



International

*Innovation in Knowledge Based and Intelligent
Engineering Systems*



INVITED SESSION SUMMARY

Title of Session:

Innovation for Sustainable, Circular and Symbiotic Transformations

Name, Title and Affiliation of Chair:

Prof. Marco Bortolini, Professor of Industrial Systems Engineering, Alma Mater Studiorum - University of Bologna, Italy

Prof. Minna Lammi, Professor of Sustainability, Anglia Ruskin University, UK

Details of Session (including aim and scope):

Innovations are at the core of businesses and societal transformations, including sustainable and Circular Economy (CE) transformations. These transformations must be understood systemically—across businesses, industrial ecosystems, and wider economies. Industrial symbiosis plays a key role in this systemic view by enabling collaboration between firms, sectors, and regions to share resources, by-products and info, creating new forms of sustainable value. Such symbiotic interactions expand the scope of innovation beyond individual organisations toward network-level and regional transformations.

However, achieving sustainability and CE transformations requires changes not only in technologies and production systems but also in societal values, norms, and behaviours. Yet, aspects of the enabling systems that shape these transitions are often neglected—particularly the social and human dimensions of industrial and organisational change. These include leadership for transformation within companies, the role of intermediaries, job market implications, cross-sector networks and trust-building, training and skills for circular and symbiotic practices, emotional responses to change, and consumer behaviour and acceptance of sustainable solutions.

Furthermore, research in this area needs to increase attention on the practical implementation of sustainability, CE, and industrial symbiosis to support the scaling of transformations and achieve higher impact. In this special session, we aim to explore different angles of sustainability and CE transformations, including the emergence and governance of industrial symbiosis systems, and connect these to the role of innovation.

The session covers (but is not limited to) the following topics:

- Eco-innovation role in sustainability/CE transformations
- Elements in industrial symbiosis and how to make them successful
- Sustainable/Circular business models and markets
- Industrial/Entrepreneurial/Innovation ecosystems role in sustainable/CE transformations
- Design approaches and innovative processes to enable sustainable/circular practices

- Technological innovation and development to support the sustainable/CE transition
- Challenges and barriers hindering sustainable/CE innovation
- Managerial aspects of innovation and business practices
- Models, methods and case histories to support the spread of industrial symbiosis practices
- Multi-goal approaches joining technical excellence and economic feasibility to green and social sustainability in CE transformations and industrial symbiosis networks
- Energy symbiosis in industrial clusters and eco-industrial parks
- Uncertainty and risk in industrial symbiosis network design and operations

Contributions of any type are welcomed, including empirical research, literature reviews, conceptual, case studies and surveys.

Authors' guidelines, and deadline for submissions can be found on the conference website.

Main Contributing Researchers / Research Centres (tentative, if known at this stage):

Researchers and Professors from the Italian Academic Industrial Plant Association

Researchers and Professors from Universities in partnership with Bologna University (tentative)

Researchers from Interdepartmental Centres for Industrial and Applied Research (tentative)

Website URL of Call for Papers (if any):

<https://www.unibo.it/sitoweb/marco.bortolini3/en>

<http://www.industrial-engineering.unibo.it/en>

and dedicated messages to researchers and practitioners mailing lists.

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