



# TGS2 “Steelmaking processes”

Panorámica y oportunidades en la  
Investigación e Innovación Siderúrgica  
en Europa

Madrid, 25-09-14



PLATAFORMA TECNOLÓGICA ESPAÑOLA DEL ACERO

Proyecto: INF – 2013 – 0162 – 020000, financiado por:



# Technical Content of the Steel TGS2



- Electric arc furnace processes
- Physico-chemical metallurgy of liquid steel and slag
- Recycling of steel scrap
- Secondary metallurgy techniques
- Standardisation of testing and evaluation methods
- Maintenance and reliability of production lines
- Reduction of emissions, energy consumption and improvement of the environmental impact
- Instrumentation, modelling and control of processes



# Ongoing Projects Scope – TGS2



1. Electric arc furnace processes
2. Physico-chemical metallurgy of liquid steel and slag
3. Recycling of steel scrap
4. Secondary metallurgy techniques
5. Standardisation of testing and evaluation methods
6. Maintenance and reliability of production lines
7. Reduction of emissions, energy consumption and improvement of the environmental impact
8. Instrumentation, modelling and control of processes

PROJECT (10)	MAIN TOPICS
LADLIFE	5
GREENEAF	1
INTCLEANCON	4
TOTOPTLIS	8
PROTECT	7
OPTDESLAG	4
PLUGWATCH	4
SLACON	7
MELTCON	1
ILORA	8

\*RFCS Projects with Spanish partners



# Research Guidelines Proposed by Experts

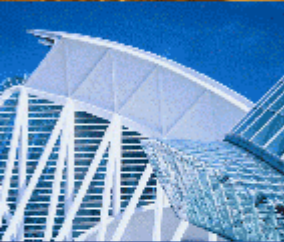


**Improvements on the productivity and flexibility of the process, leading finally to cost reduction**

**Coupling between new knowledge, new measurement tools and techniques, supported by extensive modelling work**

**Enhancing quality assurance and standards**

**Energy consumption & emissions rate**



# Steel Priorities 2014

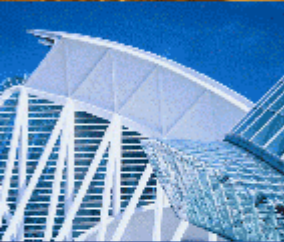


- 1 • Improved energy efficiency in high temperature processes
- 2 • Integration of process monitoring (online/offline), control and technical management of steel production using mathematical methods for a multi-criteria optimisation of steel production with respect to at least two of the following aspects: productivity, resource efficiency and product quality
- 3 • New or improved efficient processes to transform low quality raw materials
- 4 • Solutions at minimizing the ecological footprint of the Steel
- 5 • Measurement and on-line control of mechanical properties, through either new measurement techniques or improved physical models
- 6 • Development of new steel grades with improved technological property combinations (e.g. strength, formability, toughness, etc.) enabling more efficient steel applications (e.g. weight reduction, energy absorption, thermal shock resistance, wear...)
- 7 • Development of steel solutions for transport, construction or energy with improved LCA
- 8 • Safety of steel infrastructures for fluid storage and transportation in energy sector
- 9 • Improvement of working conditions in steel production through innovative solutions by use of both modelling and monitoring activities linked to health or safety aspect risk management

# Steel Industry Future Trends – TGS2



- Steelmaking controls both production costs and steel quality to a very high extend and thus a high level of expertise in the area will continue to be needed for a long time to come. Research is a very good way to meet this need!!
- Visualization techniques to assist operators and eventually real-time process control
- Modeling, through-process modeling, combination of models and of modeling with sensors (soft sensors). Data mining and statistical models
- Industrial ecology projects and other "green" projects: substitution of fossil fuel by biomass, use of waste from other industries as secondary raw material, or fuel (or heat)
- Quite a bit of pilot work (not only modeling!!)







# Muchas gracias por su atención

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