

1. Record Nr.	UNINA9910808006103321
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Titolo	Renewable energy integration : practical management of variability, uncertainty and flexibility in power grids // Lawrence E. Jones
Pubbl/distr/stampa	London, England : , : Academic Press, , 2014 ©2014
ISBN	0-12-408122-3
Descrizione fisica	1 online resource (529 p.)
Disciplina	621.042
Soggetti	Renewable resource integration Renewable energy sources Smart power grids Electric power distribution
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 at the end of each chapters and index.
Nota di contenuto	Front Cover; Renewable Energy Integration: Practical Management of Variability, Uncertainty, and Flexibility in Power Grids; Copyright; Praise for Renewable Energy Integration; Dedication; Contents; About the Contributors; About the Editor; Acknowledgments; Foreword from Europe; Foreword from the USA; Introduction; OVERVIEW OF CHAPTERS; WHO SHOULD READ THIS BOOK; HOW TO READ THIS BOOK; Part 1 Policy and Regulation; Chapter 1 - The Journey of Reinventing the European Electricity Landscape-Challenges and Pioneers; 1 Background; 2 The post-2020 Europe 3 Renewable integration in Europe: Challenges and policy responses 4 The story of three pioneers: History and future; 5 Trends & future outlook; References; Chapter 2 - Policies for Accommodating Higher Penetration of Variable Energy Resources: US Outlook and Perspectives; 1 Recent renewable deployment trends; 2 Technical challenges posed by wind generation for power system operation & planning; 3 Economic challenges associated with high wind energy: the potential for curtailment; 4 Transmission development for wind integration: challenges and success stories

5 FERC order 764 on variable energy resource integration
6 The future of renewable development in the united states;
Chapter 3 - Harnessing and Integrating Africa's Renewable Energy Resources;
1 Introduction;
2 Background and context;
3 Sub-Saharan Africa in the global energy transition;
4 The way forward;
5 Conclusion;
References;
Part 2 Modeling of Variable Energy Resources;
Chapter 4 - Multi-Dimensional, Multi-Scale Modeling and Algorithms for Integrating Variable Energy Resources in Power Netwo ...;
1 Power system dimensions and scales;
2 Modeling and analysis;
3 Optimization and control
4 Data handling and visualization
5 Integrated multi-dimensional analytics platforms;
6 Conclusions;
References;
Chapter 5 - Scandinavian Experience of Integrating Wind Generation in Electricity Markets;
1 Introduction;
2 The transmission system operators;
3 The Baltic-Nordic spot market;
4 Price zones;
5 Day-ahead grid congestion management: market splitting;
6 Maintaining the security of supply: regulating energy;
7 Regulating energy and the security of supply: making the wind turbines part of the solution;
8 Other mechanisms and policies for integrating wind in electricity markets
9 Efficient and non-efficient multistate markets (EU as a case)
10 Conclusion: The moral of the spot case from Northern Europe;
Chapter 6 - Case Study-Renewable Integration: Flexibility Requirement, Potential Overgeneration, and Frequency Response Cha ...;
1. ISO real-time market overview;
2. Renewable generation effects in the ISO real-time market;
3. Flexibility requirement;
4. Intra-hour flexibility requirement;
5. Potential overgeneration problems;
6. Inertia and frequency response;
7. Sensitivities;
References;
Part 3 Variable Energy Resources in Power System and Market Operations
Chapter 7 - Analyzing the Impact of Variable Energy Resources on Power System Reserves

Sommario/riassunto

Renewable Energy Integration is a ground-breaking new resource, the first to offer a distilled examination of the intricacies of integrating renewables into the power grid and electricity markets. It offers informed perspectives from internationally renowned experts on the challenges to be met, and solutions based on demonstrated best practices developed by operators around the world. The book's focus on practical implementation of strategies provides real-world context for theoretical underpinnings and the development of supporting policy frameworks. The book considers a myri
