Restructuring Wholesale and Retail Electricity Markets in the U.S.*

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XIII Seminario Repsol YPF ~ Harvard
Salamanca, Spain, May 10, 2003

*Lessons from the bleeding edge of electricity restructuring . . . .
Outline of Presentation*

- Why did we begin restructuring electricity markets in the U.S.?
- What happened and why?
- What lessons can be learned?
- Appendix: A few fundamentals about electricity

*The views expressed here are my own and do not represent the views of the Tennessee Valley Authority.
Why deregulate?

- **The problem:**
  - Electricity prices were high (2-3 times market) in high-cost states
  - Management and/or regulatory mistakes were perceived to be the problem

- **The hope** – that competition in generation would:
  - Shift the cost of management mistakes and forecast risk from customers to suppliers
  - Reduce the role of regulation
  - Lead to greater innovation
  - Result in lower overall costs over the long run
Deregulation -- What happened?

- By the late 1990’s, roughly half the states had opened retail markets to competition, or were planning to do so.
- On the eve of deregulation in the Northeast and California:
  - Wholesale market prices were roughly 2¢/kWh compared to embedded generation costs of 6-7¢/kWh.
- After deregulation:
  - Market prices stayed low for the first few years.
  - Beginning in June 2000, California began feeling the effects of a severe capacity shortage, which coupled with the worst market design in the country, drove prices up -- waaaaaay up!
Day-ahead electricity prices (CA and New York) Jan 00 - Jan 01

Source: NYISO MIS 3/1/01; UCEI Berkeley web site
What happened and why?

Three categories of issues have challenged restructuring efforts in the U.S.:

1. **The Money Issues** – Who pays and who benefits?
2. **The Technical Issues** – What does it take to design wholesale and retail markets that work?
3. **The Institutional Issues** – Who’s in charge?
   - Regulatory jurisdiction
   - Ownership – public vs. private
The Money Issues

Circa 1996

- **Major Issues:**
  - Who would pay for stranded costs -- the above market costs of sunk utility investments?

- **Rarely Mentioned:**
  - Market infrastructure costs
  - Who will pay for new investment in transmission?


- **Largely resolved:**
  - Stranded costs

- **Major Issues:**
  - In high-cost regions:
    - How can we protect small customers from high market prices?
    - How can we get larger, regional markets?

  - In low-cost regions:
    - How can low rates be retained?
    - Will benefits of competition exceed the costs?
    - Will native load be forced to pay for transmission investments needed to benefit high-cost regions?
The Technical Issues – wholesale markets

Circa 1996

- **Major Issue:**
  - Should transmission operations be integrated with a short-term market?
  - Advocates limited to New York and PJM* (and Bill Hogan)
  - Opponents argued for separation under the slogan “No PoolCo” and prevailed in California
  - Faced with little consensus, FERC** let different regions experiment

- **Rarely Discussed:**
  - How to get meaningful demand response
  - How to mitigate market power


- **Largely Resolved:**
  - When rules don’t reflect underlying reality, gaming can cause catastrophic results when systems are under stress
  - Core features of workable wholesale markets
    - Independent operation of transmission, integrated with
    - Voluntary energy spot markets
    - Location marginal pricing
    - Financial congestion revenue rights

- **Major Focus of Attention:**
  - How to get meaningful demand response
  - How to mitigate market power

*PJM = the Pennsylvania, New Jersey, Maryland system. **FERC = the U.S. Federal Energy Regulatory Commission.
The Technical Issues – retail markets

Circa 1996

- Major issues
  - All customers had to have access at once
  - Rules focused on
    - Mechanics of retail access
    - How to “jump start” the market
      - Handicapping the incumbent
      - Subsidies to switch
  - Small customers needed price protection and choice at the same time

- Poorly understood
  - Economics of commodity retailing for small customers
    - Small loads
    - Thin margins
    - High transactions costs
    - No value-added services to offset higher costs


- Largely acknowledged
  - Poor economics for small customers
  - Retail market issues pushed too fast
  - Wholesale market issues should have been resolved first

- Major issues
  - Regulators reluctant to remove price protections for small customers
  - A mixed system makes more sense
    - Keep small customers on regulated service
    - Move large customers to market
  - How do we get there?
    - Politically embarrassing to roll back reforms
    - New legislation required in most states to implement changes
Institutional Issues – who’s in charge?

