Cross-sectorial real-time sensing, advanced control and optimisation of batch processes saving energy and raw materials

The RECOBA project aims to improve product quality, efficiency and flexibility of and in batch processes.

Ten cooperation partners will make use of an online, model predictive control of complex batch processes for the production of emulsion polymers, steel, and silicon metal through the application of new sensor technologies, process models and automation tools. The consortium will focus on three different material systems to demonstrate the cross-sectorial applicability of developed sensors, optimization and control methods, with the goal of optimizing product quality, energy consumption, raw materials utilization and production costs of the considered processes.

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Motivation

All companies of the European process industry are facing the same challenges: on the one hand product quality has to be improved and at the same time production costs have to be decreased to be competitive on the world market. On the other hand the resource and energy efficiency of products and processes has to be improved to lower their ecological footprint. This is independent of the industrial sector, it is true for the cement industry as well as for the food or copper industry. That means, these are cross-sectorial challenges!

The development of new production technologies could be one way to tackle this challenge. Examples are modularised processes in the chemical industries, new ways to reduce iron ore to liquid iron in steel industry or increasing the yield during refining of silicon industry. In reality, these are long term perspectives. However, the most promising medium term solution is the efficiency increase of technological processes in the process industry by improved and integrated process control solutions.

In many aspects batch processes are superior to continuous ones. Therefore it is worthwhile to take advantage of recent progress in sensor technologies, modelling and process control to develop a new paradigm for the design and operation of batch processes. The objective of the project is to maximise efficiency of batch processes regarding quality, energy, raw materials, costs.

Partners

The RECOBA consortium represents a selection of batch processes operating industries and partners across the value chain of batch process control. Among them are three **global players** from the polymer industry (BASF SE, Germany), the steel industry (ThyssenKrupp Steel Europe AG, Germany) and the silicon metal industry (ELKEM AS Technology, Norway).

Four **academic partners** (RWTH Aachen University, Germany, University of Cambridge, United Kingdom, University of Chemistry and Technology Prague, Czech Republic, University of the Basque Country UPV/EHU, Spain) possess leading scientific expertise covering material science, mathematical foundations of modelling, chemical reactions, computational and process systems engineering to provide purposive research strategies.

The **industrial development partners**, two SMEs (Cybernetica AS, Norway, MINKON Sp. z o.o., Poland) and one RTO (VDEh-Betriebsforschungsinstitut GmbH, Germany), provide applied research, sector knowledge and large-scale implementation experience for a wide range of measurement techniques, control systems and process automation.

Contact

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Acknowledgements

The research project receives funding from the European Community's Framework Programme for Research and Innovation Horizon 2020 (2014-2020) under grant agreement nº. 636820

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