


RETROFEED ACHIEVEMENTS IN CERAMIC, CEMENT, ALUMINIUM, STEEL AND AGROCHEMICAL SECTORS



✦ **RETROFEED:** Implementation of a smart RETROfitting framework in the process industry towards its operation with variable, biobased and circular FEEDstock.

✦ **Coordinator:** CIRCE Research Centre

Total cost: 15,468,861.25 €

✦ **Call:** H2020-NMBP-SPIRE-2019

✦ **Duration:** 01.11.2019 - 31.10.2023



CERAMIC SECTOR



RESOURCE EFFICIENCY

+21%



ENERGY EFFICIENCY

+13%



GHG EMISSIONS

-13%



FOSSIL RESOURCES USE

-13%



OPEX

-4%



PRODUCTIVITY

+27%

CEMENT SECTOR



RESOURCE EFFICIENCY

+19%



ENERGY EFFICIENCY

+3%



GHG EMISSIONS

-3%



FOSSIL RESOURCES USE

-12%



OPEX

-8%



PRODUCTIVITY

+6%



ALUMINIUM SECTOR



RESOURCE EFFICIENCY

+33%



ENERGY EFFICIENCY

+19%



GHG EMISSIONS

-9%



FOSSIL RESOURCES USE

-12%



OPEX

+5%



PRODUCTIVITY

+37%



ASAS

Akyazi, Turkey



STEEL SECTOR

**FENO
PITTINI
GROUP**

Friuli, Italy



PITTINI



RESOURCE EFFICIENCY

+17%



ENERGY EFFICIENCY

+2%



GHG EMISSIONS

-3.9%



FOSSIL RESOURCES USE

-13%



OPEX

+2%



PRODUCTIVITY

+14%*

*Productivity is calculated as the ratio between liquid steel production and energy consumption in terms of only natural gas and carbon (being Electricity the main energy source in EAF). Productivity achieved increases by 3% when natural gas is reduced and by 11% when carbon is reduced, total 14%

STEEL SECTOR

**TENARIS
SILCOTUB**

Zalau, Romania



TenarisSilcotub



RESOURCE EFFICIENCY

+40%



ENERGY EFFICIENCY

+0.5%



GHG EMISSIONS

-0.2%



FOSSIL RESOURCES USE

-59%



OPEX

-2%



PRODUCTIVITY

+9%*

*Productivity is calculated as the ratio between liquid steel production and energy consumption in terms of only natural gas and carbon (being Electricity the main energy source in EAF). Productivity achieved is increased by 9% due to the reduction in fossil carbon injection

AGROCHEMICAL SECTOR

FERTIBERIA

Huelva, Spain



RESOURCE EFFICIENCY
+10%



























OPEX
-11%



PRODUCTIVITY
+12%

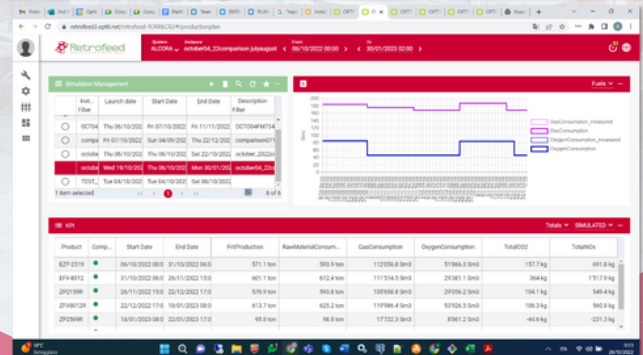
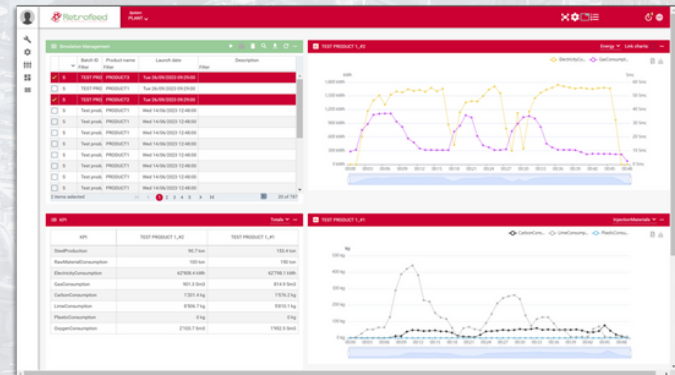
TECHNOLOGICAL SOLUTIONS IMPLEMENTED VIA RETROFEED

Demosite	Technology	TRL	Owner	Digital twin
 Fertiberia	✓ New reactor for alternative phosphorus sources	6	 Fertiberia	 Circce
 SECIL <small>Da forma ao vidro</small>	✓ Multi-fuel burner	8		 Circce
	✓ Image based combustion diagnosis tool	7	 Circce	
	✓ Real time clinker optical characterization	7	 aimen	
 ASAŞ	✓ New burner head design	9	 ST sistem teknik	
	✓ O ₂ injection system	9	 ST sistem teknik	
	✓ Delacquering system	9	 ST sistem teknik	
 TORRECID	✓ Redesign of the flue gases recovery system	9	 TORRECID	 Circce
	✓ Height of frit visual tool	7	 Circce	
 PITTINI	✓ Burner modification for feeding biochar and plastic grains	9	 HTT	 RISA
	✓ Feeding injection system for plastic grains	7	 HTT	
 TenarisSilcotub	✓ Feeding injection system for polymer	9	 TenarisSilcotub	 RISA

DIGITAL SOLUTIONS OF RETROFEED THE DSS: DECISION SUPPORT SYSTEM

- Enhanced Operational Efficiency
- Data-Driven-Decision Making
- Digital Workforce
- Supply Chain optimization
- Scalability and Adaptability

Embracing a **Decision Support System** is not just an option; it's the **key** to unlock data-driven insights, streamline processes, and ensure your business remain competitive in the market



RETROFEED E-LEARNING MODULES

RETROFEED has elaborated a free-of-charge online training “Reconstructing the Industry of Tomorrow” targeted at master students with the aim to **enhance the knowledge about retrofitting solutions** developed, and promote the replication and exploitation of results. Join the training here:

<https://retrofeed.geonardo.com/>



RETROFEED has demonstrated that is possible to enable the use of **variable, bio-based and circular feedstock** in intensive energy industries through the retrofitting of core equipment, the implementation of an **advanced monitoring and control system**, and the development of a **Decision Support System** that provides support the decisions of the plant operators.



@retrofeedEU



@Retrofeed EU project



Project Manager:
Diego Redondo
CIRCE Research Centre
dredondo@fcirce.es



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869939.