Innovative Hydrometallurgical Processes to recover metals from WEEE including lamps and batteries

SEVENTH FRAMEWORK PROGRAMME

Executive summary

The recycling business is traditionally dominated by SMEs. In the last 5 - 10 years a general trend in the electronics recycling sector to bigger companies is very visible. Multinational, multisector companies are buying several smaller recyclers every year.

This trend is caused by 2 factors:

- Many countries transposed the WEEE- and Battery Directives in a way relying heavily on collective systems.
- Also the big secondary raw material processors are more interested in few big contracts instead of a lot of small contracts as this brings down their administrative costs. Therefore it is close to impossible to sell materials with a high metal concentration for SMEs at the moment.

Therefore the HydroWEEE project dealt with the recovery of rare and precious metals from WEEE including lamps and spent batteries by hydrometallurgical processes. The idea was to develop a mobile plant using hydrometallurgical processes to extract metals like Copper (Cu), Manganese (Mn), Zinc (Zn), Yttrium (Y), Indium (In), … in a high purity (above 95%). By making this plant mobile (in a container) several SMEs can benefit from the same plant at different times and therefore limit the necessary quantities of waste as well as investments. In addition this new HydroWEEE process produces pure enough materials that they can be directly used by end-users. Because of this 2 levels of intermediaries (bigger recyclers and secondary material processors) will be bypassed. This will make the SMEs much more competitive than today and reverse the general trend to bigger companies. In conclusion, the main innovation of HydroWEEE was to develop recovery processes of metals in a way that they are usable (knowledge) and cost effective for SMEs (necessary investments and quantities of materials).

This process has been demonstrated in a mobile pilot plant in Italy, Romania and Serbia for CRTs (Cathode Ray Tube monitors), lamps, LCDs (Liquid Crystal Displays), PCBs (Printed Circuit Boards and batteries.

The HydroWEEE consortium consisted of 9 partners from 4 countries - 3 EU Member States (Austria, Italy and Romania) and a Western Balkan Country (Serbia).

http://www.sat-research.at/hydroWEEE/