Work package 5 in Energy-Smartops

**Aim:** Deliver technology prototypes for energy/cost savings at the scale of production processes:
- By developing and implementing scheduling optimization methods to integrate the production
- By developing a framework and methods for demand response of energy-intensive processes

**Expected outcome and benefits:**
- Deal with increasing volatility in production, energy, and raw material availability
- Bridge the gap between production, energy management and maintenance
- Enable energy and cost savings through optimization

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**ENERGY SMARTOPS**

**Production scheduling optimization in the stainless steel industry**

- Develop, test and implement creative solutions for energy (cost) savings in stainless steel industry focusing on melt shop and hot rolling mill area
- Meltpool scheduling:
  - Optimal grouping, assignment, sequencing and timing of heats
  - Ensure continuous caster feed
  - Minimize production makespan, thus waiting times and energy consumption
  - Considering maintenance tasks and energy purchase strategy
- Integration with other plant IT systems and real-time monitoring

**Optimal coordination between meltpool and rolling mill in a steel plant**

- Reduce waiting times in inventory to save reheating energy
- Integration of the scheduling across the steel plant to provide a centralized order management workflow
- Reuse and control existing scheduling systems
- Direct natural gas savings potential

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**Electricity demand-side management in process plants**

- Extension of continuous-time scheduling models with energy-awareness
- Optimization of complex time-sensitive electricity price structures and load deviation problem within continuous and discrete-time scheduling approaches
- Functional decomposition of production and energy optimization aspects
- Application to stainless steel Meltpool and evaluation of Thermo-mechanical Pulping Mill

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Energy-SmartOps consortium investigates equipment and process monitoring, integrated automation and optimization for energy savings. http://www.energy-smartops.eu/