

Challenges and Opportunities for Planning and Operation of Smart Grid

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Abstract:

Concerns about energy security, need for diversifying the fuel basket and climate change are growing, spurring global growth in use of renewable energies in the process. A reliable and sustainable power grid is a key enabler for increased usage of renewable energies and variance and uncertainty in renewable energy generation have seriously challenged the operations of power grids. Planning for integration of renewable resources in the grid has become the paramount concern. The application of a broad array of emerging technologies to modernize the existing power grid (collectively referred to as 'smart grid technologies') has been considered an efficient means of enabling greater transfers of renewable energy and preventing large-scale system blackouts.

Hundreds of billions of US dollars have been and are being spent on this multidisciplinary research area. Large pilot and demonstration projects for research on and development of smart grid are in progress in many countries.

This presentation reviews the latest developments in smart grid technologies, including the associated critical technical issues, and dwells upon application of existing technologies, as well as the grid-related future needs of power systems, beside challenges and opportunities involved in planning and operations of smart grid.