



Special Session Proposal

Special Session Title

Advances in the energy transition: efficient buildings and sustainable industrial processes

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Abstract

This special session aims to gather contributions addressing energy efficiency as a key regional response to global energy, climate and socio-economic challenges, with a focus on both the building sector and industrial products and processes. In the context of the European Green Deal and the evolving policy framework on energy and climate, energy efficiency is increasingly recognised as a cross-cutting driver of decarbonisation, competitiveness, resilience and social well-being, with strong territorial and spatial implications.

Energy efficiency in buildings and the built environment

Contributions are invited on innovative approaches, tools and applications aimed at enhancing energy efficiency in residential and tertiary buildings, with particular attention to their integration within urban and regional systems. Topics include, but are not limited to:



- Integrated and replicable strategies for the retrofit and valorisation of the existing building stock, including historic buildings;
- Energy and environmental assessment frameworks supporting new minimum performance standards and the implementation of energy-environmental protocols and minimum environmental criteria;
- Sustainable and innovative construction materials and their impacts on energy performance and resource efficiency;
- Solutions to increase energy autonomy, flexibility and demand-side management in urban and energy-isolated contexts;
- Innovative configurations and technologies for low-temperature district heating networks, including thermal storage and bidirectional energy exchange;
- Analysis of the multiple co-benefits of energy efficiency interventions, such as health improvements, reduction of energy poverty and enhanced end-user awareness, including through indicators such as the Smart Readiness Indicator.

Energy efficiency of industrial products and processes

The session also welcomes contributions focused on improving energy efficiency and supporting the energy transition of industrial systems, with a particular emphasis on regional production structures, value chains and industrial districts. Topics include, but are not limited to:

- Energy efficiency and decarbonisation of industrial thermal processes, including waste heat recovery and innovative non-conventional technologies;
- Analysis of energy consumption patterns and efficiency potential in industrial clusters, supply chains and emerging production models;
- Tools, methods and impact assessments of technologies and practices supporting energy efficiency and energy transition in industrial sectors;
- Valorisation of agro-industrial, industrial and municipal waste and by-products;
- Energy efficiency in the water-energy nexus and in energy generation, transmission and distribution systems;
- Strategic and policy-oriented analyses supporting industrial decarbonisation pathways, including hard-to-abate sectors, the role of sustainable finance and the transition towards new industrial policy frameworks.

The special session encourages interdisciplinary and spatially explicit contributions, including empirical studies, modelling approaches, policy evaluations and case studies, that highlight how energy efficiency can act as a place-based solution to global transition challenges.