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***TRANSFORMATION OF INDUSTRIAL
BYPRODUCTS INTO NEW HI-TECH
PRODUCTS***

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CSM SpA was founded in 1963 by Italy's major steel manufacturers and end-users with the mission of developing Steel Technologies and its application.

From 2013 belongs to RINA Group.

CSM SpA is a leading company in the field of process and product innovation. It is operating worldwide in the steel and metal alloys as well as ceramics industrial production for different sectors such as oil&gas, aerospace, engineering, energy&environment. At present CSM SpA is also strongly involved in Industry 4.0, with many projects in the field of advanced process control, innovative sensors and measurement devices. CSM operates in six sites, with specialised labs and pilot plants.

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Trasformation of industrial byproducts into new hi-tech products

Introduction

By-products from Energy Intensive Industries is causing increasing difficulties and costs for direct recycling and landfilling.

The synergistic combination of various by-products from different industrial sources is today more and more pursued to reduce the problem. However this cross-sectorial approach is beneficial only if the created added values is significantly higher than the production costs.

Scope

The proposal addresses the valorisation of by products from steelmaking industry, agricultural residues, paper industry, plastic industry, into metallic powder to be used in powder metallurgy technology, which is a sector in expansion, because valuable components are produced at lower energy cost (iso-static pressure and additive manufacturing instead of energy cost foundry process) and where the economic recovery is more favorable than more conventional recycling options, such as steel scrap or coal substitution.

Trasformation of industrial byproducts into new hi-tech products

Ways and means

- *Mixing of mill-scale from steel production with carbon bearing wastes materials, such as non-recyclable plastics, charcoal from agricultural residues, by-product from paper industry.*
- *Adapting and applying reduction techniques to produce metallic iron powder at high level of purity.*
- *Validation of the product in application in both conventional powder metallurgy and innovative hi-tech Additive Manufacturing techniques*

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*The proposal addresses the **SPIRE 03-2018** call: Energy and resource efficiency in highly energy intensive industries.*

Modelling and multi-objective optimisation tools and techniques to reduce the global impact on the environment.

EXPECTED IMPACT

- 1. Reduction of by-products to be wasted with benefits on sustainability and environment.*
- 2. Production of high values products from low cost materials (mill-scale), instead of high cost pure materials, and process at lower energy cost, with benefits in terms of resource and energy saving.*
- 3. Increase of production of components from powder technologies, with benefits in terms of energy cost and environmental impact*
- 3. Promoting the cross sectorial approach in high technology industrial sectors, with benefits in terms of social diffusion and acceptance*

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Looking for partners from various sectors

Partner 1: Steel industry producing scale as by-products

Partner 2: Paper industry and/or plastic industry or consortium for plastic recycling

Partner 3: Agricultural farm and/or wood industry producing agricultural or wood residues, to be transformed in charcoal

Partner 4: Manufacturer of components from metal powder

CONTACT DETAILS

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