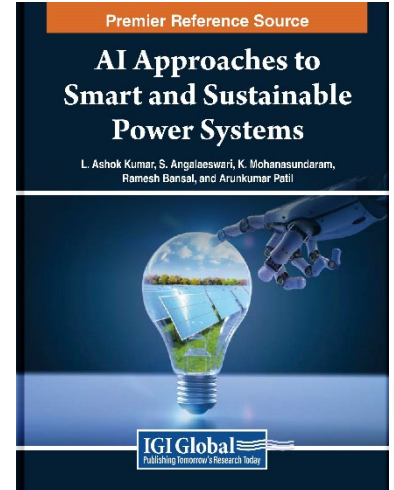


# AI Approaches to Smart and Sustainable Power Systems

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## Description:

Today, the global power demand relies on a delicate balance between conventional and renewable energy systems, necessitating both efficient power generation and the effective utilization of these energy resources through appropriate energy storage solutions. Integrating microgrid systems into the utility grid has become a critical facet of modern power systems. The intermittent and unpredictable nature of these energy sources poses a formidable challenge for academic scholars and researchers. This compels them to explore under-investigated areas, including energy source estimation, storage elements, load pattern prediction, coordination among distributed sources, and the development of energy management algorithms for precise and efficient control.

**AI Approaches to Smart and Sustainable Power Systems** tackles these issues using cutting-edge AI techniques. It examines the most effective methods to optimize voltage, frequency, power, fault diagnosis, component health, and overall power system quality and reliability. AI empowers predictive and preventive maintenance for a sustainable energy future. The book focuses on emerging research areas, including renewable energy, power flow calculations, demand scheduling, real-time performance validation, and AI integration into modern power systems, accompanied by insightful case studies.

**ISBN:** 9798369315866 **Pages:** 432 **Copyright:** 2024 **Release Date:** 3/25/2024

**Hardcover:** \$300 **Softcover:** \$225 **E-Book:** \$300 **Hardcover + E-Book:** \$360

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Energy Storage	Renewable Energy
Energy Systems	Smart Grids
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