SPIRE Pre-Brokerage event

21 September 2017

ENERGY AND RESOURCE FLEXIBILITY IN HIGHLY ENERGY INTENSIVE INDUSTRIES (IRON & STEEL INDUSTRY)

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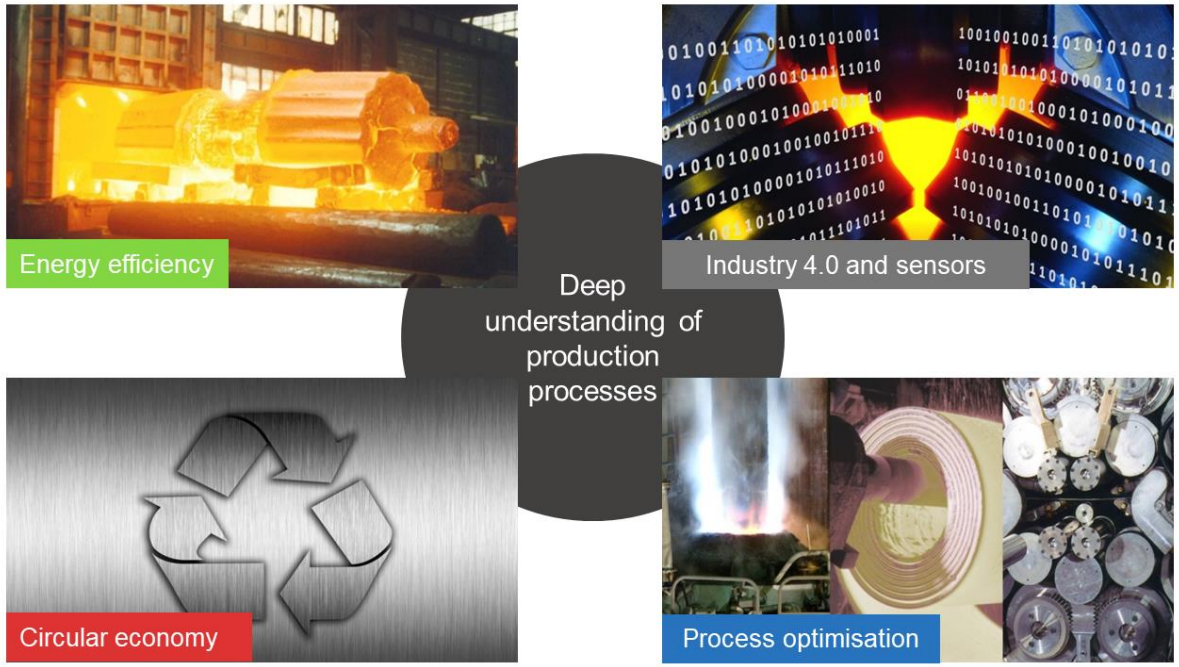
SPIRE
Sustainable Process Industry through Resource and Energy Efficiency

VDEh-Betriebsforschungsinstitut GmbH

BFI Excellence in Applied Research

- Private, non-profit making institute for applied research and development
- Located in Düsseldorf, Germany
- Leading provider of application-focused R&D in the **Iron & Steel industry**
- Short and medium term research originated by industrial production topics
- Large national and European network (research and industry)
- Staff of 100 people with very high academic degree



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CONTRIBUTION TO PROJECTS

CE-SPIRE-03-2018: Energy and resource flexibility in highly energy intensive industries

1. Heat and material recovery from metallurgical slags (contribution to increase of energy and resource efficiency)
2. Hybrid furnaces for flexible operation with electric power and conventional fuels (contribution to grid stabilization due to increasing use of renewable energy sources)
3. 3-D-print of ceramic high temperature heat exchanger modules (recuperator) for pre-heating of gaseous media (contribution to increase of energy efficiency)
4. Aerogel based refractory for efficient insulation in high temperature processes (contribution to increase of energy efficiency)

CONTRIBUTION TO PROJECTS

5. Application of microwave heating for slag pre-treatment
   e. g. comminution influencing material properties as magnetism
   (contribution to increase resource efficiency)
6. Inductive heated process for the recovery of Zn and Pb from steelwork residues (contribution to increase resource efficiency)
7. Inductive heated desorption and regeneration of activated carbon
   (contribution to increase resource efficiency)
8. Cross sectorial utilization of steelwork gases
   (utilization of cross sectoral synergies)
9. Cross sectorial utilization of secondary or/and modified raw materials from steel work waste streams and by-products
   (utilization of cross sectoral synergies)

EXPECTED IMPACT

(CE-SPIRE-03-2018)

- Significant increase of energy and resource efficiency
  - heat recovery (slag; ceramic heat exchanger)
  - recycling of by-products (slag)
- Increased flexibility of power consumption in a renewable electricity grid (hybrid furnaces)
- Symbiosis between industry sectors by cross sectoral utilization of energy and resources

EXISTING PROJECT CONSORTIUM

Iron & Steel industry is interested to contribute.

Ongoing discussions with industry partners.

LOOKING FOR PARTNERS

Partners complying with the project ideas and scopes are welcome.

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