**HydroWEEE Demo**

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

- Coordinator: ISL
- 9 partners from 4 countries
- Duration: 48 months
- Costs: 3,8 mio €
- Start: October 1, 2012

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**Project partners**

**SMEs:**
- ISL – Kopacek KG (AT)
- EcoRecycling (IT)
- Greentronics (RO)
- Relight (IT)
- SET Recycling (RS)

**RTD-Performers:**
- Institute Mihailo Pupin (RS)
- HTR = UNIROMA+UNIVAQ+UNIVPM (IT)
Motivation

- Waste from Electrical and Electronic Equipment (WEEE) is the fastest growing waste stream (2-5% per annum) in Europe.
- Electr(on)ic products consist of a high amount of diverse metals, the precious and rare metals in very small quantities.
- Regardless of their low amount in specific electronic components there are some metals which are highly preferred or are even essential for the present technology.

20 critical materials (EC, 2013)

- Antimony
- Beryllium
- Borates
- Chromium
- Cobalt
- Coking coal
- Fluorspar
- Gallium
- Germanium
- Indium
- Magnesite
- Magnesium
- Natural Graphite
- Niobium
- PGMs
- Phosphate Rock
- REEs (Heavy)
- REEs (Light)
- Silicon Metal
- Tungsten
Motivation

Recycling business traditionally dominated by SMEs

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Number of companies</td>
<td>14,400</td>
</tr>
<tr>
<td>% SME</td>
<td>80%</td>
</tr>
<tr>
<td>Turnover (in Mio €)</td>
<td>30,000</td>
</tr>
<tr>
<td>Value creation (in Mio €)</td>
<td>6,300</td>
</tr>
<tr>
<td>Employees</td>
<td>130,000</td>
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Motivation

Trend in the electronics recycling sector to bigger multinational, multi-sectorial companies because

• (monopolistic) collective systems usually contract only 2 or 3 recycling companies, which favors bigger multinational groups

• Secondary raw material processors are interested in few big contracts because of fixed costs (notification, sampling, …)

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<thead>
<tr>
<th></th>
<th>Capacity mobile plant (tons)</th>
<th>Input WEEE (tons)</th>
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<tbody>
<tr>
<td>Fluorescent lamps</td>
<td>315</td>
<td>10.000</td>
</tr>
<tr>
<td>Cathode Ray Tubes</td>
<td>315</td>
<td>150.000</td>
</tr>
<tr>
<td>Liquid Crystal Displays</td>
<td>420</td>
<td>7.000</td>
</tr>
<tr>
<td>Printed Circuit Boards</td>
<td>315</td>
<td>315</td>
</tr>
<tr>
<td>Li-Ion batteries</td>
<td>140</td>
<td>280</td>
</tr>
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</table>
Main Goal

To recover rare and precious metals from WEEE including lamps and spent batteries by hydrometallurgical processes

Demonstration Objectives

• to design, build and demonstrate the first innovative industrial-like stationary HydroWEEE plant to recycle precious and rare metals. It will focus mainly on the processing of CRT- and lamps-powder as well as LCDs

• to design, build and demonstrate the first full-scale, industrial mobile HydroWEEE plant that will be capable of processing all fractions (CRT, lamps, LCDs, Li-batteries, printed circuit boards, ...) in 2 or more containers
Research Objectives

- The previously developed processes of extracting yttrium, indium, lithium, cobalt, zinc, copper, gold, silver, nickel, lead, tin **will be optimised** even more.
- Processes to **recover additional metals** (e.g., Cerium, Platinum, Palladium, Europium, Lanthanum, Terbium, …) from the same 5 fractions (CRT, lamps, LCDs, Li-batteries and printed circuit boards) from WEEE and catalysts will be developed.
- **Innovative solutions for the integrated treatment of waste water and the other solid wastes** have to be found.

Work package Overview
More information

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