

A MICROECONOMIC JUSTIFICATION FOR CAPACITY MARKETS

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Overview

The past few years have seen numerous electric markets in the United States adopt some form of centralized capacity market. PJM and ISO-NE have recently both received FERC approval for multi-year forward centralized capacity markets and are beginning implementation. California is currently considering the adoption of such a mechanism. Other markets, Texas and MISO, are using an “energy only” construct for resource adequacy. Proponents of this market structure often point to “economic efficiency” of markets and that regulatory inference in that market from the construction of a capacity market is not economically efficient. This paper demonstrates that, given the structure of the electricity market, centralized capacity markets are actually a more economically efficient market structure. This result arises because electricity markets do not fit the classic competitive market structure. Differences include the network nature of the electricity marketplace which leads to free-rider problems, political realities that lead to market intrusions such as bid caps, and the lumpiness of production resources compared to the sizes of many consumers. The paper examines these issues and concludes that a market structure with a centralized capacity market will lead to more economically efficient outcomes.

Methods

The paper examines the electricity market from a Microeconomic point of view. The first focus is on the incentives of the various market participants, and, how, given the network nature of electricity, the assumptions that individual market participants will correctly choose the right level of reserves to avoid high energy prices is not what is incentivized. Second, electricity markets do not exist in a pure competitive world, but because electricity is considered a necessity and historically these markets were regulated, there will be some form of regulatory oversight. Experience has shown that this may interfere with the unfettered competition because of the politician reality that regulators or legislators may not allow the market to fully function; there may be an incentive for regulators to allow the lower prices when there is an oversupply, but not allow prices to rise when shortages arise. Third, some aspects of the electricity and capacity product, such as the sometimes very large size of a marginal capacity resource, will effect how the market behaves.

Results

The result of the careful microeconomic examination of the electric and capacity markets is that it does not fit into the classic, competitive market model. This does not mean that competition in electricity markets isn't good, only that the structure needs to be modified to accommodate the externalities in the market. The best way to achieve this is by creating a central capacity market, similar to that in PJM or ISO-NE, and proposed by the California Forward Capacity Market Advocates (CFCMA) for California. How such a mechanism leads to the most efficient outcome can be seen by again looking to the Microeconomic underpinnings of the market. This microeconomic analysis of the incentives of the market participants and economic efficiency of the market structures is applied to the CFCMA proposal to demonstrate how this will lead to a result superior to an energy only market structure.

Conclusions

When considered from a Microeconomic perspective, the most efficient market structure for electricity includes a central capacity market, similar to that proposed in California by the CFCMA.