

IET Generation, Transmission & Distribution Call for Papers

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Special Issue on:

Future Distribution Grids and Integrated Energy Systems (IES)

Future power grids are evolving quickly both in size and complexity, with an increasing interplay with other energy sectors. A multitude of directions and thrust areas are being explored to improve the economics and reliability of future power systems. At low voltage levels, distributed energy resources (DERs) such as wind, solar, energy storage, combined heat and power plants, electric vehicles, and smart loads become prevalent, leading to a dramatic change to the landscape of future distribution grids. Since these DERs are close in proximity, new innovations have been proposed to cluster them to attain a better performance. In addition, direct current (DC) networks, which exist in solar farms and storage farms, bring about new challenges in the cooperation with alternating current (AC) network. At bulk power system levels, the trend of connecting more renewable energy resources into the future power grid is accelerating, and we are moving towards an integrated energy system (IES) on an unprecedented scale. This not only allows the full utilisation of renewable energy resources, but also achieves higher energy efficiency, and enhances the resilience of an energy system against both natural disasters and malicious cyber-attacks. Moreover, in the future IES, the novel market-oriented and service-based optimisation and energy services will be enabled under such a paradigm.

Topics of interest include, but are not limited to:

- Transactive energy distribution systems
- Hybrid (with thermal) distribution systems
- DC only distribution systems
- AC-DC distribution systems
- Advances in AC only distribution systems
- Flexibility harvesting in IESs to facilitate renewable energy accommodation
- Planning and operation strategies in IESs
- Distributed control for smart inverters and IESs
- Enhancing resilience of IESs through coordinated multiple energy resources in IESs
- Impacts of communication and cyber-physical system interdependency on IESs
- Applications of machine learning and big data techniques to planning and operations of IESs

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