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In the last two decades, emerging use of renewable and distributed energy sources in electricity grid has created new challenges for the utility regarding the power quality, voltage stabilization and efficient energy utilization. Power electronic converters are extensively utilized to interface the emerging energy systems (without and with energy storage) and smart buildings with the transmission and distribution systems. Flexible ac transmission systems (FACTSs) and voltage-source converters, with smart dynamic controllers, are emerging as a stabilization and power filtering equipment to improve the power quality. Also, distributed FACTSs play an important role in improving the power factor, energy utilization, enhancing the power quality, and ensuring efficient energy utilization and energy management in smart grids with renewable energy sources. This paper presents a literature survey of FACTS technology tools and applications for power quality and efficient renewable energy system utilization.

General information
Publication status: Published
Corresponding author: Ahmadi, A.
Pages: 502-514
Publication date: 2018
Peer-reviewed: Yes

Publication information
Journal: Renewable and Sustainable Energy Reviews
Volume: 82
ISSN (Print): 1364-0321
Ratings:
BFI (2018): BFI-level 2
Scopus rating (2018): CiteScore 12.21 SJR 3.288 SNIP 3.694
Web of Science (2018): Impact factor 10.556
Web of Science (2018): Indexed yes
Original language: English
Keywords: Renewable Energy, Sustainability and the Environment, FACTS technologies, Green energy utilization, Power quality, Renewable energy sources, Smart-grid
DOI:
10.1016/j.rser.2017.09.062
Source: FindIt
Source ID: 2391497766
Research output: Contribution to journal › Journal article – Annual report year: 2018 › Research › peer-review