CoPro – Improved energy and resource efficiency by better coordination of production in the process industries

- Call: SPIRE-02-2016
- November, 1st 2016 – April, 30th 2020
- 17 partners from 8 countries
Contributions of the Project

1. The EU/ SPIRE needs
Improving energy and resource efficiency of production plants and chemical parks or clusters

2. The Project Solution
Methods and tools for
- process monitoring and optimal dynamic planning,
- scheduling and control of plants, industrial sites and clusters under dynamic market conditions
Decision support to operators and managers, heading for automated closed-loop solutions

3. Value to Customers
- Reduced environmental impact of production processes
- Reduced cost of energy & resources
- By better coordination and control (no investments into equipment)
- Improved transparency
- Coordination in chemical parks

4. How will this happen?
- Examples of use cases
- Algorithms and software
- Consultancy and engineering of solutions by SMEs
- Standardisation activities
CoPro Industrial Use Cases

• Coordination of the operation of the plants in a petrochemical site (INEOS)
  • Including shut-down and ramp-up of units or sub-units
  • Including demand side response

• Optimal operation of the production and consumption of gases in an integrated site (Covestro)

• Coordination of production units in an industrial park (Worringen/Dormagen Chempark)
  • By market-like distributed algorithms

• Spin bath recovery in cellulose fibre production (Lenzing)
  • Reducing energy demand by optimized operation and use of equipment

• Production, formulation and packaging of detergents (P&G)
  • Prediction of the need for and scheduling of maintenance
  • Optimized changeovers

• Sterilization and packaging of food (FRINSA)
  • Optimization of thermal processes
  • Coordination of the units and optimizing the flow of material
What are the **key expected sustainability impacts** of *CoPro*?

**Estimated impacts for broad deployment by 2030 (relative to 2015)**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Expected Impact</th>
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<tbody>
<tr>
<td>Reduction in greenhouse gas (GHG) emissions</td>
<td>4%</td>
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<tr>
<td>Reduction of the use of energy from non-renewable sources</td>
<td>2-10%</td>
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<td>Waste minimization (in specific cases)</td>
<td>25%</td>
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<tr>
<td>Reduction of fresh water consumption (where applicable)</td>
<td>10%</td>
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<tr>
<td>Heading towards industrial symbiosis</td>
<td>too early to quantify</td>
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What are the **key expected innovations** of CoPro?

<table>
<thead>
<tr>
<th>Innovations</th>
<th>Baseline TRL</th>
<th>Expected TRL</th>
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<tbody>
<tr>
<td>Tools for plant-wide optimization including DSM</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Tools for coordination in industrial parks</td>
<td>2</td>
<td>5</td>
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<tr>
<td>Tools for more efficient modelling</td>
<td>2</td>
<td>5</td>
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<tr>
<td>Technology for optimizing changeovers</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Reactive planning and scheduling technology, including scheduling of maintenance</td>
<td>3</td>
<td>6</td>
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<tr>
<td>Tools for online data analytics, detection of anomalies, prediction of time to failure</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Novel forms of information presentation to operators and managers</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Integration and deployment platform</td>
<td>4</td>
<td>6</td>
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Better coordination of production means improved energy and resource efficiency.

Individual units often are already automated and operated efficiently.

Inefficiencies result from lack of coordination.
Contacts

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