ABSTRACT

"Market Power and Incentive-based Capacity Payment Mechanisms"

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Capacity payments reward generators for being available to produce electricity. Many existing capacity markets suffer from weak incentives for plants to supply during the high-demand hours when they are most required. As a result, several jurisdictions are considering an alternative system based on reliability options. These options provide a fixed payment to generators. In exchange, generators face a market incentive to produce during periods of system scarcity when wholesale prices are high. We show severe shortcomings of the reliability option mechanism. By adjusting their price and quantity bids, generators with market power can choose whether a scarcity condition exists. For some firms, it may be profitable to withhold output and create a scarcity condition. We illustrate this problem using hourly data from the first ten years of reliability options in the Colombian wholesale market. We show that the options do not minimize the cost of meeting demand and create perverse incentives for generators that could reduce the reliability of electricity supply. As an alternative, we propose an energy-contracting approach to long-term resource adequacy. Counterfactual simulations with this contracting mechanism show more efficient water use and lower risk of supply shortfalls relative to the reliability option mechanism.