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Research Progress of Control and Optimization Algorithms for Smart Energy Systems

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Message from the Guest Editor

Dear Colleagues,

With the current grid infrastructure and an increasing percentage of renewable energy generation, there will be days that during certain hours not all renewable energy generated in certain parts of the power grid can be transported to other regions and therefore has to be curtailed. On the other hand, it is also expected that the need for electricity will grow in the future due to an increasing electrification of heating and transport. Large quantities of E-vehicles and heat pumps enlarge variability and lead to higher peak load concentrations. This again may increase the need for costly grid capacity investments.

Optimization and control

To avoid or reduce the need for grid investments, especially in distribution grids, it is essential to exploit the flexibility available in the grid, e.g., by controlling/optimizing the charging of E-vehicles, time-shiftable appliances, and storage assets. Such an optimization of energy streams is often called demand side management (DSM) and has the goal to reach a certain objective for the consumption of electricity within a distribution grid.

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Message from the Editor-in-Chief

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