

# **Battery energy storage integration in wind farms: economic viability in the Spanish market**

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## **Abstract-**

**This paper proposes an economic assessment tool that determines the viability of a&nbsp;renewable power plants&nbsp;for different market applications such as day-ahead price arbitrage, participation in the balancing market and schedule tracking by reducing wind deviations. In particular, maximum BESS investment prices are derived to make BESS potentially viable for each functionality. A case study of an actual 30 MW wind farm participating in the Spanish electricity market is used to test the economic viability of different sizes of Li-ion and vanadium-redox BESS. Results show that with the actual structure and level prices in Spain, the participation in the balancing market could achieve positive&nbsp;**

**Index Terms- Battery energy storage systems; Flexibility; Renewable integration**

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