California Independent
System Operator Corporation

Scarcity Pricing That Makes Economic Sense

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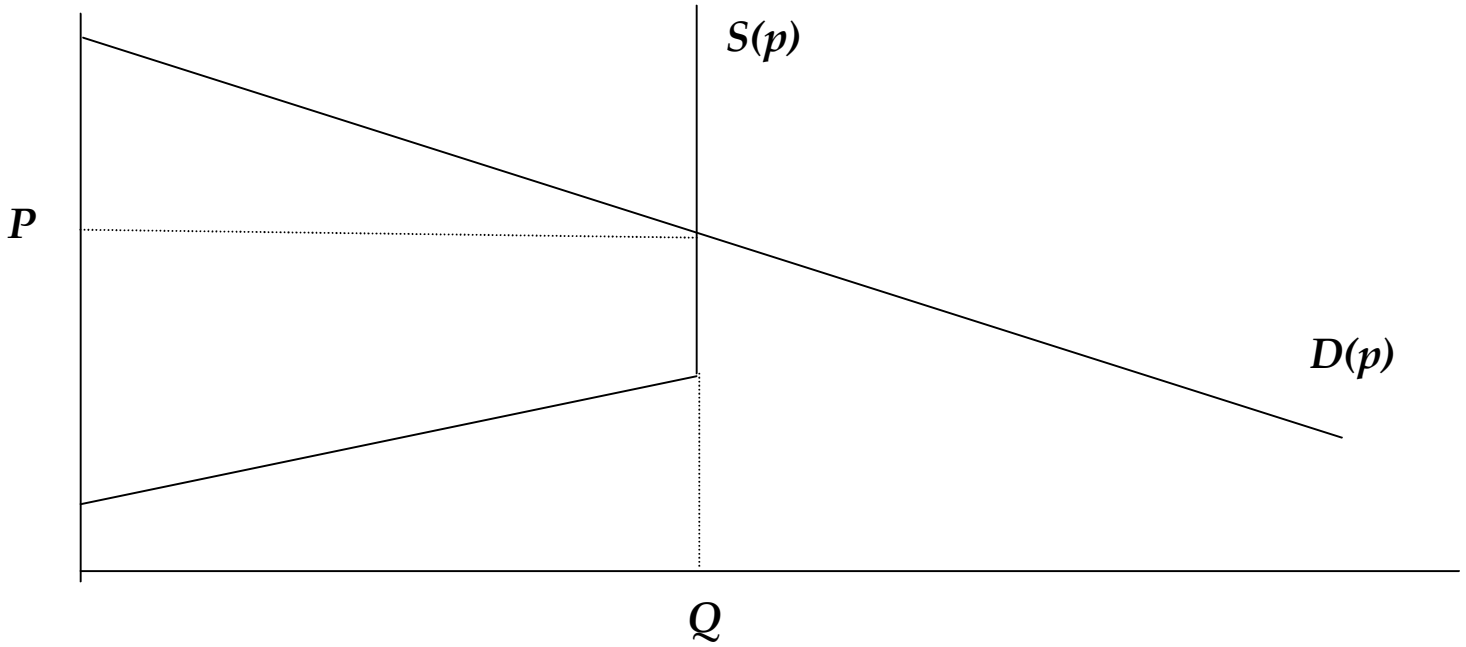
Outline of Talk

- **How scarcity pricing works in other markets**
  - Examples from airlines, sporting events
- **True scarcity versus artificial scarcity**
  - The trouble with administrative scarcity pricing mechanisms
- **How it should work in electricity markets**
  - Coordinating scarcity pricing mechanism with active participation of final demand in wholesale market
  - Avoid administrative mechanisms that
- **How it can work under MRTU**
  - Minimum quantity price-responsive demand bids into ancillary services markets

Scarcity Pricing in Other Markets

- **Downward-sloping demand curve allocates a fixed supply**
  - Airlines charge extremely high prices for tickets as flight begins to fill up
  - Tickets to sold-out events sell for more than list price



Distinguishing True from Artificial Scarcity

- **Cost of an administrative procedure based on system conditions to set "scarcity prices"**
  - Suppliers take actions to cause these system conditions to occur
  - Regulator-sanctioned form of exercising unilateral market power
- **Properly designed scarcity pricing mechanism should limit opportunities for suppliers to exercise unilateral market power in short-term market**
  - Use actual demand-side of market to set scarcity prices not an administrative procedure that can be manipulated by suppliers

How Scarcity Pricing Should Work in Wholesale Electricity Markets

- **There is a substantial amount of price-responsive final demand potential in all wholesale electricity markets**
  - Experimental results with real-time pricing at both residential, commercial and industry levels
    - Approximately 15 percent demand reduction on critical peak days in California
  - Requires interval or hourly metering to implement any form of real-time pricing
  - Customers on critical peak pricing (CPP) tariffs are ideally suited to participate in ancillary services and real-time energy market
- **A retailer that has a substantial amount of load on a CPP pricing plan can bid this load as non-spinning reserves**
  - Strike price for energy in real-time market can be set equal to CPP price
  - Retailer calls CPP event on days that energy bid of load is likely to be accepted

How Scarcity Pricing Should Work in Wholesale Electricity Markets

- **Demand curve used to set "scarcity prices" should be derived from willingness of customers to curtail load in response to higher reserve prices**
  - Retailers offer these demand reductions into non-spinning reserve market
- **Use of administrative demand curve for reserve market can result in reserve and real-time energy market outcomes that impose significant costs on consumers**
  - Very high scarcity prices can be set when many customers would have curtailed demand instead of paying these prices
- **Markets work best when intelligent and financially motivated supply competes against intelligent and financially motivated demand**
  - Market power problems arise when intelligent and financially motivated supply competes against administratively determined demand

How Scarcity Pricing Can Work Under MRTU

- **The ISO can mandate that all load-serving entities must submit non-spinning reserve ancillary services load bids at or below bid cap equal to at least 10 percent of day-ahead energy schedule**
  - Bids on energy must be at or below bid cap on real-time energy market
- **This builds in feasible amount of demand response into both ancillary services and real-time energy market**
  - Eliminates need for administrative mechanism to set scarcity prices
  - Demand bids will set high energy prices and load will be curtailed in real-time market based on willingness to curtail of loads
  - Scarcity pricing will function in a very similar manner to how it functions in all other markets
    - Willingness to pay of final consumers determines price at which available supply equals amount demanded at that price

Concluding Comments

- **Scarcity pricing existing in all markets with intelligent demand and supply**
  - No need for administrative scarcity pricing mechanism
- **Develop intelligent and financial motivated demand side of wholesale market**
  - Administratively determined scarcity pricing mechanism very likely to simply reward suppliers for exercising unilateral market power
- **Economically meaningful scarcity pricing that enhances market efficiency results from an active and intelligent demand side of wholesale market**