Special Issue

HVAC System: Load Forecasting, System Modeling, Optimal Control and Flexible Interaction

Message from the Guest Editors

As a critical contributor to energy consumption and carbon emissions in buildings and industrial sectors, HVAC systems play a pivotal role in advancing sustainability through enhanced energy conservation and decarbonization capabilities. Driven by advancements in load forecasting, system modeling, and optimal control technologies, HVAC systems are accelerating their transition toward digitized and intelligent operational paradigms. Notably, through deep operational integration with building structures, pipeline networks, and industrial processes, modern HVAC systems are transcending their conventional role as passive energy consumers. By leveraging thermal inertia for flexible grid interaction, these systems are evolving into energy hubs equipped with bidirectional regulation capabilities, marking a fundamental shift from energy-intensive operations to dynamic energy management architectures. This Special Issue aims to present and disseminate the most recent advances related to the theory, design, modeling, application, control, and flexible interaction of all types of HVAC systems.

Guest Editors

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Message from the Editor-in-Chief

Energies is an international, open access journal in energy engineering and research. The journal publishes original papers, review articles, technical notes, and letters. Authors are encouraged to submit manuscripts which bridge the gaps between research, development and implementation. The journal provides a forum for information on research, innovation, and demonstration in the areas of energy conversion and conservation, the optimal use of energy resources, optimization of energy processes, mitigation of environmental pollutants, and sustainable energy systems.

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