In this paper, we propose a new real-time retail pricing model characterized by ex-post adjustments to exante price, and investigate the stability and efficiency properties of the ensuing closed loop system. Under this pricing mechanism, electricity is priced at the exante price (calculated based on predicted demand) up to the amount consumed at the previous time period. Any deviation of the demand from the previous time period is penalized or reimbursed at the ex-post price (calculated based on actual demand, after consumption). It is assumed that the exante and ex-post prices are calculated based on the aggregate consumption of the population. Therefore, although an individual consumer is a price-taker, he might adjust his behavior strategically based on the mean consumption of the population. Within this class of pricing mechanisms we investigate the social welfare and price stability properties. Simulation is used to show that the approximate dynamics with individual-mass interaction has better stability and robustness properties than pure exante pricing.

Stichworte:
Aggregate consumption; Competitive electricity markets; Economic efficiency; Market stability; New model; Price stability; Pricing mechanism; Pricing models; Real time pricing; Social welfare; Stability and robustness; Time-periods; Economic Efficiency; Market Stability; Real-Time Pricing