LMP in PJM: Is it Working Yet?

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Dr. William Hogan, the consultant largely responsible for introducing "locational marginal pricing" (LMP) into the restructured PJM Interconnection, recently issued a paper interpreting "dry run" simulated price data collected just a few days before the new market structure was implemented in the PJM. Dr. Hogan concludes that the data support the superiority of LMP, implemented at multiple system nodes, over a simpler approach using natural zones where prices vary together. According to Dr. Hogan, the new PJM is indeed working, "knock on wood." (Electricity Daily, April 3, 1998).

Those actually participating in the market apparently do not share this rosy view. The April 3, 1998, edition of Restructuring Today, characterized market response to the April 1 launch of LMP in PJM as "pandemonium," resulting in market participants threatening "a flood of lawsuits against FERC" over a system found to be "non-workable."

A closer look at the data reveals a number of flaws in Dr. Hogan's interpretation. First, the data on which he bases his conclusions were generated before April 1, when the market neither received the price signals nor had the ability to respond to them. Second, the two single hours he chose to analyze reflect an aberrant combination of scheduled, localized equipment outages, and unseasonably warm weather.

Even the most optimistic market participants will likely prefer to evaluate the PJM experiment based on its performance after the experiment has actually started. The real proof will emerge from how the system works during summer or winter peak load conditions, when transmission congestion will be at its worst, and dominated by forecastable constraints.
Nevertheless, now that the new PJM market has been in operation for one week, a dispassionate look at the price data from actual operations still offers no support for Dr. Hogan's premature claims.

After inspecting simulated and actual locational prices published by the Office of the Interconnection for the period March 24 through April 6, analysts at Tabors Caramanis & Associates found that during this 336-hour period, congestion appeared during 98 hours, all occurring before April 3. For half of these hours, congestion was relatively insignificant. For the other half, the constraints that produced diverse prices across locations were caused by the combination of localized equipment outages and unseasonably warm weather. Because both factors are unforecastable, under LMP, market participants have no means to protect themselves from resulting spikes in the nodal prices assessed against them. The accompanying graph shows the coincidence of nodal price deviations with (i) major equipment outages, (ii) intermittent outage-related local constraints, and (iii) temperatures 25 Fahrenheit degrees higher than normal.

This data begs the question — a question that many involved in PJM restructuring have asked before — what is the value of a pricing scheme that exposes market participants and consumers to random, localized, and unhedgeable price fluctuations. Fluctuations of this type have consistently accounted for about half of total congestion costs in the PJM. While it is much too early to evaluate conclusively PJM's new market structure, one conclusion can be drawn from the limited reported data on locational prices. Had a zonal congestion pricing system been implemented, one in which the costs of unforecastable, intrazonal congestion are allocated proportionately to all grid users, the new PJM would have achieved economic efficiency without triggering market pandemonium.
PJM East Nodal Hourly Prices, Nodal Price Variation, and Temperature Profile, March 24 - April 6, 1998