1. Record Nr. UNINA9910830232903321

Titolo	Wind power in power systems [[electronic resource] /] / edited by Thomas Ackermann
Pubbl/distr/stampa	Chichester, West Sussex ; ; Hoboken, N.J., : Wiley, 2012
ISBN	1-283-71669-0 1-119-94183-0 1-119-94184-9
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (1124 p.)
Classificazione	TEC031000
Altri autori (Persone)	AckermannThomas
Disciplina	621.31/2136 621.312136
Soggetti	Wind power plants Wind power
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Wind Power in Power Systems; Contents; Contributors; Abbreviations; Notation; 1 Introduction; 2 Preface: Wind Power Myths Debunked; 2.1 Can Grid Operators Deal with the Variability of Wind Power?; 2.2 Does Wind Power Require Back-up Generation?; 2.3 Aren't More CO2 Emissions Generated with Wind Power in Power Systems than Without, Due to Back-up Requirements?; 2.4 Does Wind Power Require Storage?; 2.5 Isn't the Existing Flexibility Already Fully Utilized?; 2.6 How Often Does the Wind Stop Blowing Everywhere at the Same Time?; 2.7 To What Extent can Wind Power Production be Predicted? 2.8 Is it Expensive to Integrate Wind?2.9 Doesn't Wind Power Production Require New Transmission, and won't that Make Wind Expensive?; 2.10 Does Wind Power have Capacity Credit?; 2.11 Don't Wind Power Plants have Low Capacity Factors?; 2.12 Is Wind Power Generation Cost-competitive with Coal or Nuclear?; 2.13 Is there a Limit to How Much Wind Generation Capacity can be Accommodated by the Grid?; 2.14 Summary; Acknowledgment; References; Part A: THEORETICAL BACKGROUND; 3 Historical Development and Current Status of Wind Power; 3.1 Introduction; 3.2 Historical Background 3.2.1 Mechanical Power Generation3.2.2 Electrical Power Generation;

3.3 Current Status of Wind Power Worldwide; 3.3.1 Overview of Grid-connected Wind Power Generation; 3.3.2 Europe; 3.3.3 North America; 3.3.4 South and Central America; 3.3.5 Asia and Pacific; 3.3.6 Middle East and Africa; 3.3.7 Overview of Stand-Alone Generation; 3.3.8 Wind Power Economics; 3.3.9 Environmental Issues; 3.4 Status of Wind Turbine Technology; 3.4.1 Design Approaches; 3.5 Conclusions; Acknowledgments; References; 4 Wind Power in Power Systems: An Introduction; 4.1 Introduction; 4.2 Power System History
4.3 Current Status of Wind Power in Power Systems4.4 Network Integration Issues for Wind Power; 4.5 Basic Electrical Engineering; 4.6 Characteristics of Wind Power Generation; 4.6.1 The Wind; 4.6.2 The Physics; 4.6.3 Wind Power Production; 4.7 Basic Integration Issues Related to Wind Power; 4.7.1 Consumer Requirements; 4.7.2 Requirements from Wind Farm Operators; 4.7.3 The Integration Issues; 4.8 Conclusions; Appendix Mechanical Equivalent to Power System Operation with Wind Power; A.1 Introduction; A.2 Active Power Balance; A.3 Synchronous Machines; A.4 Asynchronous Machines
A.5 Power Electronic InterfacesA.6 Frequency Control; A.7 Wind Power; A.8 Reactive Power Balance; A.9 Asynchronous Machines; A.10 Capacitors; A.11 Synchronous Machines; A.12 Power Electronic Interfaces; References; 5 Generators and Power Electronics for Wind Turbines; 5.1 Introduction; 5.2 State-of-the-Art Technologies; 5.2.1 Overview of Wind Turbine Topologies; 5.2.2 Overview of Power Control Concepts; 5.2.3 State-of-the-Art Generators; 5.2.4 State-of-the-Art Power Electronics; 5.2.5 State-of-the-Art Market Penetration; 5.3 Generator Concepts; 5.3.1 Asynchronous (Induction) Generator
5.3.2 Synchronous Generator (SG)

Sommario/riassunto

The second edition of the highly acclaimed Wind Power in Power Systems has been thoroughly revised and expanded to reflect the latest challenges associated with increasing wind power penetration levels. Since its first release, practical experiences with high wind power penetration levels have significantly increased. This book presents an overview of the lessons learned in integrating wind power into power systems and provides an outlook of the relevant issues and solutions to allow even higher wind power penetration levels. This includes the development of standard wind turbine sim