
MARGINAL COST PRICING HAS LITTLE PLACE IN ELECTRICITY REGULATION

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The California Energy Crisis

- May 2000 through June 2001
- Prices spiked in California's two central "clearinghouses" for wholesale electricity (California ISO, California PX)
- Cited reasons for the spikes are many, including low supply, high demand, and market manipulation
- Markets designed so that all sellers received the same price in each hour (or 10 minute interval)
 - This "market-clearing price" was the highest-priced electricity sold in that market in that hour (or interval)

FERC's Response to the California Energy Crisis

- Held that the market was not competitive
- Stated that generators should be willing to sell electricity at their marginal cost of production and, thus, the market should “clear” at the marginal cost of the least efficient generator
- Refunds ordered based on a proxy clearing price
 - Mitigated Market Clearing Price (MMCP) = Heat Rate x Market Gas Price + \$6.00
 - Heat Rate = incremental (not average) heat rate of least efficient generator located within California dispatched during the interval at issue

Problems with FERC's Response

- Assumption that the market will clear at the marginal price of the least efficient generator
 - This assumption will (may?) only hold true in perfectly competitive markets
 - Wholesale electricity markets are not perfectly competitive – and should not be expected to be so
- Even this assumption were appropriate, FERC's refund formula fails to determine accurately a generating unit's marginal cost
 - It is virtually impossible to determine a unit's marginal cost accurately

Electricity Markets are Not Perfectly Competitive

- Electric generation is a natural oligopoly
- Owing to capital intensive nature of electricity generation, market entry costs are far greater than zero
- Market entry is not instantaneous
- One should therefore not expect market prices to be close to the marginal cost of the least efficient generating unit producing power



Determining the Marginal Cost of Generation

- What is the “margin” anyway?
 - An additional MW of output within a given hour or maintaining production in the next hour at the same level?
- Did the unit need to start-up during the interval?
 - If so, start-up costs are “marginal” costs
- Does the unit have a minimum run time?
 - If so, costs incurred during the minimum run time are “marginal” costs
- Is the production function smooth or “chunky”?
 - If “chunky”, the additional cost of the entire incremental block is the “marginal” cost
- Markets operate on hourly or sub-hourly basis, but production decisions are often made on multi-hour basis

Impacts of Forced Marginal Cost Pricing

- Short-Run
 - Marginal generators will not bid into market because of fear of cost under recovery
 - Market supply falls, reducing market liquidity and increasing market prices
- Long-Run
 - Generators unable to recover costs on a regular basis will exit the market
 - Market supply falls, reducing market liquidity and increasing market prices
 - Owing to long lead times for generation construction, new supply will not enter the market for several years