Session Title: Modelling and Optimization of Industrial Systems to increase sustainability

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Abstract

Sustainability has become a global priority. Even industrial systems, often associated with energy-intensive processes and significant environmental impacts, are being called upon to transform towards more sustainable practices to reduce environmental impact, improve energy efficiency and contribute to the achievement of the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda.

Automation, digitisation and process optimisation play a key role in this regard. For example, companies are implementing advanced technologies to optimise operational efficiency, reduce waste, and use renewable energy. Much research points to the evaluation of alternative packaging, choosing less impactful, recyclable and recycled materials in their production processes. At the same time, efforts are made to extend the lifespan of products by offering better maintenance or reparation with a view to the circular economy. In logistics, the focus is on space optimisation and more sustainable practices for product delivery and transport. All this is possible by promoting a culture focused on sustainability, investing in staff training on environmentally friendly practices and the responsible use of resources.

In this context, this session aims to investigate, assess, and examine the challenges and opportunities of modelling and optimizing processes in the industrial systems, trying to improve their sustainability. Potential topics and research include, but are not limited to:

- Energy consumption reduction
- Greenhouse gas emissions calculation and reduction
- Waste and scraps optimization
- Improvements in production flexibility, productivity, customization
- Industrial symbiosis
- Life Cycle Assessment (LCA) related to industrial systems
- Social Life Cycle Assessment (S-LCA) related to industrial systems
- Life Cycle Costing (LCC) related to industrial systems