

Competition in Germany's Minute Reserve Power Market: An Econometric Analysis

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This paper provides an empirical evaluation of the benefits resulting from two important regulatory changes in Germany's minute reserve power markets. The first regulatory change focused on the synchronization and standardization of the four control areas in Germany, when a common web-based tendering platform was launched for minute reserve power (MRP) on 1 December 2006, and for primary control power (PCP) and secondary control power (SCP) one year later, on 1 December 2007. The aim of this reform was to foster competition and to increase efficiency by facilitating market entry and by reducing incentives for strategic behaviour. The second regulatory change obliged the four German transmission system operators (TSOs) to gradually interconnect and to coordinate their operations. This reform solely tackled the inefficient use of reserve capacities without directly affecting the competitive process.

We demonstrate that the launch of common web-based tendering platforms for PCP, SCP, and MRP (the first reform) has clearly been successful in decreasing MRP prices. In contrast, TSO interconnection and cooperation (the second reform) had rather mixed effects, having either no impact or even an adverse effect on MRP prices (i.e., leading to higher MRP prices). Overall, we still find that the reforms were jointly successful in decreasing MRP prices, generating savings of roughly 1950m Euros for incremental MRP and of and 1400m Euros for decremental MRP expenses. Moreover, the first reform of 1 December 2006 should have also positively affected wholesale market competition. Since the wholesale (day-ahead) spot markets and MRP markets are, at least partly, substitutes for generators, it is reasonable to suppose that synchronization and standardization reduced generators' incentives for strategic behavior.

In contrast to previous literature, the present paper uses a unique panel dataset to account for unobserved heterogeneity between the four German regional markets. Moreover, we control for endogeneity by using weather data as instruments for electricity spot market prices. In a first step, we have applied time series techniques to examine whether the reforms changed the interrelationships between the MRP price series of the four regional German control areas. We find strong evidence for interrelationships via Granger causality testing between all incremental MRP prices after the first regulatory reform was implemented. However, decremental MRP prices have apparently not been affected. The regulatory changes had no measurable effect on the relationship between decremental MRP prices suggesting that the control areas remained partly distinct.

In a second step, we have used a unique panel dataset to check whether the reforms were successful in decreasing both incremental and decremental MRP prices taking account of possible endogeneity problems caused by wholesale spot market prices using, instrumental

variable techniques. Due the special structure of our dataset, we are able to test whether the different regulatory changes caused shifts in the price time series via dummy variables. We calculate the effects of single reforms as well as the joint effects of the two reforms.