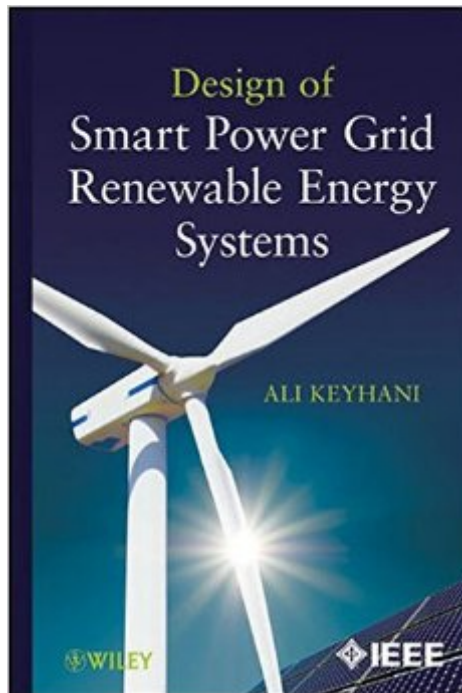


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# Design Of Smart Power Grid Renewable Energy Systems



## Synopsis

To address the modeling and control of smart grid renewable energy system into electric power systems, this book integrates three areas of electrical engineering: power system engineering, control systems engineering and power electronics. The approach to the integration of these three areas differs from classical methods. Due to complexity of this task, the author has decided to present the basic concepts, and then present a simulation test bed in matlab to use these concepts to solve a basic problem in development of smart grid energy system. Therefore, each chapter has three parts: first a problem of integration is stated and its importance is described. Then, the mathematical model of the same problem is formulated. Next, the solution steps are outlined. This step is followed by developing a matlab simulation test bed. Each chapter ends with a set of problems and projects. The book is intended be used as textbook for instruction or by researchers. This book can be used as undergraduate text for both electrical and mechanical engineers. The prerequisite for the course is a course in fundamental of electrical engineering.

## Book Information

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## Customer Reviews

- This book is a great resource for those who plan to teach modern (smart grid) renewable energy systems both from analysis and design perspective.- It would well suit in undergraduate electric power engineering curriculum (preferably in senior year).- General engineering programs would also welcome this text.- Power Electronics and Power System Analysis courses can be prerequisites

before teaching from this book.- However, depending on the teaching style or student needs, these prerequisites may not be necessary.- This book provides basic operational principles of smart grid and micro grid.- Plenty of practical real life examples make subject topic for each chapter real clear. Students would love this !- The analysis is based on Sine-PWM inverters.- Interdisciplinary nature (Inverters, PV modules, wind generators, power systems operation/control/analysis, smart grid/microgrid).- Recent research topics are also highlighted. I really liked this.

Worst book I've ever purchased. Typos all over the place. Somebody forgot Hemingway's last step to edit sober. On top of the horrible quality of writing, this book doesn't teach mathematical & technical aspects well. Very few examples for how many topics are covered, and the examples that are in it are often skipping steps or have errors in them. Our professors has corrected quite a few at this point. It earns the sole star because it does cover good information, perhaps for someone who just wants an overview of power grids, but do not use this to learn technical information. It's the worst book for a student, especially in a class with a professor who doesn't know how to teach and you depend on this book...

The book starts with basic power engineering principles and elaborately introduces the new concepts of micro-grid and smart-grid. The book has many classical power engineering topics covered that can be definitely used for power engineering courses. The renewable energy aspect of the book stands out as it provides a complete guide to calculate renewable energy based systems including solar and wind. Detailed design of each component as well as sizing and grid formation are provided. Sizing of inverters, solar, wind, storage and grid connectivity are discussed in details. Power electronics chapters start with introduction of basic circuits and end up with selection guide for inverters for smart-grid and micro-grids. It is also a great resource for design and field engineers with a lot of tables, sample designs, and proposed systems. It is a good text and reference book for power and renewable energy major undergraduate and graduate students.

The face of the power and energy systems have been subjected to a lot of changes during the past decade. However, the classical textbooks in the power systems do not deal with these changes or discuss them. The current book gives the students a very nice transition from the classical power systems towards modern systems discussing the effects of renewable energy sources and new aspects of control and operation. It discusses the effects and operation of power-electronics converters and how they are integrated with the conventional power systems. In the photovoltaic

systems, it contains very nice design examples. Overall, I found this book a good source for upper-level undergraduates who want to get familiar with smart grids and their design and operation.

This is an absolutely wonderful work on the subject. A perfect balance on the theoretical and practical aspects of the design of smart grid with renewable energy. Provides necessary background in the first part and therefore helps reader build a working knowledge. Provides a wealth of examples, exercises, and applications. Perfect for self-study as well as classroom use.

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