

This paper proposes an appropriate offering strategy method for an electric railway company (ERC) to participate in reserve markets. In this respect, first the problem of energy and reserve scheduling for the ERC is modeled in a deterministic way. Next, a robust optimization technique is used to solve the problem taking into account the uncertain energy and reserve prices as well as the uncertain hourly energy demand of the electric railway substations. Afterward, a reserve offering curve construction algorithm based on the solution of robust energy and reserve scheduling is proposed. This algorithm takes into account the correlation between upward and downward reserve prices. Finally, to show the effectiveness of the proposed method, a realistic case study based on the characteristic of an ERC in Switzerland is presented.

