Optimal strategy for renewable participation in electricity markets
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Abstract
Isotrol is developing advanced ICT solutions for renewable energy traders and investors, that facilitate the effective participation of renewable energy in wholesale Spanish electricity markets. The main objectives pursued are:

- Renewables participation in electricity markets: monitoring and analysis
- Participation strategy optimization based in the combined analysis of wholesale electricity markets: daily, intraday, secondary, tertiary, etc.
- Supporting effective participation of renewable in secondary reserve market

These solutions are supported by advanced technologies and techniques, such as Big Data and Machine Learning algorithms where rely the innovation of the solutions.

It is intended to take advantage of Spain’s leadership in renewable technologies, a market with a regulation that allows them to effectively participate in the balancing markets, which is the European leadership in this matter and that will undoubtedly mark the trend world.

Isotrol is an engineering and consulting company with a strong specialization on services and solutions for renewable energy installations, with over 33 years’ experience. With headquarters in Seville (Spain) has commercial and technical offices in UK, USA and Brazil. Isotrol provides products and services for monitoring and control, deployment and integration in renewable energy facilities, at three levels: local generation installation (wind, Photo Voltic, biomass, ...), control center and 24x7 helpdesk services. For more information visit www.isotrol.com.

Methods
The innovative techniques tested as Big Data and Machine Learning, support the development and operation of these tools, enabling the possibility of obtaining high performance tools taking advantage of the big amount of information available, including high accurate results for monitoring and control and predictive analytics

- Optimizing the mechanisms for the energy production prediction (energy and instantaneous power for the most exigent and restrictive markets) based on statistical methods and including predictive management of unavailability.
- Algorithms and tools for the analysis of wholesale markets and short-term price prediction, prediction of market dynamics, demand deviation, etc.

Results
The main result offered consists of a monitoring and control system including a set of algorithms and machine learning tools specifically designed to support the participation of renewable energies in the wholesale electricity market as well as the efficiency in generation, supporting the decision making process and the results and strategy analysis: incomes, revenues, offers success, etc.

Conclusions
As Wind industry reaches more market share in the energy mix, the energy prices in markets are downwards. Participating in different energy markets as balancing and ancillary services can provide additional revenues.

There is a need of these tools that predict different market dynamics and provide a multimarket strategy for wind facilities, suggesting what energy to sell in each of the markets, as there is a large number of possibilities for each one of them. The new XBID Cross-Border Intraday Market Project will be critical for the wind industry in order to maximize incomes.

These algorithms are a set of tools oriented to increase the technical and economic efficiency of wind installations.

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