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Economics of Electricity

Markets, Competition and Rules

Anna Creti

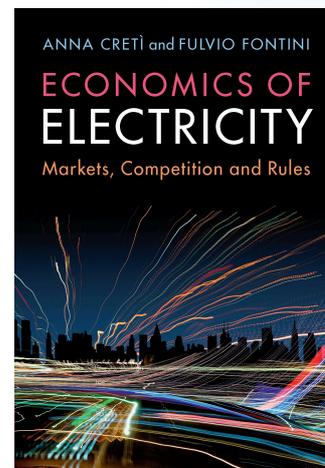
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This comprehensive and up-to-date book explains the economic rationale behind the production, delivery and exchange of electricity. Creti and Fontini explain why electricity markets exist, outlining the economic principles behind the exchange and supply of power to consumers and firms. They identify the specificities of electricity, as compared to other goods, and furthermore suggest how markets should be optimally designed to produce and deliver electricity effectively and efficiently. The authors also address key issues, including how electricity can be decarbonized. Written in a technical yet accessible style, this book will appeal to readers studying power system economics and the economics of electricity, as well as those more generally interested in energy economics, including engineering and management students looking to gain an understanding of electricity market analysis.

Introduction; Part I. Introduction to Energy and Electricity: 1. Basic principles, definitions and unit measures; 2. Introduction to electricity; brief history of the power industry; Part II. The Basic Design of the Electricity Systems and Markets: 3. The electricity systems and the electricity supply chain; 4. The four market designs of the electricity system; 5. Energy products and the time-dimension of electricity markets; 6. Some principles of regulation of the electricity sector; Part III. Simplified Isolated Markets without Network Congestions: 7. Load and power generation; 8. The centralized solution of optimal dispatching; 9. Welfare maximisation with time – varying load; 10. The market solution to optimal dispatching; 11. Balancing markets; Part IV. Competition in Wholesale Electricity Markets: 12. Wholesale market competition; 13. Market power in electricity markets; Part V. Introducing Transmission Networks: Network Congestions and Electricity Import-Export: 14. Electricity transmission: basic principles; 15. Meshed networks and congestion; 16. Transmission pricing in practice; 17. From nodal prices to transmission capacity expansion; 18. Transmission rights and price risk hedging; Part VI. Economics of Electricity Retail markets: 19. Retail competition: supplying electricity to final consumers; 20. Assessing the benefits of retail competition; Part VII. Investing in Power Generation: 21. Optimal investment in power generation; 22. Energy-only markets vs. markets with capacity remuneration mechanisms; 23. Capacity remuneration mechanisms; Part VIII. Environmental Challenges and the Future of Electricity Markets: 24. Global warming and the electricity markets; 25. Renewable energy sources and electricity production; 26. The integration of renewable energy sources in the electricity system; 27. Smart grids.



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'This book fills an important gap in the market for a graduate level textbook of electricity economics that sets out the physics, mathematics, economics and institutional elements needed to understand modern electricity markets. A mastery of this excellent text should provide a solid grounding to enable the student to understand, and ideally contribute to, the electricity economics literature, which can appear complex and daunting to even a well-trained micro-economist or electrical engineer.'

David Newbery,

*Director of the Energy Policy Research Group (EPRG),
University of Cambridge*



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