

Why Electricity Market Re-Design Is Required For

- 1. Fair Allocation Of Risks/Costs vs. Rewards**
- 2. Achieving Optimal Ex Ante Investment Decisions**

Harvard Electricity Policy Group

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Electricity Pricing Past & Present

OLD WORLD

- Electricity prices based on cost of providing the service
- Local Utility required to serve all customers and guaranteed a return on the infrastructure investment required
- Customers paid for the infrastructure and operating costs through rates/prices set by legal process
- Customers had the chance to review and challenge utility costs and the allocation of those costs between residential, commercial and industrial customers
- Utilities had little or no incentive to maximize efficiency, buy from lower cost neighboring systems or independent power producers
- Utilities rewarded for adding capital, regardless of regional needs
- Risks (capital allocation, forecast/planning accuracy and operational/efficiency) overwhelmingly born by customers

Electricity Pricing Past & Present

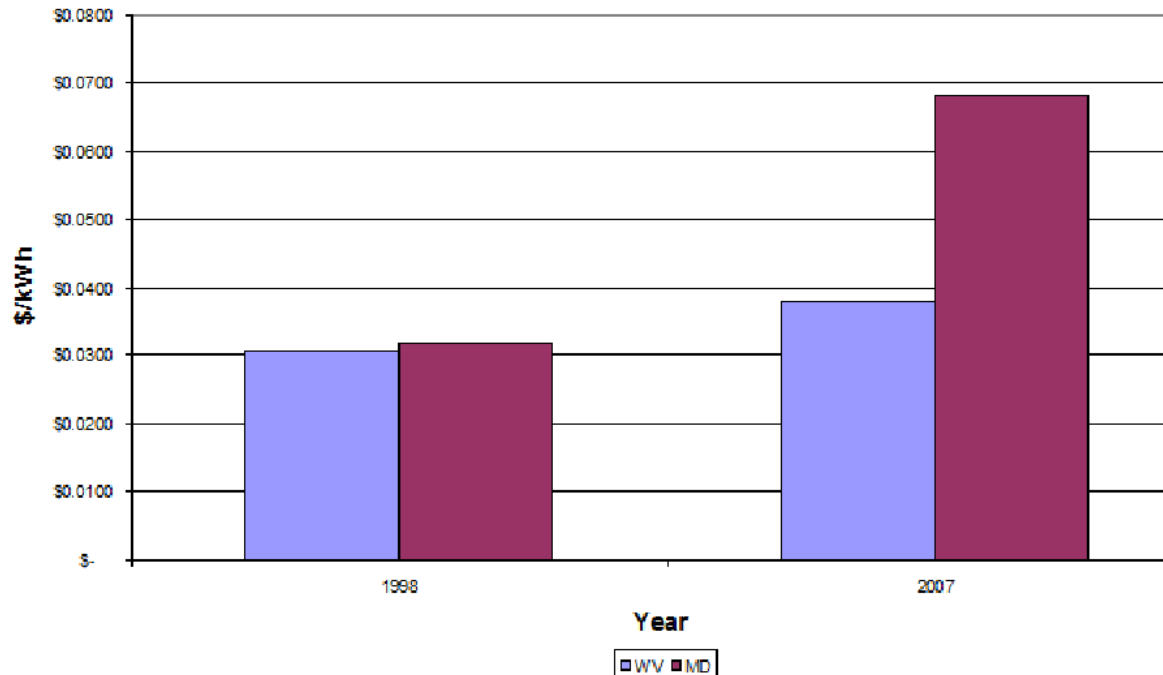
NEW WORLD

- Electricity prices set by regional “market” operator through administrative rate setting algorithms like a series of “no bid” contracts attempting to produce a market based outcome
- Prices based on supply offers of generation owners and system loads not related to actual costs
- Administrative capacity mechanisms add layer of costs with no assurance of returns for builders of new capacity
- No chance for customers to review offers or actual costs
- Owners of existing generation reap windfalls via infra marginal energy and capacity revenues
- Developers of new units may not recoup investments leading to low capital risk as the only investment alternative
- Risks (capital allocation, forecast/planning accuracy and operational/efficiency) still predominantly born by customers but also by new entrants
- Costs have increased well beyond any reasonable measure of “just and reasonable”
- Akin to creation of “electricity market design tax”

What Happened To Just and Reasonable?

