Coordinating Optimisation of Complex Industrial Processes

Horizon 2020

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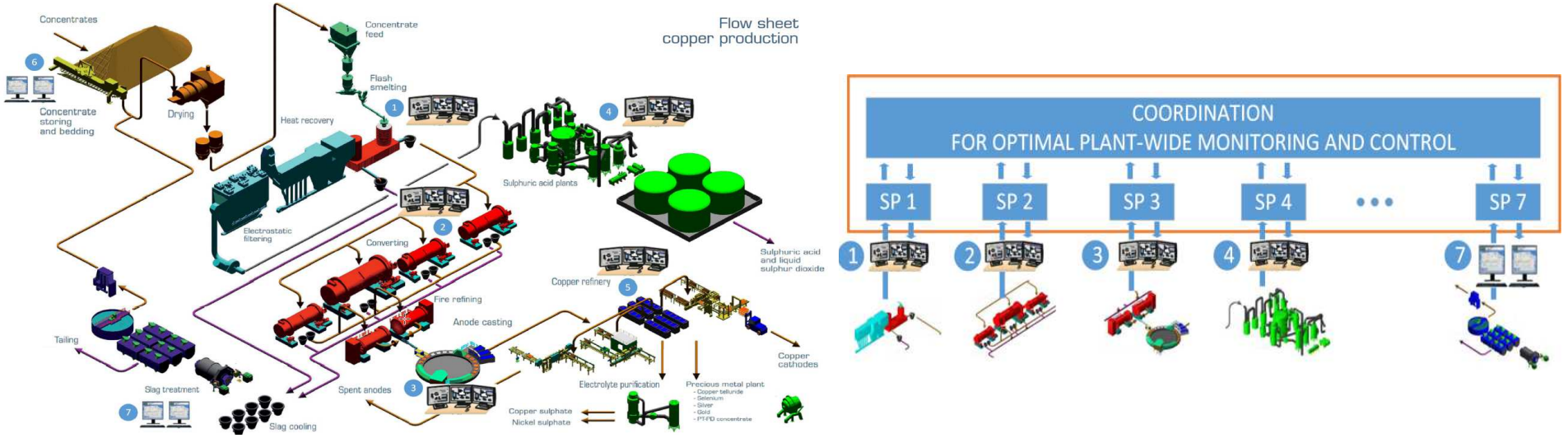
Motivation and Objectives

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. The plant's complexity stems from its dynamic properties, so a **plant-wide monitoring** and **control** is a requirement for achieving economically and environmentally efficient operation
Vision	Complex process industry plants will be optimally run by the operators with the guidance of a coordinating, real-time optimisation system
Objectives	**To enable plant-wide monitoring and control by using the model-based, predictive, coordinating optimisation concept in integration with local control systems**

Approach

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



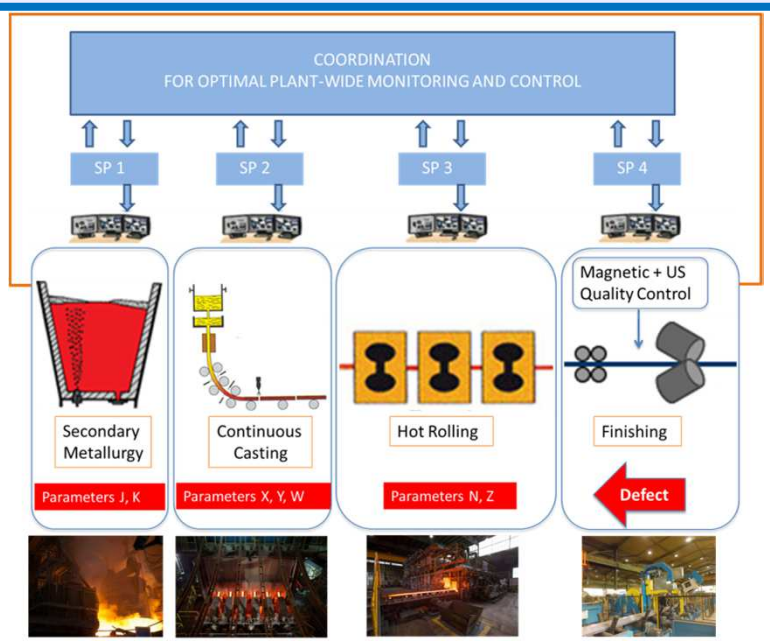
- COCOP will also combine the technological development with a **social innovation process** of co-creation and co-development for improving effectiveness and impact of the innovations and operator acceptance

