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Flexible Interaction between Buildings and Power Grid

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Message from the Guest Editors

Dear Colleagues,

Today's power system, with significant use of renewable energies, is confronted with a lack of flexible control options. At the same time, buildings contain many flexible resources such as air conditioning systems, cooling/heating storage, and electric vehicles. However, the difficulties involved in building modeling, integration, optimization, and interaction with the power grid limit the efficient and flexible operation of building energy systems, as well as flexible interactions between buildings and power grids.

- Definition of building flexibility;
- Quantification of building flexibility potential;
- Interaction mechanism between buildings and power grids;
- Modeling and calibration of building energy systems;
- Optimal scheduling of building multi-energy systems;
- Control methods of building energy systems;
- Optimal design of flexible building energy systems;
- V2H, V2B, B2V and other technologies;
- Prediction of building cooling, heating and electrical load;
- Active and passive building envelope;
- Methods for integrating renewable energy within buildings.

Guest Editors

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Special Issue

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Message from the Editor-in-Chief

Current urban environments are home to multi-modal transit systems, extensive energy grids, a building stock, and integrated services. Sprawling neighborhoods are composed of buildings that accommodate living and working quarters. However, it is expected that the cities and communities of the future will face complex and enormous challenges, including maintenance, interconnectivity, resilience, energy efficiency, and sustainability issues, to name but a few. A smart city uses advanced technologies and a digital infrastructure to improve the outcomes in every aspect of a city's operations. A smart building optimizes the experience of occupants, staff, and management by using a modern and connected environment. Innovations in technology that can bring dramatic improvements to design, planning, and policy are critical in developing the cities and buildings of the future.

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