

Pro²Future 4th Scientific Symposium on
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**From Ambition to Implementation:
Advancing Circular and Sustainable Industry**

ABSTRACT

Despite more than three decades of strategic emphasis, the transition toward a sustainable, circular, carbon-neutral, and human-centered industry continues to lag behind political targets and societal expectations. While circular manufacturing is widely acknowledged as a critical enabler of sustainable industrial systems, current circularity rates show only marginal improvement.

This presentation examines key technological, economic, and organizational barriers that hinder the large-scale industrialization of circular manufacturing, with particular attention to the often-overlooked challenges associated with its less visible or “dark” operational aspects. It further presents selected industrial case studies that demonstrate pathways for establishing economically competitive and environmentally sustainable circular processes.

In addition, the role of adaptive work systems in addressing demographic change is analyzed, highlighting their contribution to resilient and sustainable industrial operations. These aspects are discussed within an integrated framework that connects workforce transformation with broader sustainability objectives in industry.

SHORT BIO

Sebastian Schlund is Full Professor at the Institute of Management Science at TU Wien and CEO of Fraunhofer Austria Research GmbH, which operates the centers “Sustainable Manufacturing and Logistics” and “Data-Driven Design.” With an interdisciplinary background in engineering, his work focuses on the development of sustainable work systems in manufacturing and logistics, spanning scales from individual workplaces to complex value networks.

He began his academic career in systematic product development before transitioning to ergonomics/human factors and industrial engineering. His current research addresses applied artificial intelligence, circular manufacturing, end-of-life management, automated disassembly, and adaptive work systems, including human activity recognition and dynamic task allocation.

His work has been widely published in leading journals and conferences across industrial engineering, production technology, management, and human factors/ergonomics. He represents Fraunhofer Austria in the International Academy for Production Engineering (CIRP) and serves as a board member of the German Human Factors and Ergonomics Society (GfA), among other scientific organizations.

He holds a PhD in engineering (Dr.-Ing.) from the University of Wuppertal and has held postdoctoral positions at the University of Stuttgart and the Fraunhofer Institute for Industrial Engineering.