



PROJECT DETAILS

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EUROPEAN PROJECT »ADIR«

NEXT GENERATION URBAN MINING

AUTOMATED DISASSEMBLY, SEPARATION AND RECOVERY
OF VALUABLE MATERIALS FROM ELECTRONIC EQUIPMENT

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Acronym ADIR
Starting date September 1, 2015
Ending date December 31, 2019
Topic SPIRE-07-2015 – Recovery technologies
for metals and other minerals

FUNDING

This project has received funding from the
European Union's Horizon 2020 research and innovation
programme under grant agreement No 680449.

For further information please see:
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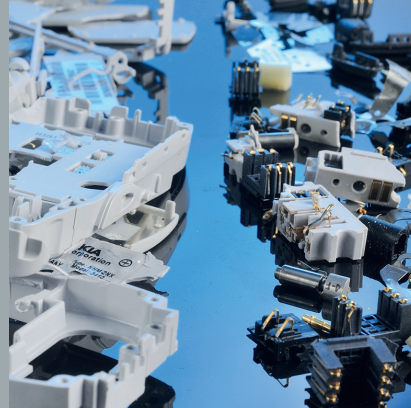
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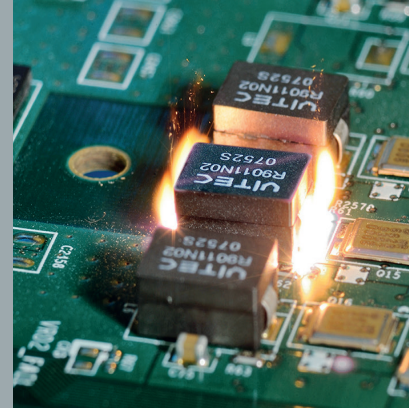




Around 190 million end-of-life cell phones per year in Europe.



Selective disassembly.



Desoldering.



Recovery of valuable materials.

OBJECTIVE

Specific raw materials become increasingly important to manufacture high level industrial products. Especially electronic equipment contains precious metals and a series of strategic raw materials.

To date the material specific recycling is focused on mass flow concepts such as shredder processes and metallurgy to extract the high-value metallic constituents, i.e. gold, silver, copper. However, a series of critical elements cannot be recovered efficiently or is even lost in dust or residual fractions as, e.g. tantalum.

The goal of ADIR is to demonstrate the feasibility of a key technology for next generation urban mining. An automated disassembly of electronic equipment will be worked out to separate and recover valuable materials.

CONSORTIUM



TECHNOLOGY

Robotic handling

Intelligent robotics is employed to disassemble cell phones, to extract batteries, to pick printed circuit boards and to transfer them to and from the laser measurement and laser processing machines of the ADIR demonstrator.

Image processing

High-resolution imaging enables the identification of units and electronic components by comparison with a stepwise growing internal data base.

Pulsed power technology

Innovative developments will provide a fast and efficient liberation of modules from pre-disassembled mobile phones with minimized mechanical damage of valuable components.

3D laser measurement

Geometry determination of individual electronic components supports component identification and the process sequence of laser-based extraction.

Real-time laser material identification

Surface penetrating laser spectroscopy identifies the valuable material inside electronic components and determines which of these shall be extracted selectively.

Laser processing

Fast and contact-free laser desoldering and cutting detaches electronic components and modules from circuit boards without destruction of their physical integrity.

Automatic separation

The dismantled components and modules are sorted into high-value fractions suited for subsequent metallurgical treatment on an industrial scale.

Metallurgy

Efficient modern metallurgical processes which are matched with the composition of each separate sorting fraction maximize the recovery of valuable elements and minimize the losses of strategic raw material.

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