

Generation Capacity Adequacy in Interdependent Electricity Markets

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Abstract

This paper deals with the practical problems related to long-term security of supply in regional electricity markets with transmission constraints. Differences between regulatory policies and market designs in terms of generation adequacy policies may distort the normal functioning of the neighboring markets, as well as the reliability of supply. We test the effect of heterogeneous regulatory design between two interdependent markets: energy-only market, price-capped market without capacity mechanisms, price-capped markets with forward capacity contracts obligation. We rely on a long-term market simulation model in system dynamics that characterizes expansion decision in a competitive regime. The results show that differences in market designs affect both price and reliability of supply in the two markets. We examine both the short and long terms effect, and how free-riding may occur where capacity adequacy policies are adopted in one market but not the other. The main finding is that the lack of harmonization between local markets in policies to ensure capacity adequacy may lead to undesirable side effects.

Keywords: Electricity markets, reliability, capacity adequacy, interconnection