



Innovative solutions for the energy efficiency in industries

Resource efficiency, and especially energy efficiency, is a key driver to a smart and sustainable growth, while promoting a more efficient and competitive economy based on knowledge and innovation

In this context the Research Centre for Energy Resources and Consumption, CIRCE (Spain) is leading several initiatives within EU projects addressing the improvement of resource efficiency in industry.

TOP-REF: RESOURCE EFFICIENCY IN INDUSTRY BY MONITORING

TOP-REF is an initiative coordinated by CIRCE in the framework of the industrial association SPIRE. The project consortium consists of industrial partners including Dow Chemical, Ibérica (DCI), Petrogal and Fertinagro (Tervalis Group)

TOP-REF will develop and demonstrate a resource-efficiency and cross-sectorial methodology, which will be validated by the development and testing of non-invasive control tools.

By means of this methodology, the project has shown the most inefficient spots (45% of the economic losses and 55% of the energetic losses), in the ethylene cracker of DCI in Tarragona, leading to estimated savings of 3M€ per year.

The application of TOP-REF at the Fertinagro plant (4.000 t of product /year) during the drying and transport process of the granulated fertilizer would imply a reduction of gas (2-5%) and power consumption (2-3%). This could represent estimated savings of up to 200.000-250.000 € per year. Furthermore, the savings at this plant are equivalent to the CO₂ emissions of 50 cars per year, or 90 houses. This provides an enormous potential, since the production of fertilizers in Europe, using the same process as Fertinagro's plant, is 40 Mt/year.

Furthermore, the project is a pioneer in the application of exergy as a Key Resource Indicator (KRI). Exergy enables us

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to compare the resource efficiency between different process scenarios, identifying inefficiencies, supporting decision-making, and detecting poor process performance.

NIWE: WIRELESS POWERING FOR INDUSTRIAL FURNACES

CIRCE is a worldwide leader in the development and application of inductive charge for electric vehicles. This technology has been used in the NIWE project, coordinated by Tecnalía, to improve the flexibility and efficiency in the foundry sector.

CIRCE, has designed and constructed a 100 kW industrial prototype for melting and maintaining aluminum, within the project, in order to be tested in real conditions. The WPT (Wireless Power Transfer) will transfer the power from the grid to a 500 Kg furnace with no wires, allowing the mobility of the furnace /ladle, and improving production flexibility.

The quick power transmission system allows the use of smaller and more flexible furnaces, improving efficiency and productivity in the plant. For example, in the aluminum sector, the energy waste, produced as a result of overheating the aluminum to maintain the temperature, is avoided. Finally, the more accurate temperature control improves the aluminum quality. ●

Contact details:

Diego Magallón Jorcano, Communication Officer
Tel: +34 976 762 957
Email: Dmagallon@fcirce.es
Web: www.fcirce.es
www.toprefproject.eu
www.niweproject.eu