

Handbook of Renewable Energy Technology, edited by Ahmed F. Zobaa and Ramesh C. Bansal (Singapore: World Scientific Publishing Company) 876 pages, ISBN 978-981-4289-06-1, hardback.

Ramteen Sioshansi

Recent years have seen a renewed focus on increasing our use o

become especially pertinent in distributed generation settings, wherein the hydroelectric plant is the primary (or possibly only) electricity source.

Section 5 focuses on feasibility studies and grid-integration challenges raised by renewables. Chapter 21 summarizes a number of software tools that are available for feasibility, economic, and emissions analysis of pure and hybrid renewable energy systems. This includes a comparison of their modeling capabilities, as some tools are limited in being able to model all facets of a renewable energy system. The remaining three chapters of this section delve into issues raised by distributed renewable generation. Chapter 22 introduces the range of effects that distributed generation can have, for instance on ancillary services, power voltage and harmonics, and power flows. It also uses a case study to demonstrate how the physical location of distributed generation assets can affect losses within a distribution system. Chapter 23 builds on this by introducing a number of different algorithms that can be used to optimize the location of distributed generation to minimize such losses. Chapter 24 introduces the concept of a virtual power producer (VPP). The VPP is an aggregation of multiple distributed generation resources that can participate in the market to provide energy and ancillary and other services. The chapter also explains the use of a multi-agent simulator to model the potential interactions between VPPs and other market participants.

The final section returns to the issue of power electronics and quality, which is first introduced in the context of wind. Chapter 25 discusses different power electronic converters available for wind, solar photovoltaic, and energy storage systems. Chapter 26 presents models that can be used to study the use of induction generators in wind turbines, while chapter 27 treats voltage control of doubly-fed induction generator in wind systems. Chapter 28 raises the issue of power quality instrumentation and measurement with renewables. This includes how often power quality measurements should be conducted, where meters should be physically sited within a power system, and how to process the resulting data. Chapter 29 finally introduces a goal programming model to determine how energy resources should be allocated to different uses. The chapter uses a number of case studies based on rural villages in India, and demonstrates that depending on the priorities of the planner, different energy technologies should be promoted or put to different end uses.

The clear strength of this book is its broad coverage of many technologies. This ranges from the well known (e.g. wind and solar) to the niche (e.g. solar drying). Thus, the overview chapters that discuss the various technologies