Comparing APS Rate PP in MD vs WV, the only reason for the current difference is that the current dysfunctional PJM market design sets the price in MD while the WV rate reflects fully bundled cost of service as of June 2007. Effectively MD consumers pay an “electricity market design tax” to generation owners vs. what WV customers pay.

APS Rate PP in WV vs. MD



What Do Customers Want?

- Just and Reasonable outcomes
- Integrated regional generation, transmission and demand side forecasting and coordination by an independent entity on a least cost basis consistent with reliability objectives
- Real competition between resources and between providers of resources in the procurement process
- “Finance able” long term contracts or FERC approved Tariff based recovery for new and necessary existing resources that assure returns to investors but also provide price stability for consumers
- Broad regional economic dispatch of the resource pool on a cost basis

Forward Locational Capacity And Energy Procurement Market Elements

- RTO/ISO to perform annual forecast model and develop annual plan integrating generation, transmission and demand side resources in coordination and cooperation with state processes
- Standardized Forward Locational Capacity Procurement with corresponding unit specific energy offers (essentially a call option on the output of each unit) held annually 3 years forward for peaking and intermediate capacity and 6(+) years forward and for base load capacity
- Demand Response treated essentially as peaking capacity with capacity offer and energy strike price
- Incremental procurements held annually until delivery year for load growth and reserve requirements (predominantly from peaking units, new or existing and demand response)
- RTO/ISO to define load pockets based on analysis of transmission constraints and assuming requested generation retirements, transmission upgrades and previously selected generation resources
- Locational deliverability necessary to the pricing zone making the capacity payment, but with new generation having the same access to transmission capacity as existing generation allowing market to clear the lowest bid resources without the current preference for existing assets

Forward Locational Capacity And Energy Procurement Market Elements (cont)

- No caps on capacity market offers but all generators must offer (local market power mitigation might still be necessary in some load pockets due to concentration of ownership of generation resources)
- Bilateral transactions and self supply (including curtailable loads) allowed and offered at a \$0 price to allow the auction process to include all capacity resources in deliverability calculus
- RTO/ISO selects among call option offers based on developing a least cost supply plan for the forecasted needs
- RTO/ISO procures 100% of forecast peak load in procurement process but would procure only 1/3rd of reserve requirement in the first forward round, adding an additional 1/3rd in each subsequent procurement round until the procurement prior to the delivery year
- RTO/ISO tariff to enable long term (10, 15, 20 years?) revenue recovery with selected “Capacity Resource” in each round with the capacity price fixed for the duration of the commitment period and the energy provided on a cost based pass through basis
- Capacity cost allocation based on actual zonal deliverability at time of RTO/ISO peaks for zonal capacity revenue collection purposes

Forward Locational Capacity And Energy Procurement Market Elements (cont)

- Energy cost allocation based on capacity payments and actual deliverability for zonal energy revenue collection purposes
- Capacity payments adjusted for forced outage rate or actual unit performance causing poor performing units to be de-rated in the same manner as current RTO/ISO processes
- DA and RT balancing energy markets still necessary and operated the same as today except for payment stream to units receiving capacity payments
- Capacity payments treated as call option on energy at cost plus 5% strike price for any portion of capacity receiving a locational capacity payment
 - Liquidated Damages for non performance of energy delivery.
 - May accept fuel index to set future energy strike prices.
 - Tie to call on energy is a financial transaction administered and offset by RTO
 - LMP day ahead and real time markets unaltered for non committed resources