



MONSOON aims to establish a data-driven methodology to support the identification and exploitation of optimization potentials by applying multi-scale model based predictive controls in production processes.

CONCEPT

MONSOON is a 3-year SPIRE project that aims to create an infrastructure in support of the process industries. By monitoring and controlling the processes and depending on the scenario, the goal of MONSOON would be to identify a guided methodology from the output data, which can improve both the energy consumption and also the reuse of waste material at a low level of the process. Effective optimizations will also be identified and applied in the different levels present in the plant. In addition, the analysis of the use cases and scenarios will lead to the definition of dynamic models and will give rise to the concept of 'cross-sectorial data lab' - a collaborative environment in which large amounts of data from multiple sites are collected and processed in a scalable way. To test, validate and demonstrate the results of research, the project will use two real environments: an aluminium plant in France and a plastic factory in Portugal.

Start date: October 2016
End date: September 2019

IMPACTS

THE MAIN EXPECTED IMPACTS OF MONSOON

- Increase the productivity and the efficiency in the considered industrial scenarios
- Decrease the resource consumption and use of energy
- Improve the environmental efficiency, by decreasing the emissions
- Enhance the safety, by decreasing the accident rate



PARTNERS

Companies ■
Research Institutes / University ■

The MONSOON Consortium is made of 11 partners from 7 EU countries, representing a wide taste of Europe in terms of population, culture and economic power, including partners from Central, West, East and South Europe. MONSOON brings together 3 research institutes and 1 university, a team of 6 companies with strong R&I capacities (3 of which SMEs) and 1 non-profit organization.



CONTACTS

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MOdel based
coNtrol framework for
Site-wide OptimizatiON
of data-intensive
processes

MAIN OBJECTIVES

An effective multi-scale control methodology suitable for plant- and site-wide applications in heterogeneous production environments to improve process efficiency and reduce usage of resources

An integrated real-time and dependable infrastructure easing adaptation of heterogeneous systems in monitoring and control of data-intensive production processes

Distributed plant- and site-wide models and mapping techniques

Application of data-driven processing techniques suitable to support real-time control

Research and develop innovative, multi-level, plant-wide Analytics and Visualizations for the detection of complex patterns in plants processes

A novel model based development environment to facilitate design, development, integration, deployment and testing of predictive control algorithms

Symmetric plant and site-wide Life Cycle Management Tools integrated with the existing control infrastructure

Demonstration in two plants: one plastic plant in Portugal and one aluminium plant in France

Implement a cross sectorial Data Lab to build Predictive Functions based on Big Data Analytics tools to optimize the production processes

Develop a plant operations platform to deploy these Predictive Functions in real-time



MONSOON HIGH-LEVEL VISION



The MONSOON Application Domains

ALUMINIUM

Aluminium Pechiney Company is a world leader in aluminium production and the French subsidiary of Rio Tinto Aluminium. Aluminium Pechiney has worked for more than 40 years on the development of electrolysis process equipment, process control, manufacturing execution and advanced data analysis and has proposed its Dunkerque plant as an indicative use case as there is an intensive need for plant-wide monitoring within its aluminium production, carbon and potline process.

MAIN FOCUS IN MONSOON: enable shared "Process Excellence Centers" to analyze large volume of available data from multiple shared pot-lines at supervision level.

OUTCOMES

- Detecting and managing the outlier pots
- Providing early warnings or even predictive signals on global or individual anomalies
- Enabling a better analysis of the root cause of the abnormal behavior
- Detecting common trends between pot-lines, that could be related to e.g. common raw materials supply, etc.

PLASTIC

GLN Plast dedicates its activity to the injection thermoplastic components for use in various and diverse segments (automotive, pharmaceutical, medical, electronic, cosmetic, food packaging). GLN Plast is a member of a larger industrial group, named GLN Group, which incorporates three companies, all tied to the molding and plastic industry. This association provides GLN Plast with far reaching knowledge of the sector and production technologies.

MAIN FOCUS IN MONSOON: enable plant managers to optimize injection molding processes (e.g. reducing defects rate) by leveraging analysis high-volume data from additional sensors.

OUTCOMES

- Real-time analysis of data from injection moulding sensors
- Cross-correlation of data from field sensors and ERP systems
- Multi-variable optimization of specific production processes