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Nota di contenuto	Part I: Introduction -- Power and Renewable Energy Systems -- Demand Side Management -- Algebraic Modelling Languages -- Structure of the Book -- References -- Part II: Mathematical Optimization Models -- Mathematical Modelling and Solution Approaches -- Energy Response Mathematical Models -- Demand Response Mathematical Models -- Part III: Algebraic Modelling Languages Research Applications -- Dynamic Economic Emissions Dispatch -- Generator Maintenance Scheduling -- Combined Heat and Power (CHP) Dispatch -- Hybrid Grid Connected Renewable Energy Sources (RES) Powered Microgrid with Demand Response -- Optimal Power Flow (OPF) -- Unit Commitment (UC) -- Transmission Network Expansion Planning -- Generation Capacity Expansion Planning -- Distribution Network Expansion Planning -- Part IV: Conclusion and Extensions -- Further Research and Extensions.
Sommario/riassunto	This book presents mathematical models of demand-side management programs, together with operational and control problems for power and renewable energy systems. It reflects the need for optimal operation and control of today’s electricity grid at both the supply and demand spectrum of the grid. This need is further compounded by the advent of smart grids, which has led to increased customer/consumer

participation in power and renewable energy system operations. The book begins by giving an overview of power and renewable energy systems, demand-side management programs and algebraic modeling languages. The overview includes detailed consideration of appliance scheduling algorithms, price elasticity matrices and demand response incentives. Furthermore, the book presents various power system operational and control mathematical formulations, incorporating demand-side management programs. The mathematical formulations developed are modeled and solved using the Advanced Interactive Multidimensional Modeling System (AIMMS) software, which offers a powerful yet simple algebraic modeling language for solving optimization problems. The book is extremely useful for all power system operators and planners who are concerned with optimal operational procedures for managing today’s complex grids, a context in which customers are active participants and can curb/control their demand. The book details how AIMMS can be a useful tool in optimizing power grids and also offers a valuable research aid for students and academics alike. .