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	Nota di contenuto	Contents; Preface; 1. A Survey of Electricity and Related Markets; 1.1 The electricity markets; 1.1.1 Electricity contracts with physical delivery .; 1.1.2 Financial electricity contracts; 1.2 The gas market; 1.2.1 Futures and options on gas; 1.3 The temperature market; 1.4 Other related energy markets; 1.5 Stochastic modelling of energy markets; 1.5.1 Spot price modelling; 1.5.2 Forward and swap pricing in electricity and related markets; 1.6 Outline of the book; 2. Stochastic Analysis for Independent Increment Processes; 2.1 Definitions 2.2 Stochastic integration with respect to martingales 2.3 Random jump measures and stochastic integration; 2.4 The Levy-Kintchine decomposition and semimartingales; 2.5 The It Formula for semimartingales; 2.6 Examples of independent increment processes; 2.6.1 Time-in homogeneous compound Poisson process; 2.6.2 Models based on the generalized hyperbolic distributions; 2.6.3 Models based on the Variance-Gamma and CGMY distributions; 3. Stochastic Models for the Energy Spot Price Dynamics; 3.1 Introduction; 3.2.1 Geometric

models; 3.2.2 Arithmetic models

3.3 The auto correlation function of multi-factor Ornstein- Uhlenbeck processes 3.4 Simulation of stationary Ornstein-Uhlenbeck processes: a case study with the arithmetic spot model; 4. Pricing of Forwards and Swaps Based on the Spot Price; 4.1 Risk-neutral forward and swap price modelling; 4.1.1 Risk-neutral probabilities and the Esscher transform; 4.1.2 The Esscher transform for some specific models; 4.2 Currency conversion for forward and swap prices; 4.3 Pricing of forwards; 4.3.1 The geometric case; 4.3.2 The arithmetic case .; 4.4 Pricing of swaps; 4.4.1 The geometric case

4.4.2 The arithmetic case 5. Applications to the Gas Markets; 5.1 Modelling the gas spot price; 5.1.1 Empirical analysis of UK gas spot prices; 5.1.2 Residuals modeled as a mixed jump-diffusion process; 5.1.3 NIG distributed residuals; 5.2 Pricing of gas futures; 5.3 Inference for multi-factor processes; 5.3.1 Kalman filtering; 6. Modelling Forwards and Swaps Using the Heath-Jarrow- Morton Approach; 6.1 The HJM modelling idea for forward contracts; 6.2 HJM modelling of forwards; 6.3 HJM modelling of swaps; 6.3.1 Swap models based on forwards; 6.4 The market models

6.4.1 Modelling with jump processes 7. Constructing Smooth Forward Curves in Electricity Markets; 7.1 Swap and forward prices; 7.1.1 Basic relationships; 7.1.2 A continuous seasonal forward curve; 7.2 Maximum smooth forward curve; 7.2.1 A smooth forward curve constrained by closing prices; 7.2.2 A smooth forward curve constrained by bid and ask spreads; 7.3 Putting the algorithm to work .; 7.3.1 Nord Pool example I: A smooth curve; 7.3.2 Nord Pool example II: Preparing a data set and analysing volatility; 8. Modelling of the Electricity Futures Market

8.1 The Nord Pool market and financial contracts

Sommario/riassunto	The markets for electricity, gas and temperature have distinctive features, which provide the focus for countless studies. For instance, electricity and gas prices may soar several magnitudes above their normal levels within a short time due to imbalances in supply and demand, yielding what is known as spikes in the spot prices. The markets are also largely influenced by seasons, since power demand for heating and cooling varies over the year. The incompleteness of the markets, due to nonstorability of electricity and temperature as well as limited storage capacity of gas, makes spot-forward