



Coordinating Optimisation of Complex Industrial Processes



12 partners from 6 European countries (Finland, Sweden, Denmark, Germany, The Netherlands and Spain) covering several sectors of the industry: **steel, nutritional and materials products, automation technology providers, consultancy and software.**

The vision:

Complex process industry plants
will be optimally run by the operators with the
guidance of a coordinating, real-time optimisation system

General details

Project Start Date: 1st October 2016
Project End Date: 31th March 2020
Project duration: 42 months
Grant Agreement n.: 723661
Subprogramme area: SPIRE-02-2016,
H2020-IND-CE-2016-17
Web page: www.cocop-spire.eu
@CocopSpire

Contact Information

Prof. Matti VILKKO (matti.vilkko@tuni.fi)
Department of Automation
Science and Engineering
Tampere University
Finland

This project has received funding from the European
Union's Horizon 2020 research and innovation
programme under grant agreement No 723661



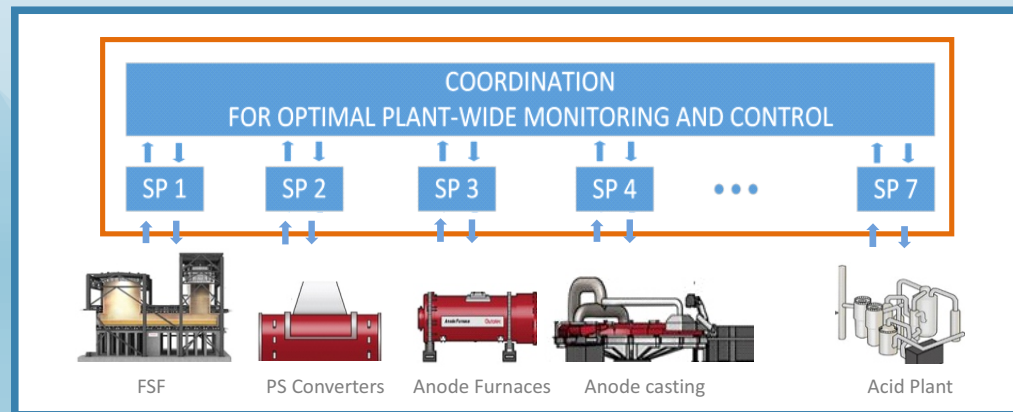
Need

Process industry faces a strong need to increase **product quality** and **reduce operating costs & environmental footprint**. A complex plant comprises continuous and/or batch unit processes, where the complexity stems from its dynamic properties, so a **plant-wide monitoring and control is needed**.

Objective

To achieve **plant-wide monitoring & control** by using the **model-based, predictive, coordinating optimisation** concept in integration with plant's automation systems.

- COOP is based on the **decomposition-coordination optimisation of the plant operations**: the overall problem is decomposed into unit-level sub-problems, and then, solutions of sub-problems are coordinated to plant-wide optimal operation using high-level coordination.



- COOP combines the technological development with a **social innovation process** of co-creation and co-development for improving effectiveness and impact of the innovations and operator acceptance

Benefits

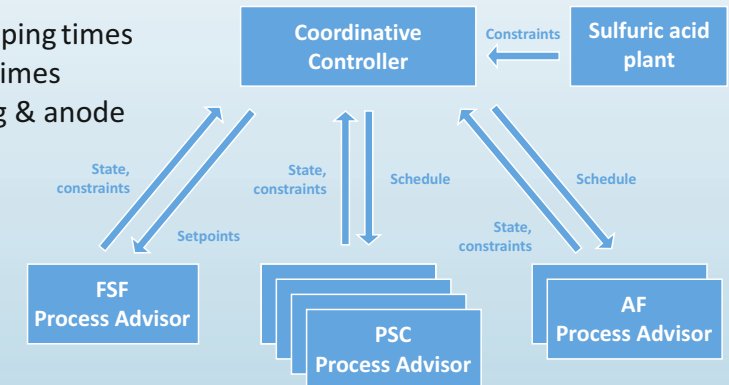
- Increased **product quality**
- Increased **productivity** and reduced operation **costs**
- Increased **sustainability** (reduced **energy and resource consumption** and decreased **greenhouse gas emissions**)
- Improved **working conditions** of plant operators
- Increased **competitiveness** of the European process industry

Copper pilot case

Goal: develop an advisory system for **plant wide scheduling of copper smelter** operations and for **optimizing the unit process** operations targeting decreases in emissions, improved metal recovery, increased production and increases in the life time of converter bricks.

- Scheduling:** the purpose is to give up-to-date forecast for different process sectors and visualize to the future what, where and when are produced:

- FSF matte tapping times
- PSC blowing times
- AF processing & anode casting times



PSC Advisor:

- Visualize the calculated process state to the operators: masses (matte, slag, blister), temperature and slag liquidus temperature estimate and compositions (Matte Fe-%, Slag Cu-% ja Fe/SiO₂).
- Calculate advise for next slag blowing step: blowing time, silica Flux amount and revert amount.

