Smarter Energy
From Smart Metering to the Smart Grid

This book presents cutting-edge perspectives and research results in smart energy spanning multiple disciplines across four main topics: smart metering, smart grid modeling, control and optimization, and smart grid communications and networking.

Chapters from an international panel of experts in the field cover: policy-preserving data aggregation in smart metering systems; smart price-based scheduling of flexible residential appliances; smart tariffs for demand response from smart metering platforms; decentralized models for real-time renewable integration in future grid; distributed and decentralized control in future power systems; multiobjective optimization for smart grid system design; frequency regulation of smart grid and dynamic demand control; and battery energy storage systems: distributed frequency control and demand-side management; game theory approaches for demand-side management in the smart grid; energy storage systems and grid integration: overview of research in the ADVANTAGE project; big data analytics of power grid from random matrix theory; a model-driven evaluation of demand response communication protocols for smart grid; energy-efficient smart grid communications; and cybersecurity of smart grid state estimation.

Hungjian Sun is a Lecturer in smart grid with the University of Durham, UK. He has made one contribution to the IEEE 802.16a Standard and published four book chapters and more than 60 papers in refereed journals and conferences. His recent research interests include smart grids, wireless communications, and signal processing.

Nikos D. Hatziargyriou is Chairman and CEO of the Hellenic Distribution Network Operator and is Professor in Power Systems at the Electrical and Computer Engineering Department of the National Technical University of Athens. He is chair of the EU Technology Platform SmartGrids and author of a book and of more than 180 journal publications and 500 conference proceeding papers.

H. Vincent Poor, Princeton, EnSI, is the Michael Henry Strater University Professor at Princeton University. His research interests are in wireless communications, smart grid, and related fields. He holds a PhD. In EECS from Princeton, and Honorary degrees from a number of universities. In 2016, he received the John Fritz Medal.

Laurence Carpanini leads the development of Smart Energy Solutions for IBM in Europe. He has over 30 years' experience in the sector, providing strategic leadership, subject matter expertise and an infectious enthusiasm for smarter energy solutions driving industry transformation.

Miguel Ángel Sánchez Forcall is Director of Global Smart Grids at the Spanish utility company IBERDROLA and Professor in the postgraduate course of energy in the University of Cordoba. He is a member of the IIE Board of Directors and President of its European division, Member of the Advisory Committee of the European platform "SMART GRID", and member of the Advisory Committee of the Smart Grids Task Force (DG Energy).