1. Record Nr. UNINA9910438071303321

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Titolo	Complementarity Modeling in Energy Markets / / by Steven A. Gabriel, Antonio J. Conejo, J. David Fuller, Benjamin F. Hobbs, Carlos Ruiz
Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 2013
ISBN	1-4419-6123-2
Edizione	[1st ed. 2013.]
Descrizione fisica	1 online resource (636 p.)
Collana	International Series in Operations Research & Management Science, , 0884-8289 ; ; 180
Disciplina	330
Soggetti	Operations research Decision making Macroeconomics Management science Operations Research/Decision Theory Macroeconomics/Monetary Economics//Financial Economics Operations Research, Management Science
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	Introduction and Motivation -- Optimality and Complementarity -- Some Microeconomic Principles -- Equilibria and Complementarity Problems -- Variational Inequality Problems -- Optimization Problems Constrained by Optimization Problems -- Equilibrium Problems with Equilibrium Constraints -- Algorithm for LCPs, NCPs, and VIs -- Some Advanced Algorithms for VI Decomposition, MPCCs and EPECs -- Natural Gas Market Modeling -- Electricity and Environmental Markets -- Multicommodity Equilibrium Models: Accounting for Demand-Side Linkages.
Sommario/riassunto	This addition to the ISOR series introduces complementarity models in a straightforward and approachable manner and uses them to carry out an in-depth analysis of energy markets, including formulation issues and solution techniques. In a nutshell, complementarity models generalize: a. optimization problems via their Karush-Kuhn-Tucker conditions b. non-cooperative games in which each player may be solving a separate but related optimization problem with potentially

overall system constraints (e.g., market-clearing conditions) c. economic and engineering problems that aren't specifically derived from optimization problems (e.g., spatial price equilibria) d. problems in which both primal and dual variables (prices) appear in the original formulation (e.g., The National Energy Modeling System (NEMS) or its precursor, PIES). As such, complementarity models are a very general and flexible modeling format. A natural question is why concentrate on energy markets for this complementarity approach? As it turns out, energy or other markets that have game theoretic aspects are best modeled by complementarity problems. The reason is that the traditional perfect competition approach no longer applies due to deregulation and restructuring of these markets and thus the corresponding optimization problems may no longer hold. Also, in some instances it is important in the original model formulation to involve both primal variables (e.g., production) as well as dual variables (e.g., market prices) for public and private sector energy planning. Traditional optimization problems can not directly handle this mixing of primal and dual variables but complementarity models can and this makes them all that more effective for decision-makers.