

DYNAMIC ELECTRICITY RETAIL PRICING IN UNCERTAIN ENVIRONMENTS

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The problem of optimizing dynamic electricity retail price for residential consumers is considered. A two stage retail market structure is modeled as a dynamic game between the retailer and the consumers. Based on the optimal demand response obtained from the thermal dynamic loads, the trade-off between consumer surplus and retail profit is characterized by a concave and non-increasing Pareto front. It is shown that each point on the Pareto front corresponds to an equilibrium point in the dynamic game with a particular payoff function, and any consumer surplus-retail profit pair above the Pareto front is not attainable by any dynamic pricing scheme. Effects of renewable energy are also considered.