PROPAT: Robust and affordable process control technologies for improving standards and optimising industrial operations

- SPIRE-01-2014: Integrated Process Control
- Jan 2015 – Dec 2018
- 16 Partners
1. The EU/ SPIRE needs

1. Strengthen competitiveness and maintain global leadership
2. Increase resource and energy efficiency
3. Reduce environmental impact.

SPIRE goal: 20% less non-renewable raw material usage

2. The Project Solution

A unified PAT solution able to integrate multiple sensors and analysers installed within and across processes. ProPAT is capable of data acquisition, processing, mining, and visualization in real-time thus providing recommendations (decision support) or direct process control (closed loop control).

3. Value to Customers

Simplicity: Single solution for end-to-end process control
Flexibility: Able to connect to existing systems and adapt to process changes
Cost: Allows replacement of expensive and bulky analysers with low-cost and small sensors
Savings: Higher resource efficiency through real-time end-to-end control

4. How will this happen?

Application, demonstration, and standardization across SPIRE industries (Ceramics, Chemicals, Metals, Pharma, and more)
What are the **key expected sustainability impacts** of **PROPAT**?

**Baseline:** This table presents sustainability impacts from the deployment of ProPAT technologies in process industries that still operate with offline and/or post-production quality control paradigms.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Means of achieving impact</th>
<th>Expected Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in productivity</td>
<td>reduction in cycle time and yield increase</td>
<td><strong>20-40% increase in productivity</strong></td>
</tr>
<tr>
<td>Energy intensity</td>
<td>Reduction in cycle time and off-spec batches</td>
<td>10%-40% energy savings</td>
</tr>
<tr>
<td>Total material consumption*</td>
<td>by reduction of scrap and off-spec batches</td>
<td>20% reduction in non-renewable raw material</td>
</tr>
<tr>
<td>fossil fuel intensity</td>
<td>optimum process conditions and cycle time</td>
<td>Up to 30% reduction in fossil fuel per unit of output</td>
</tr>
<tr>
<td>CO2 equivalent footprint</td>
<td>Following above achievements</td>
<td>Up to 40% reduction</td>
</tr>
<tr>
<td>Job creation</td>
<td>Assuming 3% market penetration and 1% increase in turnover</td>
<td><strong>2000 new Jobs by 2030</strong></td>
</tr>
</tbody>
</table>

*Core SPIRE indicator

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What outputs or learning from Project X could have value for other SPIRE projects here?

- PAT integration is a challenging but not impossible task.
- **Single biggest challenge:** industrial integration of online and inline solutions in infrastructure that often exceeds 30 or even 50 years of age
- However, **data collection and availability is not a blocker.** We are collecting more than we can use!
- The challenge is putting data together and deriving useful knowledge
- Creating common solutions across diverse industries has the added benefit of innovation and problem-solving through domain transfer
**ProPAT project at a glance:**
Scale up next generation low cost analysers and smart sensors to enable affordable real-time process monitoring

**Develop a versatile PAT software platform** for seamless integration of all commercially available systems

Provide connectivity, interface with users, and complete data management

**Validate the ProPAT development in the laboratory.**
Develop and validate in four industrial case studies (pharmaceutical, polymers, minerals and ceramics).

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