



# Microgrids and other Local Area Power and Energy Systems

*By Alexis Kwasinski, Wayne Weaver, Robert S. Balog*

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Describing the formation, integration, planning, composition and operation of microgrids, this book explains how local power systems can address limitations in conventional electric power grids and provides insights into the practical implementation needs and outcomes of microgrid technology. All aspects of microgrid design and applications are covered, including the main technologies involved in microgrids and other local area power and energy systems. The reliability and economic characteristics of microgrid system architecture, energy storage and grid interaction are explored in depth. Over 300 illustrations and real-world application examples make this a fully self-contained resource, ideal for graduate students and professionals in electrical, mechanical and chemical engineering and materials science.

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## **Editorial Review**

### **Review**

"This book brings together all the important design, operation, and control challenges for microgrids and shows why they are vital to the future power grid. It is a comprehensive, timely, and thorough treatment that offers a textbook for advanced students or a learning manual for industry practitioners seeking broad coverage of microgrids. An excellent first book on the subject for those engaged in emerging energy systems."

Philip Krein, University of Illinois, Urbana-Champaign

"Looking to the future of dispersed control implemented in localized power systems with diverse resources, architectures, and management, this book circulates correctly around the expanding capabilities and falling costs of power electronics. It comprehensively lays out techniques for conducting the key reliability, resiliency, and related economic analyses, neatly introduces the major generation and storage technologies, and finally tackles the challenges of system integration, control, and interconnection."

Chris Marnay, Lawrence Berkeley National Laboratory

### **About the Author**

Alexis Kwasinski is an Associate Professor and R. K. Mellon Faculty Fellow in Energy in the Department of Electrical and Computer Engineering at the University of Pittsburgh. Previously, he was an Associate Professor (with tenure) at the University of Texas, Austin. He is an Associate Editor for the IEEE Transactions on Energy Conversion.

Wayne Weaver is the Dave House Associate Professor of Electrical Engineering in the Department of Electrical and Computer Engineering at Michigan Technological University, Houghton. He is a registered professional engineer in the State of Illinois.

Robert S. Balog is an Associate Professor in the Electrical and Computer Engineering Department at Texas A & M University and holds a joint appointment at Texas A & M University at Qatar. He is the Director of the Renewable Energy and Advanced Power Electronics Research Laboratory, Director of the Solar Energy Technology Testing Laboratory and Co-director of the National Science Foundation Next Generation Photovoltaics I/UCRC at Texas A & M University. He is a Registered Professional Engineer in the State of Illinois and serves on UL technical standards development committees related to photovoltaic energy systems. He is also a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE), an elected Member-at-Large of the IEEE Power Electronics Society, and a Technical Program Chair of the 2016 IEEE Energy Conversion Congress and Expo (ECCE).

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