



Power Markets and Economics: Energy Costs, Trading, Emissions

By Barrie Murray

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It is now almost twenty years since liberalisation and the introduction of competition was proposed for electricity utilities. Some form of restructuring has been widely adopted around the world to suit local objectives. The industry now faces new challenges associated with global warming, rising prices and escalating energy demand from developing countries like China and India. The industry will have to cope with; managing emissions; managing variable energy sources like wind, developing clean coal technology; accommodating distributed generation and new nuclear stations and managing the impact of these developments on the distribution and transmission networks. It is now necessary to consider how the various market structures that were adopted have performed and how they will address some of these new issues and what further changes might be necessary.

This volume presents an all-inclusive analysis of the electricity market structures that have been adopted around the world and how they are performing. It provides an up-to-date analysis of the cost of competing technologies, the operation of energy and ancillary service markets and the impact of renewable sources and emission restrictions. It takes a forward look at likely future developments necessary to cope with the new emerging issues.

- Part One introduces industry infrastructure, analysing state utilities, the motives behind liberalisation and the resulting structures.
- Part Two considers generation costs, including renewable generation costs, and investigates the cost of restricting emissions as well as transmission and distribution costs.
- Part Three discusses market operation, describing how costs affect the organisation of power generation. It covers trading arrangements, ancillary services, international trading and investment.
- Part Four looks to future markets and technological developments that will shape the industry through the next twenty years. This includes the appraisal of investment opportunities for global power companies and implications for market performance.

Written by an internationally renowned consultant engineer, this book is full of

expert insight and balances fundamental methodology and academic theory with practical information and diverse worked examples.

This is an excellent reference on the topic for power system engineers, regulators, banks, investors, and government energy agencies. With its many worked examples, it is also a brilliant tutorial accessible for postgraduates and senior undergraduates in electrical and power engineering.

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Power Markets and Economics: Energy Costs, Trading, Emissions By Barrie Murray Bibliography

- Sales Rank: #4451613 in Books
- Published on: 2009-03-23
- Original language: English
- Number of items: 1

- Dimensions: 9.07" h x 1.05" w x 6.40" l, 1.45 pounds
- Binding: Hardcover
- 326 pages

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Editorial Review

Review

"This is a remarkable book which provides essential data for any informed discussion of this vital problem that is so often dominated by ill-informed debate." (*Oxford Prospect*, August 2009)

"Murray's overview of the link between engineering and economics in the energy sector provides a timely look at the big challenge for the global power industry.... [It] provides a sound bases for anyone involved in the wider debate on how the market should be shaped." (*Engineering and Technology*, May 2009)

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From the Back Cover

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About the Author

From the author:

I have specialised in power system development and economics for the last 40 years having worked for a distribution company and as a senior manager with a generator (CEGB), a transmission company (NGC) and a manufacturer (ABB). Prior to liberalisation I worked on the development of algorithms to optimise system planning and operation which led to my playing a lead role in the restructuring of the UK power sector in 1990. In 1998 I set up as an independent consultant with a company called 'Electricity Market Services Ltd' and published a book on early experiences with Wiley called 'Electricity Markets'. Since then I have worked on projects throughout the world. I have advised government agencies and regulators in Belgium, the UK, South Africa, Sri Lanka, Oman, Namibia and Abu Dhabi. I have analysed markets for clients covering the UK, France, Germany, the Netherlands, Spain, Italy, Ireland, Poland, the Czech Republic, Romania, Greece, Turkey, Scandinavia, the Ukraine, Russia and Kazakhstan, Botswana and Mozambique. I have also undertaken assignments in the US, Trinidad and Tobago and Singapore, for banks in Europe, the World Bank and for oil and gas companies. This new book is based on the experience and understanding gained from this wide spectrum of assignments and international experience. It shows how power costs can be calculated and compares those from conventional sources with renewable and other alternatives. It also includes detailed calculations of distribution and transmission charges showing the makeup of end user charges and the impact of emission restrictions. Part three discusses the operation of markets and how they may be analysed while part four speculates on future developments. I was encouraged to write the book and record my understanding and experiences by universities and others who recognised the shortage of books in this area. I have included worked examples and endeavoured to keep abreast of the latest developments. The industry continues to face new challenges and it remains to be seen how well the market structures put in place will be able to deal with them.

I originally trained as a power systems engineer with a first in Electrical Engineering. I subsequently took a Diploma in management Studies and completed a PhD in electricity markets. I am a fellow of the IEE, a senior member of the American IEEE and a member of the British Institute of Management.

Users Review

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