

Electric Energy Markets: Does the Market Send the “Right” Prices?

Tim Brennan

**Professor, Public Policy and Economics
University of Maryland, Baltimore County**

Senior Fellow, Resources for the Future, Washington, DC

brennan@umbc.edu

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What do we mean by the “right” price?

- **“Marginal cost” as the target**
 - Value of the last kWh used = cost of producing the last kWh
 - Presume value of the last kWh consumed = price
 - Ideal market => cost of last kWh produced = price
 - $P = MC$
- **Economic efficiency as criterion**
 - Leaves out non-economic objectives
 - Redistributive goals, e.g., low income subsidies
 - “Rights” to electricity
- **But what is left in?**
 - What do we mean by marginal cost?
 - Are there market failures?
 - Don’t forget regulatory failures

Does market power cause price to be too high?

- **Incentive to withhold to raise price**
 - Collusion alleged, more likely unilateral problem at peak periods
 - Capacity at limit; competitors cannot expand
 - Demand inelastic with fixed retail rates (more later)
- **But before leaping to conclusions, what is MC?**
 - Not just fuel costs for marginal unit
 - Cover costs of capacity to provide energy
 - Very high for peaking capacity used < 1% of time
- **Common error: $MC = AVC$ of peaking unit**
 - “Market power” studies
 - FERC regulations
 - Spurious rationale for separate capacity markets?

“External effects” more a problem

- **Environmental effects**
 - Price out with taxes, marketable permits
 - Both consumption, fuel mix effects (renewables)
 - Work better with markets, as generators bear costs
 - CO₂?
- **Energy security? Oil, maybe; electricity, not so much**
- **Reliability**
 - Nonstorability => Production = consumption all the time
 - Interconnection => Supply failure creates blackout everywhere
 - Reserve requirements? Reactive power?
 - Real-time pricing? Conservation subsidies?

The retail market

- **Real time pricing**
 - Average prices too high off-peak, too low on-peak
 - Too much peak demand, too little time-shifting
 - Inelastic peak demand promotes unilateral withholding
- **Not necessarily a market failure?**
Losses of buying high, selling low would encourage RTP
- **But perhaps: Blackout externality**
 - If supply < demand for me off peak, you get the power failure too
 - DSM, conservation subsidy rationale when on-peak $MC > P$
- **But do (residential) consumers want to be bothered?**
 - “If you like the 1040, you’ll love this”
 - **Implications for restructuring below**

The transmission side

- **Unbundling to keep “real” cost of access nondiscriminatory**
- **Cost recovery**
 - Distance related?
 - Postage stamp?
- **Congestion signals**
 - Locational marginal prices
 - Complex electrical interactions
 - Reveal disadvantageous production, consumption locations
 - Short-run dispatch, long-run generation construction
- **Asking prices to do too much?**
 - Short-run efficiency vs. incentives to expand capacity
 - **Who gets the congestion rents (even with unbundling)?**

Questions, not conclusions

- **Regulation wasn't necessarily better**
 - No incentives to control generation costs, MC too high
 - Rate averaging, peak costs hidden (wholesale and retail)
 - Overbuilding transmission?
- **But can markets work?**
 - Reliability without central planner?
 - Generation investment independent of transmission expansion?
- **A middle position?**
 - Jury out on wholesale markets, but guarded optimism
 - Industrial, large consumers can put up with retail
 - But give households a break: Regulated default service, for now