The cost of restarting, shutting down temporarily and abandoning: An estimable dynamic programming model for peak power plants

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Abstract: This paper estimates costs associated with mothballing, restarting, abandoning and maintaining peaking power plants. We develop a discrete-time dynamic programming model to explain switching and maintenance behavior of plant managers. The constrained optimization approach to estimate crucial costs accommodates nonparametric dynamics for the expectations of the plant managers regarding future profitability. The empirical analysis is based on a database of the annually reported status of power plants to the United States Energy Information Administration (EIA) during 2001--2009. Our cost estimates imply so-called avoided cost rates which are less than the default rates used in the Pennsylvania-New Jersey-Maryland (PJM) Reliability Pricing Model capacity market, indicating that consumers may be overpaying for system reliability.

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Bio: Stein-Erik Fleten received the Ph.D. degree in business economics from the Norwegian University of Science and Technology, Trondheim, Norway, in 2000. He is currently Professor at the Norwegian University of Science and Technology, Trondheim, Norway, where he is doing research on electricity markets, hydro scheduling under uncertainty, hedging and risk management in electricity utilities, real options, and bidding in short-term electricity auctions. His main scientific fields are stochastic programming, finance and energy economics, with applications for electricity companies.