REslag project

- Start/end date: 01/09/2015 – 28/02/2019
- Partners:

Dr. Iñigo Ortega Fernández
CIC Energigune
Project Case Study

1. The EU/SPIRE needs

Transition to a circular economy: valorization of an industrial waste, slag.

To improve industry competitiveness in a wide number of sectors.

Heat recovery, CO₂ emissions reduction and primary raw materials reduction.

2. The Project Solution

Five pilot plants:

Pilot 1: hydrometallurgical process for high added value metals extraction (Cu, Cr, Ni, Zn, etc).

Pilot 2: heat recovery system for the exhaust gases of an EAF.

Pilot 3a: TES system using slag and air.

Pilot 3b: TES system using slag and molten salt.

Pilot 4: refractory ceramics with slag in their composition.

3. Value to Customers

Industries will reduce energy (fossil fuels) and primary raw materials consumption.

An important process efficiency increase will be achieved in sectors such as intensive industrial processes (steel, glass, cement...) or the concentrated solar power.

Reduction in the manufacturing costs.

4. How will this happen?

Complete Life Cycle Assessment (LCA) with the data obtained in the pilots.

Up-scaling of the pilots will allow the performance evaluation of each pilot.

Market & application identification: mapping of the main actors & interests (risk evaluation).
What are the **key expected sustainability impacts** of **RESLAG**?

<table>
<thead>
<tr>
<th>Indicator (Max 3-4 key indicators)</th>
<th>Baseline</th>
<th>Expected Impact</th>
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<tbody>
<tr>
<td>Reduction of landfilled steel slag</td>
<td>Currently 25% of the produced slag is not valorised (~3 Mt)</td>
<td>Expected: complete treatment/valorisation. To be evaluated in the last year of project.</td>
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<tr>
<td>Reduction of the environmental impact of different industrial sectors (steel industry, refractory production etc.) avoiding CO₂ emissions from EU strategic industries.</td>
<td>Steelmaking sector: around 2 t\text{eq} CO₂ / produced steel ton</td>
<td>To be evaluated in the last year of project.</td>
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<td>Innovative and low cost heat storage solutions for the concentrated solar power (CSP) industry</td>
<td>Current technology is based in a double tank solution implementing as a heat storage medium molten nitrate salts</td>
<td>Partial/total reduction of the required amount of salts replacing them by slag. Move from a double-tank to a single-tank technology. Assessment of the proposed technology in the last year of the project.</td>
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<tr>
<td>Recycling and better management of critical materials</td>
<td>Currently these materials are not recovered at the end of its life.</td>
<td>Recovery of the critical materials contained in the slag avoiding its disposal.</td>
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*Core SPIRE indicator*
What **outputs or learning** from RESLAG could have value for other SPIRE projects here?

- **Refractory materials** with slag in their composition that can be used in a wide number of industries.
- **New technology for heat recovery** from the exhaust gases of an electric arc furnace.
- Slag-based **thermal energy storage systems** applicable in different industrial sectors.
- **Hydrometallurgical process** for high added value metals recovery from slag materials.
- **Web tool** for the LCA of the project-proposed pilot plants/applications.
- **Web tool** for mapping **waste streams** generated from steel industries to potential end users: [https://reslag.einszuzwei.de/](https://reslag.einszuzwei.de/).
- **Deliverable 7.2 (public):** Report on **criticality analysis** for selected elements (Lanthanum, Cerium, Neodymium, Manganese, Chromium).
Contact

Project coordinator email: jrodriguez@cicenergigune.com
Exploitation manager email: fernando.aguirre@hasten.es
Project website: http://www.reslag.eu/
https://www.linkedin.com/company/reslag
https://twitter.com/reslag_eu