



Hedging Fixed Price Load Following Obligations in Competitive Electricity Markets

A Public Lecture by

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Abstract: This talk addresses the risk management problem faced by regulated load serving entities and marketers undertaking fixed price default service contracts, who must provide load following service at fixed regulated or contracted prices while purchasing electricity at volatile wholesale prices. The risk exposure of such entities is magnified by the inherent positive correlation between price and demand which results, under traditional fixed quantity forward contracts, in short positions when prices are high and long positions when prices are low. We developed a profit hedging strategy, using electricity standard derivatives such as forwards, call, and puts. The hedging portfolio is selected so as to maximize an expected risk averse utility function under self financing constraints. Our analysis shows that volumetric risk can be significantly reduced by using a static hedging portfolio consisting of price based instruments. We also explore the optimal procurement time of a static hedging portfolio under stylized price dynamics and show that the hedge performance is insensitive to contract timing up to a critical time after which the hedge performance deteriorates sharply. We also discuss an approximation method for VaR constraint optimal portfolio as an alternative criterion for a hedging strategy. (Based on joint work with Yumi Oum and Shijie Deng.)

Dr. Shmuel S. Oren is the Earl J. Isaac Chair Professor in the Science and Analysis of Decision Making in the Industrial Engineering and Operations Research department at the University of California, Berkeley. He is the Berkeley site director of PSERC – a multi-university Power System Engineering Research Center sponsored by the National Science Foundation and industry members. He has published numerous articles on aspects of electricity market design, planning and regulation and has been a consultant to various private and government organizations including the Brazilian Electricity Regulatory Agency (ANEEL), the Alberta Energy Utility Board (EUB), the Polish system operator (PSE), the Peruvian regulatory agency (OSINERG) and the electric power research institute (EPRI). He currently serves as Senior Adviser to the Market Oversight Division of the Public Utility Commission of Texas (PUCT), and a consultant to the Energy Division of the California Public Utility Commission (CPUC). He holds B.Sc. and M.Sc. degrees in Mechanical Engineering from the Technion in Israel and also an M.S. and Ph.D. degrees in Engineering Economic Systems from Stanford University. He is a fellow of the Institute of Electrical and Electronic Engineers (IEEE) and of the Institute of Operations Research and Management Science (INFORMS).

