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[Immediate release]

PEACOC Project Set to Upscale Two Innovative Technologies in 2023

The PEACOC project partners held their initial review meeting with the European Commission's and the external reviewers in San Sebastian in February 2023. With the upscaling phase of the project set to begin soon, it was the perfect opportunity to announce the successful completion of the second milestone and showcase the technological advancements made during the concentration stage optimisation.

The NOVA technology: Retrieving Value from Old Electronic Devices Through the Recycling of Precious Metals

The [GeMMe Research Group](#) at [University of Liege \(ULiège\)](#) (BE) led the optimisation of the **NOVA technology**. This particular task focused on designing and enhancing the process to make better use of mid and low-grade Printed Circuit Board Assemblies (PCBAs) that are typically sent outside of Europe due to low interest from smelters. Specifically, the researchers from ULiège conducted experiments on two types of PCBAs: one retrieved from end-of-life (EoL) Cathode-ray tube Television (CRT TVs) and the other from Liquid-crystal-display Television (LCD TVs). As part of the small-scale optimisation phase, the research team processed over 100 kg of PCBAs using the NOVA technology.

Using a combination of electrochemistry and mechanical activation, NOVA technology enables the detachment of electronic components soldered on the PCBA. Experimental work showed precious metals (PMs) can be concentrated mostly in the electronic components while few remain in the tin (Sn) concentrate and the copper-rich (Cu) depopulated PCBAs obtained from the NOVA process. These fractions can be further processed to valorise gold (Au) – from electronic components – and silver (Ag), Cu and Sn – from the Sn concentrate and depopulated PCBAs.

After evaluating various pre-processing methods and reactor designs, researchers have concluded that the "rotary screen reactor" is the most effective design to support the NOVA process's further scaling, due to its increased recovery rates.

Results reported at the end of the small-scale optimisation phase demonstrate promising routes capable of unlocking the domestic extraction of all remaining PMs along with important societal metals such as Sn and Cu available in the "lower grade" PCBAs.

Economic factors were analysed, considering the purchase costs of PCBAs, product revenues, and processing costs. The evaluation was conducted for a standard production of 3t/day. The findings indicate that the NOVA process is a profitable option for both types of PCBAs, with projecting earnings reaching 805 to 965 €/t for LCD TVs, while reaching 115 €/t for CRT TVs.

PEACOC project successfully tests the Roller Sorting and the Magnetic Density Separation processes for PCBA components separation

[Delft University of Technology \(TU Delft\)](#) conducted a series of experimental activities as part of the [PEACOC project](#) to assess the effectiveness of the Roller Sorting and the Magnetic Density Separation (MDS) processes. The primary objective of the research focused on consolidating the components containing Au, Ag and Pd with relatively high recoveries. The experimental work testing the performance of these two processes involved a roller sorter, a superconducting magnet, a magnetic fluid and a separation container precisely tailored after running various simulation models.

The PCBA components dismantled from motherboards were classified into target and non-target components, while the Roller Sorting and the MDS experiment carried out the separation between them. The results in the final development report have confirmed the successful separation of components containing Au, Ag and Pd from less valuable components. The research team at TU Delft has also undertaken further design work for the MDS pilot plant, which is intended for continuous mass production with minimising the consumption of magnetic fluid. The necessary devices are currently being prepared.

Apart from successfully achieving the second milestone of the PEACOC project, the first review meeting provided partners with the opportunity to present a list of submitted patents and exploitable results with the potential to be featured among other cutting-edge EU-funded innovations on the [Innovation Radar Platform](#).

The project coordination team [TEC] pointed out: “The remarkable work carried out by our outstanding team has driven the success of PEACOC! Progress in optimising the up-concentration and the refining processes marks the first step towards pilot-scale implementation in 2023. Our PEACOC pilot aims to become an efficient and sustainable alternative for PMs supply in Europe. During this half of the project, [ULI](#) (Belgium) and [TUD](#) (Netherlands) have developed and tested the up-concentration technologies at the laboratory scale for PMs concentration from EoL products such as autocatalysts, WEEE, and PV scrap. These technologies are now being scaled up. [VITO](#) (Belgium) has successfully developed refining technologies for treating the obtained concentrates, and undergone modelling, as well as basic and conceptual engineering. As the detailed engineering of the PEACOC pilot nears completion, our partners in France ([6TM](#)), Belgium ([VITO](#)), and Spain ([CEI](#)) are scaling up the refining process. Furthermore, our team is actively developing innovative alternatives to valorise the recovered PMs into marketable products, such as new autocatalysts by [MON](#) (Greece), 3D printed products by [MBN](#), [ADM](#), and [3DHUB](#) (in Italy, Netherlands, and Greece, respectively), and individual PMs streams at [TEC](#) (Spain). To ensure the robustness of the PEACOC process, [TEC](#) (Spain) is also conducting Life Cycle Assessment (LCA) and Life Cycle Costing (LCC) studies for the PEACOC plant, while an exploitation and business plan is being developed by [ISL](#) (Austria). We are thrilled to share our latest results and eagerly looking forward to showcasing our progress in the coming months!”

About the PEACOC project

The PEACOC project is a collaborative research endeavour involving prominent European research institutions launched in May 2021 to develop and showcase a first-of-a-kind economically and environmentally viable pre-commercial metallurgical system for recovering PMs – a metal family which includes Platinum Group Metals (PGMs), as well as Au and Ag. PMs are highly important for the EU economy and have been deemed [critical raw materials](#) by the European Commission. The PEACOC concept is founded on previously developed recovery and refining technologies, upscaled to TRL 5 in the [PLATIRUS project](#): Deep Eutectic Solvents (DES) based extraction and separation of PGMs, [Microwave-assisted leaching \(MWAL\)](#), and [gas-diffusion electrocrystallisation \(GDEx\)](#).

Coordination team

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Visit the PEACOC project website → <https://www.peacoc-h2020.eu/>

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