What Price for Price Response?

Harvard Electricity Policy Group

20 May 2010
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Energy System modeling, analysis, expert testimony, and stakeholder representation for...

- Consumer Advocates and Public Interest Groups in more than 25 states
- More than 20 PUCs and Attorneys General
- Over 40 Environmental Groups and Foundations

- NEPOOL Representation for Consumer Advocates, Energy Efficiency and Renewable Generation
Benefits of Price Responsive Demand

• Direct Monetary Savings
  – Short term energy costs
  – Long term energy costs
  – Market power mitigation
  – Market efficiency (posturing, removal of price caps?)
  – Capacity costs
  – Transmission & distribution costs

• Reliability
  – Demand responds when dispatched, not by guessing
  – Reaction speed (i.e., ramp rate)

• Environmental
  – Avoid peak emissions
  – Integration of additional wind, solar, hydro
Environmental Benefits – One Example

Figure 5-9: NOx emissions by fuel category on the 35,000 MW peak-load day for Scenario #2 (energy efficiency and demand response) common-assumptions case, tons/hour.

Central Question about PRD

Do We Have Enough?

*Hint: Nearly 1,000 MW of RTDR have a capacity obligation in June 2010. Average hourly response in DALRP in 2010 is below 12 MW. Maximum response in any one hour was 14.3 MW. Data similar for summer 2008 and 2009.*
Does it make sense that we consumers – ratepayers – pay so much for electricity? If gasoline went to $50 for an hour, nobody would buy it.
Something’s not working.

Narrowing our focus on the top 5% of hours exaggerates the problem.
If reality is not matching our theory, then we must adjust our theory.
Why No PRD?

• Barriers to PRD in energy markets
  — Time, Capital, Knowledge, Tools

• All of load is not a single block

• Key requirement for any individual customer is: please serve my load as cheaply (reliable, clean) as possible

• Demand Response providers are offering to provide this service, and in some hours offering to do this cheaper than the next increment of generation. So I would buy it.
How Much Should I Pay?

• LMP? LMP-G? LMP-G+X? LMP – (G+T&D)?
  – LMP is marginal cost to serve next increment of load
• Customers want to pay all of supply as little as possible to serve my load, of course
• As an individual customer, I’m happy to pay other loads full LMP to reduce.
  – If they make my purchase cheaper (clean, reliable)
• Clearly LMP minus Retail Rate isn’t enough. History shows very little PRD at this pay rate.
• If full LMP is ‘overpaying’ them, then competition should drive down the price of PRD
Consequences to Paying LMP?

• Competition can achieve lowest long-term energy cost better than a monopoly
  – We are buying a service (reliable electric power delivery) not a product (MWh)
  – LMP has proven itself good at economic dispatch (not perfect)

• LMP is not a good indicator of new generation investment or retirement

• Would we get too much PRD?

• Inframarginal rents

• Having a market is not the point
  – Lowest long-term cost to consumers is the goal
Paying LMP to PRD Still Works

- All suppliers paid single clearing price LMP
- If PRD clears, total cost of supply distributed over fewer MWh of actual load (i.e., billing units)
- Simple algorithm to determine if total cost to load is lower
  - No “missing money”
  - No cost allocation issues
But what about Smart Grid!

- **DR Providers**
  - Provide a service to the end use customer (TKCT)
  - Need revenue stream to run their business
  - Dispatchable by the control room
  - Existing model of shared savings not working
  - Paid LMP

- **Technology**
  - Has great potential
  - Will replace service provider where cheaper and easier
  - Not available today
  - Will never satisfy all niches
  - Not dispatchable by the control room
  - Save energy and perhaps demand costs
Conclusions

• We need to stop wasting ratepayer money
• Economic theories should guide us, but not constrain us from reality
• DR providers can fill an important niche
• Entirely appropriate to pay full LMP, as long as my load is served cheaper (clean, reliable)
• Energy market billing and payment systems are fully capable of the mathematics
Thank You

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