1. Record Nr. UNINA9910647388203321

Autore	Wan Yanni
Titolo	Distributed Economic Operation in Smart Grid: Model-Based and Model-Free Perspectives / / by Jiahu Qin, Yanni Wan, Fangyuan Li, Yu Kang, Weiming Fu
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2023
ISBN	981-19-8594-4
Edizione	[1st ed. 2023.]
Descrizione fisica	1 online resource (246 pages)
Collana	Studies in Systems, Decision and Control, , 2198-4190 ; ; 455
Disciplina	605
Soggetti	Electric power distribution Mathematical optimization Vehicles Probabilities Graph theory Electronics Energy Grids and Networks Optimization Vehicle Engineering Graph Theory in Probability Electronics and Microelectronics, Instrumentation
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Introduction -- Preliminaries -- Model-Based Distributed Optimization -- Model-Free Distributed Optimization -- Extensions to PEVs Charging/Discharging Scheduling.
Sommario/riassunto	This book aims to work out the distributed economic operation in smart grids in a systematic way, which ranges from model-based to model-free perspectives. The main contributions of this book can be summarized into three folds. First, we investigate the fundamental economic operation problems in smart grids from model-based perspective. Specifically, these problems can be modeled as deterministic optimization models, and we propose some distributed optimization algorithms by integrating the multi-agent consensus

theory and optimization techniques to achieve the distributed coordination of various generation units and loads. Second, due to the randomness of the large-scale renewable energies and the flexibility of the loads, we further address these economic operation problems from a model-free perspective, and we propose learning-based approaches to address the uncertainty and randomness. At last, we extend the idea of model-based and model-free algorithms to plug-in electric vehicles (PEVs) charging/discharging scheduling problem, the key challenge of which involves multiple objectives simultaneously while the behavior of PEVs and the electricity price are intrinsically random. This book presents several recent theoretical findings on distributed economic operation in smart grids from model-based and model-free perspectives. By systematically integrating novel ideas, fresh insights, and rigorous results, this book provides a base for further theoretical research on distributed economic operation in smart grids. It can be a reference for graduates and researchers to study the operation and management in smart grids. Some prerequisites for reading this book include optimization theory, matrix theory, game theory, reinforcement learning, etc.