CONSORTIUM

SINTEF

tecnalia

LCM less common metals

VAC VACUUMSCHMELZE

Elkem A Bluestar Company

idener

Ai3 INOVERTIS

liten cea tech

STENA

AVERE The European Association for Electromobility

SNAM Florentine

PNO

cefic

UNIVERSITÉ TOULOUSE III PAUL SABATIER

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REE4EU is a project funded by the European Commission

This project has received funding from the European Union's Horizon 2020 Research and Innovation program under Grant Agreement n° 680507

REE4EU

SPIRE Sustainable Process Industry through Resource and Energy Efficiency

REE4EU PROJECT

RARE EARTH RECYCLING FOR EUROPE

Integrated high temperature electrolysis and Ion liquid extraction for a strong and independent european rare earth elements supply chain.

www.ree4eu.eu

THE PROJECT

The project, funded in the frame of Horizon 2020 TOPIC SPIRE-07-2015, will realize a breakthrough innovation in the field of recovery technologies for metals and other minerals. It will make available rare earth elements and rare earth alloys for magnet production by developing, for the first time at industrial scale, an efficient and cost effective method of extraction and a direct production route for rare earth alloys which will be achieved through in-process and end-of-Life permanent magnets as well as Ni metal hydride battery waste.

OBJECTIVES

The REE4EU project will develop, validate and demonstrate in 2 industrially relevant pilots an innovative rare earth alloys production route from permanent magnets and nickel metal hydride battery waste.

The targeted integrated solution is based on recently developed lab-proven technologies for direct high temperature electrolysis of rare earth alloys production. It will be combined in the pilots with an innovative and proven Ionic liquid extraction or tailored hydrometallurgical pre-treatment.

BENEFITS

The targeted integrated solution will demonstrate dramatic improvements in cost and environmental performance compared to state of the art technologies:

- This includes avoidance of process steps,
- 50% energy savings,
- 100% recycling of reagents as opposed to disposal of strong acid leaching agents in state of the art pre-treatment steps.

FIRST YEAR PROJECT RESULTS

During the first year, the consortium has completed Phase 1 of the project, which saw the partners undertake lab-scale and off-line integration, tailoring the ionic liquid extraction (ILE) and high temperature electrolysis (HTE) steps of the project. The engineering teams IDENER and A3i-Inovertis, together with SINTEF, the University of Toulouse and Tecnalia, as well as the industrial partners responsible for the pilots, Elkem and Less Common Metals, established the corresponding conceptual engineering design for the process. Moreover, since the project involves the full value chain to prove technical and economic viability of this technology for recycling magnetic waste, a Value Chains Stakeholders Analysis Report has been realized by PNO, aiming at helping the REE4EU partners in setting up targeted dissemination and communications actions towards the relevant group of stakeholders from a specific value chain, and on the other hand, to provide information to the public at large on the relevant industrial and academic stakeholders that are connected to the topic of the recovery of REE. Furthermore a selected group of identified stakeholders are being interviewed to elaborate a market analysis on the most relevant EoL products containing REE. The Value Chain Stakeholder Analysis report is available at the project website.