VULKANO

Novel integrated refurbishment solution as a key path towards creating eco-efficient and competitive furnaces

H2020-SPIRE-2016

Project Case Study

1. The EU/ SPIRE needs
Increasing the energy and environmental efficiency in existing industrial furnaces.
SPIRE goal: increase in 20% (absolute value) their overall efficiency and at least 27% of fossil fuel saving

2. The Project Solution
Advanced retrofitting integrated solution:
- high-temperature phase change materials,
- new refractories, optimized co-firing,
- advanced monitoring and control systems,
- and a holistic in-house predictive tool to optimize the integration of the solution with upstream and downstream processes

3. Value to Customers
Customers will be able to acquire an integrated solution including:
- refractories manufactured from industrial by-products with better properties,
- new PCMs working at higher temperatures,
- innovative co-firing solution for the use of renewable feedstock,
- the advanced M&C system and the holistic predictive tool to improve the decision making of the process.

4. How will this happen?
Certification of the materials and prototypes developed in the project (CE mark), encouraging the use of by-products and renewable feedstocks from the regulation, competitiveness with conventional fuel from market perspective
What are the **key expected sustainability impacts** of **VULKANO**?

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>BASELINE</th>
<th>EXPECTED IMPACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in CO2-equivalent GHG emissions gate to gate (tons/year)</td>
<td>1,953 at proposal stage</td>
<td>880,000 by 2030</td>
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<tr>
<td>Reduction of the use of energy from non-renewable sources (toe/year)</td>
<td>440 at proposal stage</td>
<td>201,000 by 2030</td>
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</table>
What **outputs or learning** from VULKANO could have value for other SPIRE projects here?

<table>
<thead>
<tr>
<th>NEW TECHNOLOGIES</th>
<th>IN-HOUSE TOOL</th>
<th>BY-PRODUCTS</th>
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<tbody>
<tr>
<td>Innovative refractories, Phase Change Materials, and burners for co-firing natural and syn-gas</td>
<td>An holistic in-house tool will validate the potential of predicting the performance of the process in industry furnaces in order to improve the design and process parameters</td>
<td>The use of industry by-products to develop new refractories will be demonstrated</td>
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<tr>
<th>NON FOSSIL FUELS</th>
<th>MONITORING &amp; CONTROL</th>
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<tr>
<td>Feasibility of natural gas substitution by different syngas source</td>
<td>Requirements specification for MC&amp;S in industrial furnaces from the end-user point of view</td>
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</table>
Our Motivation: Uptake of the process industry

VULKANO project will contribute not only to update the mainly old-aged European furnaces but also to create a path to follow in order to ensure a successful design in case of new furnaces.

SOURCE: Modern Times. 1936
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