

Special Issue

Smart Grid Integration of Zero Energy Buildings: Challenges and Perspectives

Message from the Guest Editors

The increasing penetration of renewable energy sources and the building and transport electrification are major pathways towards net zero carbon emissions by 2050. The link between them is the smart power grid. The advances in related technologies are significant enough to allow for policies to be put in place. However, the challenges related to zero-energy buildings to the grid are also significant. Proactive energy management, optimization of nano- or microgrids at building or neighborhood level, EV charging and discharging, green hydrogen technologies at building scale, optical and thermal comfort, demand response mechanisms and flexibility management, power grid operation and sustainability in the new paradigm, as well as modern user comfort standards delineate a vivid research field which involves, among others, complex tradeoffs between risk tolerance and the capital investment payback period. All topics may be examined from the viewpoint of the building/EV user, the building/neighborhood, or the main grid, not necessarily converging to the same optimal solution or design. This Special Issue aspires to contribute to this important and timely interdisciplinary research area.

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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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