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Dr. Faruqui and Dr. Eakin are co-editors of the forthcoming Pricing in Competitive Electricity Markets, *due from Kluwer Academic Publishing.*

Mitigating Price Spikes in Wholesale Markets through Market-Based Pricing in Retail Markets

Introducing a modest number of spot-based products into the retail portfolio would provide significant price relief and stability by connecting the retail and wholesale markets in a cost-effective and market-based manner.

Douglas Caves, Kelly Eakin, and Ahmad Faruqui

In late June 1998, wholesale electricity prices in the midwestern United States reached unprecedented levels in the neighborhood of $7,500 per MWh for a few transactions. A staff report by the Federal Energy Regulatory Commission concluded that this "price spike" was caused by an unlikely coincidence of supply-restricting events [unit outages and transmission congestion] with demand-enhancing events [hot weather].[1] An additional factor was the inexperience of market participants with electricity trading. The report suggested that these events were sufficiently unique that they were unlikely to recur. However, an even greater price spike of around $10,000 per MWh was observed in late July 1999. The highest prices again occurred in the Midwest, but this time unexpected supply constraints, buyers' panic, and trader default were conspicuously absent.

Clearly, something else is causing the spikes in wholesale prices. In our analysis of the June 1998 price spike, we emphasized that the price spike was caused by the disconnectedness of the wholesale and retail markets. We believed then, and still believe, that the more relevant question is "why did prices stop rising?" Specifi-

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cally, we wrote that because "wholesale rates are largely divorced from retail customer value . . . there is no reason that wholesale prices should necessarily cease to rise even at levels experienced on June 24 and 25."[2]

The disconnection between wholesale and retail electricity markets arises because most retail customers are sold electricity on a guaranteed-price basis, since they buy electricity from a regulated utility that is operating under an "obligation to serve" franchise. Selling power to retail customers under this arrangement insulates them from demand–supply imbalances that arise in the wholesale market, and effectively removes any price-induced demand response from restoring equilibrium to the wholesale power market.

As we will show below, an energy services provider (ESP) that sells even a modest fraction of retail load at spot-based prices can hedge a considerable amount of the wholesale price risk. In fact, an ESP with spot products in the portfolio of retail products may actually profit from wholesale price volatility. For the industry, having a fraction of retail load sold at spot-based prices can mitigate price spikes and reduce overall volatility in wholesale prices. By offering retail customers some choice of spot-priced products, the industry can move more quickly toward efficient and effective competition.

This article updates our analysis of the June 1998 price spike in light of the July 1999 spike. It re-emphasizes three conclusions. First, the disconnection between wholesale and retail electricity markets (and the market and institutional arrangements leading to this disconnection) is the fundamental cause of the price spikes. Second, the introduction of voluntary spot-price products in retail markets would significantly dampen wholesale price volatility. Third, market-based pricing of all retail products will facilitate the transition to smoothly operating electricity markets with normal price volatility.

I. The Economics of Price Spikes

Figure 1 shows the highest hourly trade prices on June 24 and 25, 1998, in the Mid-America Interconnected Network (MAIN) reliability region. A similar pattern of price spikes occurred on July 29 and 30, 1999.

Interestingly, both of the price spikes have been most severe in the Midwest. Perhaps this is because the heat waves that do occur raise the temperature well above the summertime average for this region. Other regions of the country are either not as prone to heat waves or are already responding to hot weather. That is, heat waves may create a larger demand shock in the Midwest than elsewhere. Nevertheless, the same price volatility problem may recur in other regions because the underlying cause is not the extreme weather conditions, but the inadequate market design that impedes the ability of prices to convey information about demand–supply imbalances to market participants.

Table 1 summarizes the six principal factors that contributed to the June 1998 price spike. Only two of these factors were present in July 1999.

In July 1999, hot weather shifted the demand curve to the right, and created a market shock. This shock was magnified several times because retail and wholesale mar-

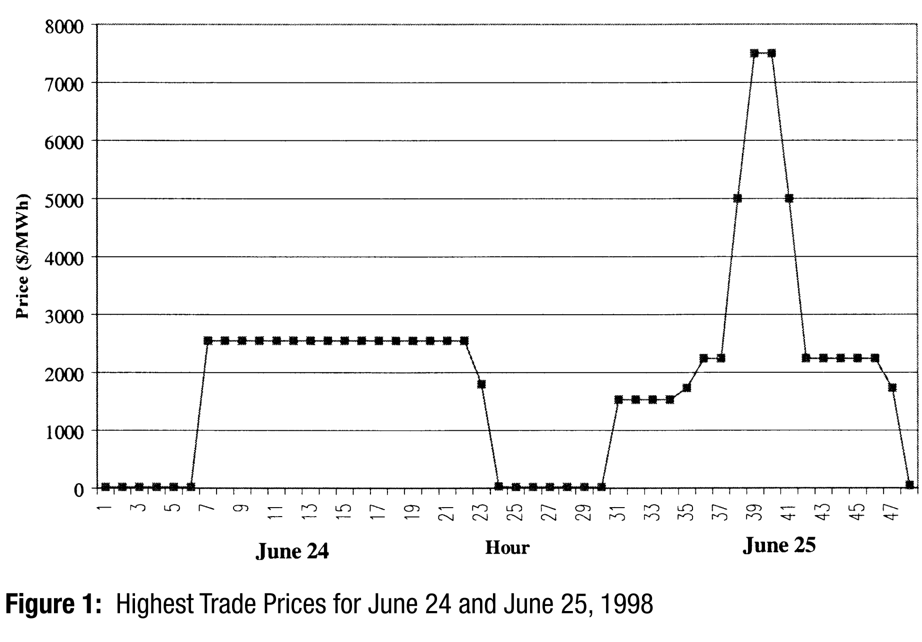

Figure 1: Highest Trade Prices for June 24 and June 25, 1998

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