques; advanced density separation; electro-magnetic sorting; a variety of x-ray sensors; colour sensor sorting and near-Infrared sensor sorting. These best available technologies are investigated for maximum liberation, optimal size distribution, maximum grade and recovery with lowest cost and best revenue. The new design of a demonstration plant will generate more fractions of high purity suitable for recycling. These improved technologies are required for increased internal EU utilization of discarded e-wastes, reduced environmental and human health impacts from disposed hazardous materials and reduced export of dangerous materials to developing countries. The partners have large dissemination networks to facilitate the introduction of this technology in all 27 EU countries.



Expected and/or achieved results

Effective demonstrations have been performed with size reduction, screening, polymer type sensor sorting, flame retardant polymer separation, recovery of metals from incinerator ashes and metal recovery with magnets and eddy currents. We cooperate with the companies Steinert, Unisort-RTT, Titech, InashCo, Immark France, Redwave.

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