

## Special Issue

# AI-Driven Sustainable Energy Systems: Smart Grids, Homeostatic Control, and Distributed Resource Optimization

### Message from the Guest Editor

This Special Issue seeks high-quality theoretical, methodological, and applied contributions that explore AI-based solutions for sustainable, intelligent, and resilient energy systems. Particular emphasis is placed on energy homeostasis and homeostatic control mechanisms, distributed intelligence, and scalable optimization frameworks capable of supporting the energy transition while ensuring reliability, affordability, and environmental sustainability. Topics include, but are not limited to, the following:

- AI-based control and optimization in smart grids;
- Machine learning for anomaly detection and fault diagnosis;
- Homeostatic and self-healing grid architectures;
- Virtual Power Plants (VPPs) and distributed resource coordination;
- Reinforcement learning for energy dispatch and demand response;
- Cyber-physical systems and grid resilience;
- AI-driven forecasting for renewable integration;
- Edge computing and distributed intelligence in power systems;
- Multi-agent systems for energy management;
- Sustainable energy market design supported by AI.

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### Guest Editor

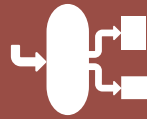
Prof. Dr. Franco F. Yanine

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### Deadline for manuscript submissions

30 October 2026



## Processes

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