

1. Record Nr.	UNINA9910136351803321
Autore	Diaz-Gonzalez Francisco
Titolo	Energy storage in power systems // Francisco Diaz-Gonzalez, Andreas Sumper, Oriol Gomis-Bellmunt
Pubbl/distr/stampa	Chichester, [England] : , : Wiley, , 2016 ©2016
ISBN	1-118-97130-2 1-118-97131-0
Descrizione fisica	1 online resource (311 p.)
Disciplina	621.31/26
Soggetti	Energy storage Electric power systems - Reliability Peak load
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	ENERGY STORAGE IN POWER SYSTEMS; Contents; Foreword; Preface; 1 An Introduction to Modern Power Systems; 1.1 Introduction; 1.2 The Smart Grid Architecture Model; 1.3 The Electric Power System; 1.3.1 The Structure of the Power System; 1.3.2 The Fundamentals of Power System Analysis; 1.4 Energy Management Systems; 1.5 Computational Techniques; 1.5.1 Optimization Methods and Optimal Power Flow; 1.5.2 Security-Constrained Optimal Power Flow; 1.6 Microgrids; 1.7 The Regulation of the Electricity System and the Electrical Markets; 1.8 Exercise: A Load-Flow Algorithm with Gauss-Seidel 2 Generating Systems Based on Renewable Power 2.1 Renewable Power Systems; 2.1.1 Wind Power Systems; 2.1.2 Solar Photovoltaic Power Systems; 2.2 Renewable Power Generation Technologies; 2.2.1 Renewable Power Generation Technology Based on Rotative Electrical Generators; 2.2.2 Wind Turbine Technology; 2.2.3 Photovoltaic Power Plants; 2.3 Grid Code Requirements; 2.4 Conclusions; 3 Frequency Support Grid Code Requirements for Wind Power Plants; 3.1 A Review of European Grid Codes Regarding Participation in Frequency Control; 3.1.1 Nomenclature and the Definition of Power Reserves 3.1.2 The Deployment Sequence of Power Reserves for Frequency

Control 3.1.3 A Detailed View on the Requirements for WPPs in the Irish Grid Code; 3.1.4 A Detailed View on the Requirements for WPPs in the UK Grid Code; 3.1.5 Future Trends Regarding the Provision of Primary Reserves and Synthetic Inertia by WPPs; 3.2 Participation Methods for WPPs with Regard to Primary Frequency Control and Synthetic Inertia; 3.2.1 Deloading Methods of Wind Turbines for Primary Frequency Control; 3.2.2 Synthetic Inertia; 3.3 Conclusions; 4 Energy Storage Technologies; 4.1 Introduction
4.2 The Description of the Technology 4.2.1 Pumped Hydroelectric Storage (PHS); 4.2.2 Compressed Air Energy Storage (CAES); 4.2.3 Conventional Batteries and Flow Batteries; 4.2.4 The Hydrogen-Based Energy Storage System (HESS); 4.2.5 The Flywheel Energy Storage System (FESS); 4.2.6 Superconducting Magnetic Energy Storage (SMES); 4.2.7 The Supercapacitor Energy Storage System; 4.2.8 Notes on Other Energy Storage Systems; 4.3 Power Conversion Systems for Electrical Storage; 4.3.1 Application: Electric Power Systems; 4.3.2 Other Applications I: The Field of Electromobility
4.3.3 Other Applications II: Buildings 4.3.4 The Battery Management System (BMS); 4.4 Conclusions; 5 Cost Models and Economic Analysis; 5.1 Introduction; 5.2 A Cost Model for Storage Technologies; 5.2.1 The Capital Costs; 5.2.2 Operating and Maintenance Costs; 5.2.3 Replacement Costs; 5.2.4 End-of-Life Costs; 5.2.5 The Synthesis of a Cost Model; 5.3 An Example of an Application; 5.3.1 The Collection of Data for Evaluation of the Cost Model; 5.3.2 Analysis of the Results; 5.4 Conclusions; 6 Modeling, Control, and Simulation; 6.1 Introduction
6.2 Modeling of Storage Technologies: A General Approach Orientated to Simulation Objectives
