INTEGRATION OF SOUTH-WEST SPOT ELECTRICITY MARKETS: AN UPDATE

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Overview

This paper aims to assess the level of integration of the South West Europe (SWE) regional electricity spot markets (REMs) created under the initiative launched by the European Regulators Group for Electricity and Gas (ERGEG) (Karova, 2011; Meeus & Belmans, 2008) and essential to comply with the targets set in the Florence Regulatory Forum (Europex, 2009). Due to geographical conditions, the integration of the European South-West regional electricity spot market relies on the physical interconnection between two pairs of Transmission Systems: Portugal-Spain and Spain-France. Development of the interconnection capacity between Portugal and Spain has been pursued, while between France and Spain the existing interconnection capacity is considered to be a critical factor to ensure integration (Everis & Mercados EMI, 2010). In a related study, by Amundsen & Bergman (2007) differences in Nordpool spot electricity prices were found when there is a high supply of hydropower generation, a region where integration is well established. This was further analysed in the MIBEL coupled electricity markets expanding the knowledge of Market Splitting issues.

Methods

Electricity spot market integration was evaluated by correlating day-ahead hourly spot electricity prices (from 1st of January 2009 to the 31st December 2011) in each pair of spot markets (Portugal-Spain, France-Spain, Portugal-France).
An empirical detail analysis to the existing Price Coupling mechanism existent between Portugal and Spain (the Iberian Electricity Market – MIBEL) was made, taking into consideration Market Splitting, Available Transmission Capacity (ATC) congestion and volumes of renewable generation.

Results

The current electricity market integration between Portugal and Spain was found to be high. France and Spain were found to have poor electricity market integration, which justifies the European Union to support the investment in the development of new interconnections.
Interconnectors also offer the advantage of increasing opportunities for renewable generation operation (together with supply security). It was found however that an excess volume of renewable generation (including hydropower), which is normally bid at low prices, creates interconnection congestion leading to potential inefficiencies in renewable operation and Market Splitting.

Conclusions

A strong correlation was found between both Portuguese and Spanish system marginal prices, that is to say MIBEL markets, leading to the conclusion that the Price Coupling mechanism is efficient and contributes to the integration of spot electricity markets. However this mechanism is absent between MIBEL and EPEX and as demonstrated by the low correlation found, there is a weak integration level between these spot electricity markets.
The need for adequate interconnector capacity is essential not only due to supply security and the intermittent nature of renewable generation, but also due to increase in renewable operation efficiency and correct Market Coupling. With the increasing renewable generation capacity, the design of the transmission capacity is of the foremost importance taking into account the existing and forecasted renewable generation in each Regional Electricity Market.

References

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