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# RESTRUCTURING ELECTRICITY MARKETS

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As the director of the Penn State Electricity Markets Initiative, a great deal of my research involves the "restructuring" of electricity markets in several U.S. states and countries around the world. In contrast to the deregulation of the airline and trucking markets, for example, electricity restructuring has proven to be quite complicated for the following reasons:

i. "Restructuring" means that the generation and retailing of electricity are subject to market forces, while transmission and distribution of power, because they appear to be natural monopolies, remain regulated by state and federal governments. Thus, regulation and competition must exist together in one industry, sometimes in an uncomfortable fashion.

ii. The advocates of restructuring argue that it causes lower retail prices as electricity markets open to many competitive retail suppliers. Lower prices should cause ratepayers (consumers), seeking to capitalize on better pricing options, to change their electricity providers. In practice, while commercial and industrial consumers respond, residential customers often seem disinterested in switching to competitive suppliers. Therefore, even with substantial savings available, the advantages of restructuring are not being realized by residential consumers.

iii. Political support of restructuring is limited because of the 2000-2001 meltdown of California's restructured market. The flaws in the restructuring of that market have

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been studied extensively, leading to a greater understanding of the means for their correction or avoidance in future restructurings. However, political opponents point to the problems in California to argue against any restructuring plan.

iv. Support for restructuring can also wane in the face of increasing input energy prices. In restructured markets, when energy input prices rise, those increases are quickly reflected in higher electricity prices. In regulated markets, these increasing input costs are largely put off to be paid by future ratepayers. Seeing the disparity between high prices in restructured markets and low prices in regulated markets, legislators threaten to pass laws to go back to the "bad old days" of regulation. Today, as input energy prices have receded from their highs, the difference between rates in regulated and restructured markets has largely gone away. In the future ratepayers in regulated markets will still have to pay for recent energy input price increases that have already been paid for by consumers in restructured markets. Even today, however, legislators in New Jersey and Maryland are intervening in generation markets, with potentially disastrous results.

Notwithstanding these complications, restructuring has seen important successes. These successes stem from the fact that under restructuring investors in energy generation receive both the costs and benefits of efficient generation operation. In contrast, regulation transfers operational and financial risks to ratepayers, while essentially guaranteeing a return to investors in energy generation.

Restructuring has led to a 10-15 percent increase in the efficiency of thermal (natural gas and coal) generation and greater capacity utilization in nuclear generation. Fifteen years ago, nuclear power looked like a dying industry. Most nuclear power plants ran at 50 to 60 percent of

capacity and were worthy targets of humor on *The Simpsons*. Today, nuclear power plants run at capacity levels in the mid-90 percents, and nuclear power represents a crucial part of the U.S. electricity grid.

Most important, restructuring has taken away the public promise to pay for the costs of poor investments in generation. These promises resulted in cost overruns of over $100 billion in the construction of nuclear power plants in the 1970s and 1980s. Those of us who live in restructured states such as Pennsylvania do not have to worry about having to pay for such costs again.

Restructured states are also well suited to meet the challenge of adapting to clean sources of electricity. Bringing large quantities of wind and solar power on-line will require a great deal of innovation, and restructured markets will reward such innovation. In states with regulated electricity markets, the implementation of green innovation may be bogged down in bureaucracy and red tape.

Restructured markets are also on the verge of dealing with another major problem in electricity markets – the lack of "peak-load" pricing information. The wholesale price of power can fluctuate wildly during the day, especially during particularly warm or particularly cold weather. Unfortunately, generators do not have the ability to monitor an individual consumer's usage on a real-time basis. As a result, electricity consumers generally pay a set price for power whenever they consume it, day or night, summer or winter. Because consumers do not receive

the proper price signals and do not have a financial incentive, they do not reduce demand when the cost of producing electricity is high. This puts serious strain on the electricity system. Restructured markets have moved toward dealing with this problem by installing "smart grid" sophisticated meters, as well as other equipment that allows for "peak load" pricing to reduce the strain on the system, increasing system reliability and decreasing costs.

By allowing for innovation and giving investors the proper incentives for operating behavior, restructured markets have demonstrated that restructuring can serve to reduce electricity costs for all consumers. Yet the restructuring of markets has limited political support, and is still haunted by the specter of the California electricity meltdown.