ITN ENERGY-SMARTOPS WORKSHOP "Optimization to provide energy savings by better integration of operations across the process-mechanical-electrical interfaces", LADENBURG, GERMANY, 22-24 Oct 2013.

MARIE CURIE ACTIONS

Energy-SmartOps

Integrated Control and Operation of Process, Rotating Machinery and Electrical Equipment

Energy Savings by Integrated Production in Stainless Steel Industry

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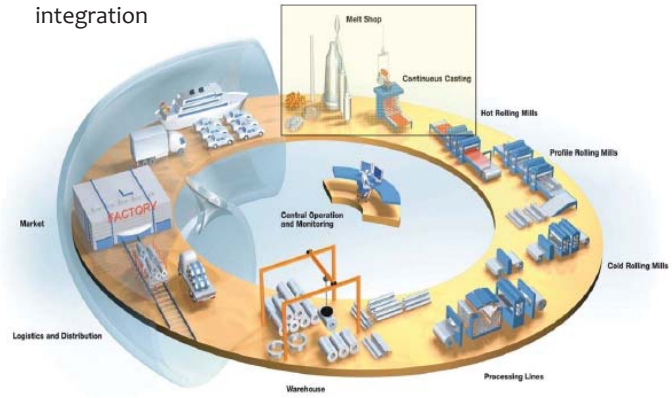
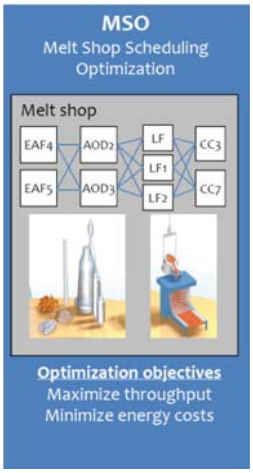
My Project in Energy-SmartOps

- To develop, test and implement creative solutions for **energy (cost) savings** in stainless steel industry focusing mostly on melt shop and hot rolling mill area, as well as their integration



Problem statement

- **Optimize** grouping, assignment, sequencing and timing of production batches, i.e. heats, to ensure continuous caster feed
- **Minimize** make span, hold-up times and energy losses
- **Integrate** different production processes and
- **Coordinate** those with energy demand as well as hot rolling mill in order to increase ratio of hot charged slabs



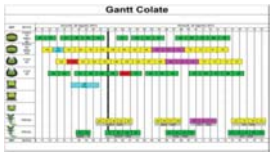
Methodology

- Interviews
- Data mining
- Modelling
- Optimization (MILP)
- HMI development
- Testing and implementation in a real production environment
- Customization
- Integration with other plant IT systems (e.g. PCS, EMS, HSO)

Results - Production scheduling (r)evolution

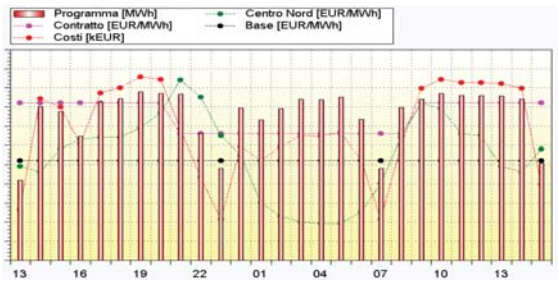
- **Past**
  - Paper and pen
  - A big (re)scheduling effort
  - Limited accessibility and storage
  - Standalone
  - Short-term (up to 2 days)

- **Now**
  - PC software
  - Reduced (re)scheduling effort
  - Plant-wide accessibility
  - Integration with other IT systems
  - Both short- and medium-term
  - Automation and optimization
  - Energy awareness

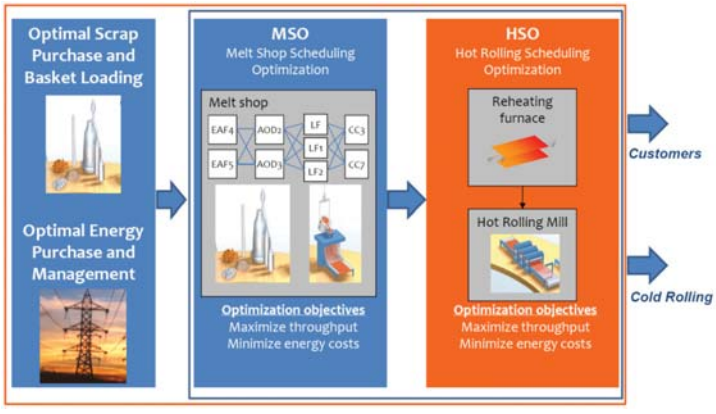


Conclusions

- Increase in throughput up to 5%
- Reduction in energy costs up to 10%
- Reduction in hold-up times, i.e. energy losses, up to 10%



Future Work - Further Integration



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