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Modeling generation expansion in the context of a security of supply mechanism based on long-term auctions. Application to the Colombian case

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Abstract-

In an attempt to provide electricity generation investors with appropriate economic incentives so as to maintain quality of supply at socially optimal levels, a growing number of electricity market regulators have opted for implementing a security of supply mechanism based on long-term auctions. In this context, the ability to analyze long-term investment dynamics is a key issue not only for market agents, but also for regulators. This paper describes a model developed to serve this purpose. A general system-dynamics-inspired methodology has been designed to be able to simulate these long-term auction mechanisms in the formats presently in place. A full-scale simulation based on the Colombian system was conducted to illustrate model capabilities.

Index Terms- Security ofsupply; Long-term auctions; Electricity marketmodeling

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