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Nota di contenuto	Chapter 1. System overview -- Chapter 2. Smart distribution power network situation awareness -- Chapter 3. Photovoltaic prediction, virtual collection -- Chapter 4. Multi-energy load forecasting of integrated energy system -- Chapter 5. Optimal planning of energy storage considering uncertainty of load and wind generation -- Chapter 6. Energy supplying facilities planning for electric vehicles -- Chapter 7. Multiple equipment planning for integrated energy system -- Chapter 8. ay-ahead risk averse market clearing considering demand response -- Chapter 9. Optimal operation via cooperative energy and reserve scheduling -- Chapter 10. Optimal interaction strategy for vehicle-to-grid -- Chapter 11. Concluding remarks.
Sommario/riassunto	The surge in renewable and distributed energy sources has posed significant challenges for smart power distribution network (SPDN). These challenges fall into two main categories: the unpredictability of renewable energy sources and the complexities introduced by numerous electrical devices and their interdependencies, affecting forecasting and operational performance. As the emphasis on SPDN's economic and environmental aspects grows, this book focuses on the

vital themes of sustainability and cost-efficiency in SPDN forecasting, planning, and operation. It is structured into three key parts: 1. SPDN Situation Awareness: This section assesses prior research methods, analyzes their shortcomings while dissecting SPDN's unique situation awareness characteristics. Then, some forecast and virtual collection methods are presented. 2. Boosting SPDN Planning: Addressing optimal planning challenges in SPDN, this part introduces advanced modelling and algorithm solving techniques, tailored to mitigate SPDN's inherent uncertainty. 3. Enhancing SPDN Operation: Considering a variety of equipment types and controllable loads, this section explores strategies to boost SPDN operational performance. It covers control methodologies for electric vehicles, flexible loads, energy storage, and related equipments, etc. Tailored for university researchers, engineers, and graduate students in electrical engineering and computer science, this book is a valuable resource for comprehending SPDN's situation awareness, planning, and operation intricacies in the context of sustainability and economic efficiency.
