RECOBA

- SPIRE I – 2014, g.a. 636820
- Start/end date: 01.01.2015 / 31.12.2017
- Partners:
Project Case Study

1. The EU/ SPIRE needs
   Increased efficiency of the considered batch processes for energy and raw material savings

2. The Project Solution
   Improved model based control and dynamic real-time optimization in combination with new in-line sensors

3. Value to Customers
   Producers will save energy and raw materials, increase production and reduce health and safety risks while maintaining product quality

4. How will this happen?
   - Innovative new sensors for online process monitoring (Raman spectroscopy, TEM, fiber-optic temperature)
   - Innovative process models
   - Nonlinear model-predictive control
Key expected sustainability impacts of RECOBA.

Cases:
- *Semi-batch emulsion copolymerization process (BASF)*
- *Liquid steelmaking process (TKSE)*
- *Silicon refining process (ELKEM)*

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Baseline</th>
<th>Expected Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Warming Potential</td>
<td>Estimated annual European production for the products in the three industry cases</td>
<td>Savings of about 1400 kt/a CO$_2$ in EU</td>
</tr>
<tr>
<td>(mainly CO2 emission reduction)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fossil energy intensity*</td>
<td></td>
<td>Estimated savings of about 930 GWh/a of energy consumption.</td>
</tr>
<tr>
<td>Total material consumption*</td>
<td></td>
<td>Yield increase of about 450 kt/a in the three industry cases possible.</td>
</tr>
</tbody>
</table>

*Core SPIRE indicator
Outputs and learning from RECOBA with value for other SPIRE projects

• The coordinated development of new sensors, mathematical models and model based control strategies has proven to be fruitful.
• The DynTemp® fibre-optical measurement system for continuous liquid metal temperature measurements is already on the market.
• New batch process control applications, based on nonlinear model predictive control, are ready for the market.
RECOBA: From cookbook to process optimization

Produce correct product quality at minimum time, with minimum materials and energy consumption and at minimum risk.

Liquid steelmaking

Emulsion copolymerization

Silicon refining
Contact

Project coordinator email: omar.naeem@basf.com

Exploitation manager email: peter.singstad@cybernetica.com

Project website: https://www.spire2030.eu/recoba
Workshop

TACKLING THE FUTURE OF PLANT OPERATION – JOINTLY TOWARDS A DIGITAL PROCESS INDUSTRY

13 - 14 December 2017
Barcelona - Spain

REGISTRATION OPEN:
http://www.tfpo.talkb2b.net/