



IEEE PES

Hybrid Seminar

November 25, 2025, 10:30 (CEST)

**Università degli Studi di Cagliari - Facoltà di Ingegneria e Architettura
Via Marengo 3, Edificio I – Aula IAI_2D ex Aula Q**

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Registration

Net-Zero Energy Factories: how digitalization can support new business models

This seminar explores the concept of Net-Zero Energy Factories (NZEFs) and the role of digitalization in enabling innovative business models for sustainable industrial production. Emphasizing small and medium-sized enterprises (SMEs), the presentation examines how to integrate renewable energy generated on-site—such as photovoltaics—directly into manufacturing processes. By exploiting industrial process flexibility, combined with energy storage systems and electric vehicle charging, factories can significantly increase self-consumption of renewable energy while reducing operational costs. A central focus is on the deployment of blockchain technology to enhance transparency, traceability, and trust in energy use and sustainability claims. This creates new economic opportunities through verified green production, supporting premium pricing and closer engagement with environmentally conscious customers. The seminar includes practical insights from a German carpentry factory case study, illustrating how digital monitoring, control systems, and blockchain-enabled transparency facilitate flexible, sustainable production. Furthermore, the concept of Industrial Renewable Energy Communities is introduced, demonstrating how collaborative energy sharing and digital trust mechanisms among industrial partners boost resilience and competitiveness. Attendees will gain a clear understanding of how NZEFs, empowered by digital transformation and innovative flexibility strategies, offer SMEs a viable path to contribute to decarbonization while unlocking new business potentials in a rapidly evolving energy landscape.



Dr. -Eng. Pio Alessandro Lombardi is a senior researcher and project leader specializing in renewable energy systems and industrial decarbonization. With over 15 years of experience, he has developed expertise in Net-Zero Energy concepts, multi-vector energy systems, microgrid optimization, and energy storage technologies. He coordinates international R&D projects and contributes as an EU expert evaluator. Author of more than 100 scientific papers and co-author of a Springer book on energy storage, he actively participates in CIGRE and ETIP-SNET working groups. Fluent in English and German, he combines technical excellence with strong leadership in advancing sustainable energy solutions.

Remote Participation (MS Teams)

[Seminario Net-Zero Energy Factories: how digitalization can support new business models | Partecipazione alla riunione | Microsoft Teams](#)