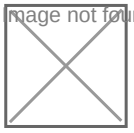
CoPro: Optimisation of the operation of an industrial power plant under demand uncertainty

Project:
Improved energy and resource efficiency by better coordination of production in the process industries



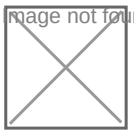
The goal of the CoPro project was to develop and to demonstrate methods and tools for process monitoring and optimal dynamic planning, scheduling and control of plants, industrial sites and clusters under dynamic market conditions, to provide decision support to operators and managers and to progress to automated closed-loop solutions to achieve an optimally energy and resource efficient production.

CoPro brought together 17 partners from 8 EU countries, including 5 industrial end users and 6 technology providing SMEs. The project developed solutions for the **plant-wide optimisation of large plants, for balancing production and consumption in industrial parks for industrial symbiosis**, and addressed **power plant scheduling** and **demand-side response**. It further developed online data analytics for **anomaly detection**, and **decision support** for plant operators and managers. The solutions can be integrated into the IT infrastructure of the plants via an **integration platform** that supports the connection to different IT systems. CoPro developed **model libraries** for the efficient development of advanced optimisation-based solutions and techniques and software for **hybrid modelling** and **model management**.

The developments of CoPro were motivated by and applied to challenging use cases from different sectors of the process industries:

- (Petro-)chemical production;
- Cellulose fiber production;
- Production, formulation and packaging of consumer goods;
- Sterilisation and packaging of food.

CoPro demonstrated that significant savings of energy and resources are possible by using advanced technologies for monitoring, decision support, optimisation, and planning and scheduling.



Sector:

Chemicals

found or type unknown

Steel

Summary:

The Problem

- INEOS in Köln operates a power plant that incinerates off-gases of the production plants and produces steam and a part of the electricity that is required for plant operation.
- The steam demand of the site depends on the operation of the plants which is exposed to uncertainties.
- An imbalance in the steam network results in inefficient operation of the power plant.

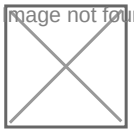
The Solution

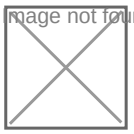
- A framework for the optimal operation planning of the power plant considering uncertainties in the steam demand has been developed.
- The plan is re-calculated on a rolling horizon, and the model parameters and the scenarios for the future steam demand are updated based on the most recent information from the plants.
- The uncertainty-aware solution reduces the adverse effects of the uncertain steam demand.

Theme:
Plant-wide monitoring - SPIRE02-2016
Keywords:
Combined heat and power plants, Steam demand uncertainty, Scheduling, Stochastic optimisation, Optimisation on a moving horizon, Dynamic electricity price
Type:
Case study
Software
Poster

Resources

Link:
Technology Short Desc.: Optimisation operation of an industrial power plant under demand uncertainty





Complementary Material:

Poster: Power plant scheduling under uncertainty

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