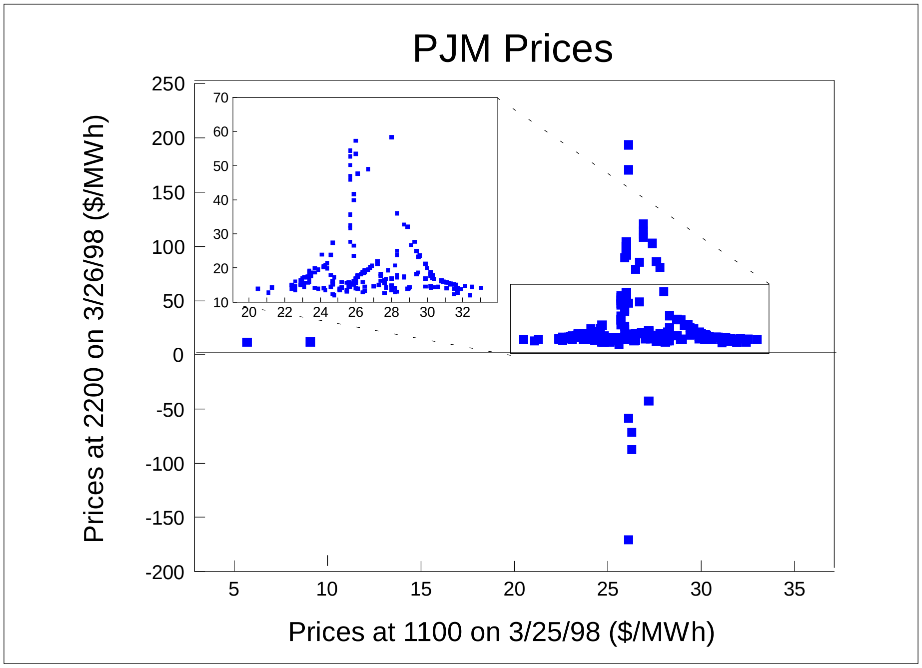
Getting the Prices Right in PJM

Just before the April conversion to the use of locational marginal cost prices, the PJM system produced data that address two questions. Is transmission congestion insignificant? Are there only a few zones with meaningfully different prices?



For most hours in recent weeks, there has been no transmission congestion and no difference in marginal costs across locations. However, what is important is the degree to which locational marginal costs differ when the system becomes constrained. On March 25 and 26, the system became constrained in different ways.

A plot of the prices for each location for two of these hours (1100 on 2/35/98 and 2200 on 3/26/98, from the PJM web site) illustrates what the PJM system operator has been saying. First, when constraints bind, there can be large differences in marginal cost based prices. At one point, several locations had large negative prices, indicating the value of counterflow. The difference between the highest and lowest prices on 3/26/98 was almost $400 MWh, reflecting the marginal cost of transmission between these points. Of course, no market participants actually paid these prices, so they had no incentive to adjust their use of the system. This forced the system operator to run the grid in a way that few would really want, if they had to pay for the costs they imposed. Presumably, the market will moderate this type of extreme outcome, when everyone has to pay.

Second, there do not appear to be any natural zones where prices are always the same across locations. If there were a few such zones, the graph would show a few clusters of prices. The spread of prices and the different patterns in just two different hours are consistent with the reality of the transmission grid, but are inconsistent with the zonal hypothesis. The PJM hubs may moderate price volatility over time, and facilitate the market. However, prices can differ across the system, and these locational price differences could matter a great deal. It will be interesting to see how the market adjusts to reflect these marginal cost differentials when prices reflect costs in constrained situations.

W. Hogan, 4/7/98