

Preface

The project that led to this book started in August 2011 when Matheus Grasselli proposed the writing of a monograph on the quantitative financial aspects of energy markets in a new collection launched by Springer: Springer Briefs. We quickly defined the scope of the book and the table of contents. But, this process would certainly have taken much longer without the opportunity given to me by Fred Espen Benth. Fred invited me to give a short series of lectures at the University of Oslo in September 2013 on electricity markets and derivatives. This commitment compelled me to create a large part of the material included in this book.

To fit the requirements of the SpringerBrief series, I chose the field of electricity derivatives. Electricity markets and prices have drawn the attention of academics from many different fields: economy, regulations, statistics, finance and mathematical finance. I skipped all of the regulatory aspects which nevertheless involved first-order economic questions as well as interesting mathematical modelling problems. I also overlooked the questions of price forecasting because exhaustive monographs on this subject already exist.

The book ranges from models which allow the tractable computation of futures prices to the valuation of storage and swing options, which are the most complex options to be evaluated in this market. My purpose is to give the reader a strong foundation in this field. Thus, I first provide an explanation of the main properties of electricity as a commodity and the main characteristics of the electricity market's microstructure. With these concepts, the reader is able to go through the whole zoology of stochastic models that propose to capture the dynamic of the electricity spot and futures prices. Then, I focus on the most important derivatives: spread options, tolling contracts, power plants, and storage and swing options. I also provide the reader with a description of the problems involved with the pricing of retail contracts and weather derivatives.

This book is intended on the one hand for applied mathematicians, statisticians and economists looking for a new interesting field of research. And on the other hand, for practitioners working in energy utilities or on the commodity desks of financial institutions.

I want to take this opportunity to thank the different institutions and persons that made this book possible. The first is the EDF group. As an employee of EDF, I was given the time and the resources to write this book. My successive managers trusted me, and without this trust I would not have had the chance to finish this book. Thus, I want to personally thank my manager, Marc Ringeisen, head of the EDF's Lab Osiris department. I also want to send special thanks to Bernard Salha, Head of EDF R&D, who agreed to write a foreword for this book.

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