- Jurisdictional issues are still a problem
  - FERC
    - regulates “interstate” and “wholesale” sales
    - Can order utilities to build new transmission
  - States regulate
    - “intrastate” and “retail” sales
    - siting of transmission lines
    - recovery of 90+% of transmission costs
  - The legal distinctions (wholesale/retail and inter/intrastate) bear no relationship to power markets or the physics of the grid
- In most states, public power entities are self-regulated (munis, coops, federally owned)
- Given the lack of consensus on what should be done, jurisdictional and institutional conflicts create barriers to restructuring
General Lessons Learned from U.S. Restructuring

- We’ve made real progress – but it’s hard to tell from all the shouting
- Wholesale markets can work, but whether it’s worth the effort depends on where you’re starting from
- It’s harder than many of us thought it would be at the outset
- Four specific recommendations follow
Lesson No. 1: Manage Expectations

- Do not exaggerate the benefits of restructuring
- Recognize that everybody cannot be made better off relative to the status quo
  - Markets create winners and losers
  - Some customers are subsidized today – expect their costs to go up
  - Prices go down and up
- Do not understate the costs: free markets aren’t free
  - Costs to set up markets are substantial
  - Benefits occur over the long run
  - There are no windfall gains to be had – unless someone experiences a windfall loss
Lesson No. 2 – Get the technical details right

● Don’t try to proceed with a “fire-ready-aim” approach
  ● Small details can kill you
  ● Learn from the mistakes and successes in other markets

● Getting the wholesale market design right should be the highest priority. If the wholesale market is working well:
  ● Access for large customers is relatively easy
  ● Benefits accrue to small customers, even if they don’t have choice
Lesson No. 3: The role of retail markets

- You need **some**, but not all retail load participating in wholesale markets to help markets clear and mitigate price spikes
- **Do** put large (>1 MW) customers into the market
- **Don’t** put small customers into the market, at least not at first
  - Economics are ugly
  - Political pressure is too great when market prices are high
- **Do** recognize you can’t have it both ways
  - You can’t have a well functioning market and price protection at the same time
  - If customers need “protection” from high market prices, they shouldn’t be in the market in the first place
Lesson No. 4: Develop a realistic plan for dealing with institutional issues

- Do an assessment of the issues
  - Will some regions benefit more than others?
  - What stakeholder groups will win and which will lose?
  - Who gets to decide whether, when and how to move forward?

- Develop a plan
  - If interests conflict, who will drive the process toward resolution?
  - How will winners be able to educate/persuade/bribe losers to participate?
Appendix -- A few electricity fundamentals

- **Electricity cannot be stored economically**
  - Reliability is achieved through an integrated network of generation and transmission assets (the “bulk power system”)

- **Customer demand is relatively unresponsive to price in the short-term**
  - **Wholesale**: little demand response in the wholesale spot market (timeframes are too short)
  - **Retail**: Most customers are protected from market prices through a regulated service options (so customers can’t benefit by responding, even if they wanted to)
A few electricity fundamentals . . .

- **New supplies cannot be added overnight**
  - It can take 3-5 years to site and build a new gas plant; even longer for coal or nuclear

- **The results are that:**
  - Electricity spot markets are many times more volatile than any other commodity
  - Short term markets conditions can create market power
  - Electricity is inherently subject to
    - Enormous forecasting errors, and
    - “boom and bust” price cycles
When supplies are tight, both the supply and demand curve can be vertical, leading to price spikes when supplies are short.

Forecast Load: 20,373 MW
Actual Load: 19,454 MW
LBMP (Marcy): $56.40

Source: NYISO website