Optimization Techniques for Hybrid Power Systems: Renewable Energy, Electric Vehicles, and Smart Grid

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Description:

Optimization Techniques for Hybrid Power Systems: Renewable Energy, Electric Vehicles, and Smart Grid is a comprehensive guide that delves into the intricate world of renewable energy integration and its impact on electrical systems. With the current global energy crisis and the urgent need to address climate change, this book explores the latest advancements and research surrounding optimization techniques in the realm of renewable energy.This book has a focus on nature-inspired and meta-heuristic optimization methods, and it demonstrates how these techniques have revolutionized renewable energy problem-solving and their application in real-world scenarios. It examines the challenges and opportunities in achieving a larger utilization of renewable energy sources to reduce carbon emissions and air pollutants while meeting renewable portfolio standards and enhancing energy efficiency.

Optimization Techniques for Hybrid Power Systems: Renewable Energy, Electric Vehicles, and Smart Grid is explored as a crucial recipe for modern power system processes and management. The integration of energy storage, distributed generation, demand response, and thermally activated technologies into electric distribution and transmission systems is examined in detail. The book also emphasizes the importance of smart-grid technology, artificial intelligence (AI), and advanced multi-energy systems in achieving sustainability and carbon neutrality.This book serves as a valuable resource for researchers, academicians, industry delegates, scientists, and final-year master's degree students. It covers a wide range of topics, including novel power generation technology, advanced energy conversion systems, low-carbon technology in power generation and smart grids, AI-based control strategies, data analytics, electrified transportation infrastructure, and grid-interactive building infrastructure.

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Topics Covered:

- Advanced Multi-Energy-Based Hybrid System
- AI Software Tools and Platforms
- AI-Based Decision-Making Process
- Artificial Intelligence
- Data Analytics in Generation, Transmission and Consumption
- Electrified Transportation Infrastructure
- Energy Cascade Conversion System
- Energy Infrastructure with Energy-Efficient Functionalities
- Energy Management Strategy; Grid-Interactive Building Infrastructure
- Low Carbon Technology in Power Generation New Equipment and Devices for Emission Reduction
- Novel Power Generation Technology
- Renewable Energy; Smart Energy; Smart Grid

Subject: Scientific, Technical, & Medical (STM)
Readership Level: Advanced-Academic Level (Research Recommended)

Classification: Edited Reference
Research Suitable For: Advanced Undergraduate Students; Graduate Students; Researchers; Academicians; Professionals; Practitioners