

**Title of the Invited Session:**  
**Net-Zero Resources Factories: Blockchain and Circular Economy for Industrial Sustainability**

**Organized by:**

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**Abstract:**

The global push for sustainability is reshaping industrial practices, with a focus on minimizing resource consumption and reducing environmental impact. This invited session will delve into the innovative integration of blockchain technology and circular economy principles, which together provide a pathway toward the realization of Net-Zero Resources Factories (NZRFs). NZRFs aim to achieve a balance between resource consumption and regeneration by incorporating renewable energy, reducing waste, and optimizing resource efficiency through reuse and recycling. By utilizing blockchain, these factories can ensure greater transparency, traceability, and accountability in managing their energy, water, and material flows, while also improving collaboration across supply chains.

The session will feature presentations on cutting-edge methodologies for designing blockchain networks specifically tailored to support NZRFs, highlighting how these technologies can enhance operational sustainability in industrial settings. Topics will include the use of blockchain for ensuring compliance with circular economy principles, improving supply chain transparency, and optimizing resource flows in real time. In addition, the role of advanced digital technologies such as IoT, artificial intelligence (AI), and machine learning (ML) in improving resource use, reducing energy waste, and increasing overall sustainability will be explored.

Moreover, the session will offer insight into how blockchain and circular economy principles can be applied to overcome the specific challenges faced by industries striving for net-zero resource consumption. Attendees will gain an understanding of how these technologies can be strategically leveraged to optimize resource management and support long-term sustainability objectives. The discussion will also include practical insights into scalability, cross-sector applications, and future opportunities for development within Net-Zero Resources Factories.

**Topics of interest include, but are not limited to:**

- Blockchain network architectures and their application in Net-Zero Resources Factories
- Enhancing transparency, traceability, and accountability in sustainable resource management
- Integration of renewable energy and circular economy solutions in industrial systems
- Digital technologies (IoT, AI, ML) for optimizing resource use and efficiency in NZRFs

- Real-world case studies on the implementation of blockchain and circular economy strategies

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