

A new model to simulate local market power in a multi-area electricity market: application to the European case

A. Orgaz Gil; A. Bello Morales; J. Reneses Guillén

Abstract-

The work presented in this article proposes an original method that models the medium-term market equilibrium under imperfect competition circumstances in multi-area electricity systems. It provides a system analysis considering multiple market splitting possibilities, where local market power may appear according to the status of the interconnections. As a result of new policies and regulations, power systems are increasingly integrating the existing electricity markets in unified frameworks. The integration of electricity markets poses highly challenging tasks due to the uncertainty that comes from the agents' strategic behaviors which depend on multiple factors, for instance, the state of the interconnections. When it comes to modeling these effects, the purpose is to identify each strategy by using conjectured-price responses that depend on the different states of the system. Consequently, the problem becomes highly combinatorial, which heightens its size as well as its complexity. Therefore, the purpose of this work's methodology is the reduction of the possible network configurations so as to ensure a computational tractability in the problem. In order to validate this methodology, it has been put to the test in a realistic and full-scale two-year operation planning model of the European electricity market that consists of a group of nine countries.

Index Terms- conjectural variations; European internal electricity market; market equilibrium; multi-area system; optimization models

Due to copyright restriction we cannot distribute this content on the web. However, clicking on the next link, authors will be able to distribute to you the full version of the paper:

[Request full paper to the authors](#)

If your institution has an electronic subscription to *Energies*, you can download the paper from the journal website:

[Access to the Journal website](#)

Citation:

Orgaz, A.; Bello, A.; Reneses, J. "A new model to simulate local market power in a multi-area electricity market: application to the European case", Energies, vol.12, no.11, pp.2068-1-2068-15, June, 2019.