Pilot Cases

- **On-site application and validation at two plants**

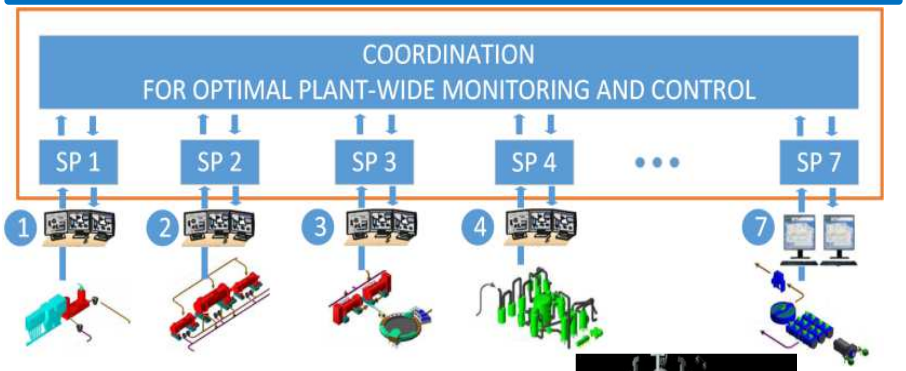
STEEL pilot case

- Development of a steel manufacturing plant-wide monitoring and control tool in order to **reduce the surface and sub-surface defects** in micro-alloyed steels in as-rolled state
- Addressed sub-processes: Secondary metallurgy, continuous casting and hot rolling



COPPER pilot case

- Development of advisory tools for controlling unit processes to **improve** factors such as **temperature, slag chemistry and impurities**
- The optimization will comprise of converter and anode-furnace scheduling & setting target matte grades and feed rates of flash-smelting furnaces



Flash Smelting Furnace

- **Transferability analysis** to other sectors: **chemical** & **water treatment processing**

Impact

- **Main Beneficiaries:** the main companies who can benefit from the COCOP´s results are:
  - **Process Industry:** Steel, Copper, Chemical, Cement, Glass**,..**
  - **Automation solution suppliers**

- **Main Benefits:** the use of the solution of the project will allow plant operators to **approach optimal production** and result in:
  - **Reduced** operation **costs**
  - Increased **sustainability** (**reduced energy and resource consumption** and decreased **greenhouse gas emissions)**
  - **Improved working conditions** of plant operators by the new process control tools which support the operating work
  - **Increased competitiveness** of the European process and automation industry, resulting in job retention, exportable high-value IT products for the industry and the corresponding jobs, and wellbeing in Europe

Consortium

- It consists of **12 partners** from 6 European countries (Finland, Sweden, Denmark, Germany, The Netherlands and Spain) covering the main areas involved in the proposal
- It is well balanced with both research and commercial organisations (5 research organisations and 7 companies, 4 of which are SMEs) covering several sectors of the industry: **steel**, **nutritional** and **materials products**, **automation technology providers**, **consultancy** and **software**

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General details

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- Project End Date: 31st March 2020
- Project duration: 42 months
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- Sub-programme area: SPIRE-02-2016, H2020-IND-CE-2016-17
- Web page: *www.cocop-spire.eu*
- *@CocopSpire*

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Thank you for your attention!

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