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Optimal Load Management in EV-penetrated Networks: A Metaheuristic Approach with FACTS and DG Support

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This book offers a comprehensive techno-economic assessment and optimization framework for the challenges posed by the increasing adoption of electric vehicles by enhancing the performance of power system network through the integration of DG units and flexible AC transmission systems (FACTS) devices, particularly the unified power flow controller (UPFC). It explores various distributed sources available and FACTS controllers and how their integration effectively managed the growing demand due to electric vehicles. By optimizing the placement and sizing of DG units and UPFC devices, the proposed approach aims to enhance grid stability, improve power quality, and increase overall system efficiency. This comprehensive solution not only mitigates the potential strain on existing infrastructure but also paves the way for a more sustainable and resilient electric power system in the face of growing electrification trends.

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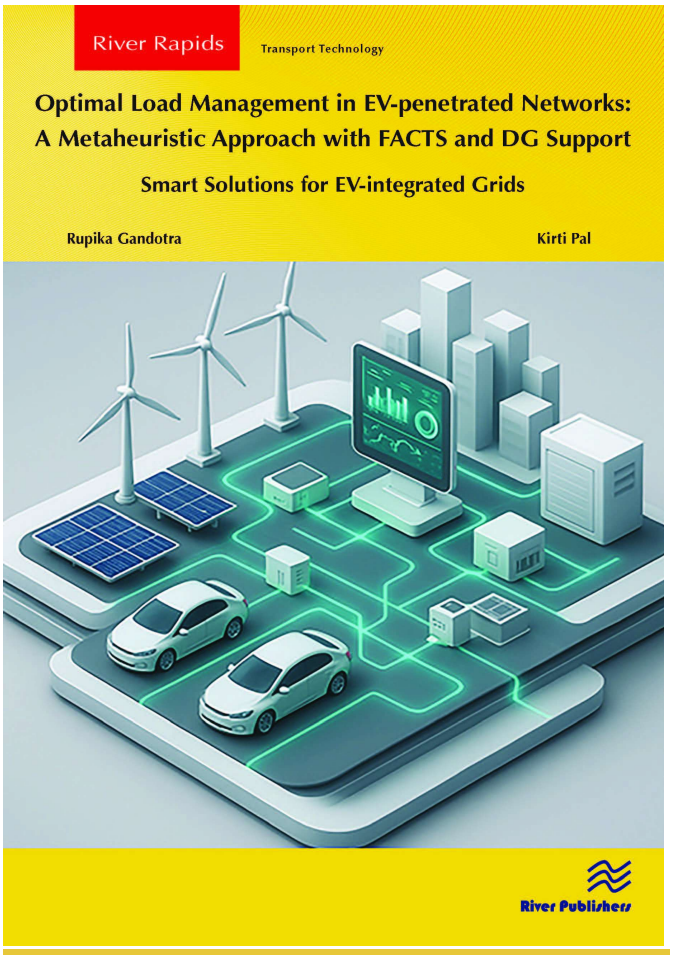

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