

# Minimising energy loss in hot rolling by intelligent manufacturing



## PROJECT DETAILS

Funding Programme:  
Research Fund of Coal and  
Steel (RFCS)  
Sub-Programme:  
Steel Research  
Funding Scheme:  
Research Project  
Project Reference:  
00008;  
UE-10-RFSR-CT-2010-00008  
Project Duration:  
42 Months (from 2010-07-01  
to 2013-12-30)  
Total Project Value:  
€ 1.886.437  
EU Grant-Aid:  
€ 1.131.862  
Funding to UniOvi:  
€ 302.001'43

## PROJECT DESCRIPTION

The main energy input in hot rolling is the latent heat of hot charged slabs and the gasses applied in the reheating furnaces. The second energy input however is electricity. Several studies have already been performed as the energy efficiency in less than 40%. The energy loss in the hot rolling mill after reheating furnaces can however not be neglected as it represents 50% of the total energy loss in hot rolling operations. The energy loss consists mainly of electricity loss in the rolling stands and the coilers and the loss of thermal energy of the hot products by descaling systems, cooling systems and radiation. A through energy study of the hot rolling process from the reheating to the coiler has not yet been performed. Furthermore a lot of opportunities remain, related to the reduction of electricity in auxiliary systems (30% of the total electricity) and to recovery of the thermal energy in the hot rolled product by the use of new advanced technologies.

The objective of this proposal is to:

- minimize energy consumption in hot rolling
- define all energy flows in the hot rolling operation
- and, to recover as most as possible of the applied energy (e.g. latent heat) by intelligent manufacturing: the application of low energy technologies, the accurate knowledge of the process changes on the total energy consumption, an optimal scheduling and the recovery of heat.

## UNIOVI TEAM

Fernando Briz del Blanco <sub>1</sub>  
[fbriz@uniovi.es](mailto:fbriz@uniovi.es)  
José Manuel Cano Rodríguez <sub>1</sub>  
[jmcano@uniovi.es](mailto:jmcano@uniovi.es)  
Pablo García Fernández <sub>1</sub>  
[garciafpablo@uniovi.es](mailto:garciafpablo@uniovi.es)  
Alberto Benjamin Diez  
González <sub>1</sub>  
[abdiez@uniovi.es](mailto:abdiez@uniovi.es)  
David Díaz Reigosa <sub>1</sub>  
[diazdavid@uniovi.es](mailto:diazdavid@uniovi.es)  
Juan Manuel Guerrero Muñóz <sub>1</sub>  
[guerrero@uniovi.es](mailto:guerrero@uniovi.es)  
Diego Álvarez Prieto <sub>1</sub>  
[dalvarez@uniovi.es](mailto:dalvarez@uniovi.es)  
Joaquín González Norniella <sub>1</sub>  
[jgnorniella@uniovi.es](mailto:jgnorniella@uniovi.es)  
Carlos Hiram Rojas García <sub>1</sub>  
[chrojas@uniovi.es](mailto:chrojas@uniovi.es)  
Gonzalo Arturo Alonso Orcajo <sub>1</sub>  
[gonzalo@uniovi.es](mailto:gonzalo@uniovi.es)  
Joaquín Francisco Pedrayes González <sub>1</sub>  
[pedrayesjoaquin@uniovi.es](mailto:pedrayesjoaquin@uniovi.es)

<sub>1</sub> Department of Electrical, Electronic,  
Computers and Systems Engineering

## PROJECT PARTNERS

Project Coordinator  
Centre de Recherches Metallurgiques  
ASBL, Belgium

Spain  
Arcelormittal España S.A.  
Universidad de Oviedo  
Germany  
Vdeh-Betriebsforschungsinstitut GmbH