

Partners



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FIRST YEAR PROJECT RESULTS

During this first year, the project successfully performed small-scale experiments in WP2 used as input in the upcoming pilot trials at Elkem. The separation of the different compounds through hydrometallurgical treatment has been optimized in WP3 and the modelling team in WP5 has created initial HSC and LCA models in which data from small-scale experiments have been used to verify the models. Data from the pilot experiments in WP2 and WP3 will be included when these will be available.



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Si
silicon

Al
aluminium

 **SisAl Pilot**

Innovative pilot for Silicon production with low environmental impact using secondary Aluminium and silicon raw materials

The timing of SisAl Pilot is impeccable with respect to key European challenges; the transformation to a circular economy, the strongly enhanced focus on climate and future expected EU-ETS CO₂ allowances with associated risk for carbon leakage from Europe, the rapidly increased difficulty of exporting aluminium scrap from Europe to China, and modern society's ever-increasing need for silicon metal. With SisAl, all these challenges are turned into new European opportunities.

The project

SisAl Pilot aims to demonstrate a patented novel industrial process to produce silicon (Si, a critical raw material), enabling a shift from today's carbothermic Submerged Arc Furnace (SAF) process to a far more environmentally and economically alternative: an aluminothermic reduction of quartz in slag that utilizes secondary raw materials such as aluminium (Al) scrap and dross, as replacements for carbon reductants used today.

Objectives

The overall objective of SisAl Pilot is to scale up and demonstrate a new European technology at TRL 6-7, using different raw material mixes to produce silicon and silicon alloys, along with MGA and HPA, validating product quality, environmental impact and economic parameters to lay the ground for commercialisation.

Specific objectives:

- Assess the performance and availability of raw materials for the SisAl process and its products
- Pre-industrial /pilot scale production of silicon and alumina products in five different pilot locations in Europe and South Africa
- Develop business case scenarios for project partner clusters;
- Benchmark the environmental and economic performance of the SisAl process and its products towards current technologies and products
- Disseminate and communicate the value created for Europe

Impact

SisAl Pilot represents a path-breaking approach, and a strong contribution to "circularity" through industrial symbiosis where the Al industry will act as both a raw material supplier and end user to the Si industry. Across sectors, SisAl Pilot will give substantial reductions in material yield losses, enhanced valorisation of waste-and by-product streams, at a 3 X lower energy consumption and radically lower emissions of CO₂ and harmful pollutants, at a considerably lower cost.

The SisAl process will achieve a simultaneous break-through in silicon production technology and aluminium secondary product valorisation, bringing Europe to the forefront of innovative and sustainable metal production.

