

عنوان مقاله:

Stochastic Assessment of the Renewable-Based Multiple Energy System in the Presence of Thermal Energy Market and Demand Response Program

محل انتشار:

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خلاصه مقاله:

The impact of different energy storages on power systems has become more important due to the development of energy storage technologies. This paper optimizes the stochastic scheduling of a wind-based multiple energy system (MES) and evaluates the operation of the proposed system in combination with electrical and thermal demand-response programs and the three-mode CAES (TM-CAES) unit. The proposed wind-integrated MES consists of a TM-CAES unit, electrical boiler unit, and thermal storage system which can exchange thermal energy with the local thermal network and exchange electricity with the local grid. The electrical and thermal demands as well as wind farm generation are modeled as a scenario-based stochastic problem using the Monte Carlo simulation method. Afterwards, the computational burden is reduced by applying a proper scenario-reduction algorithm to initial scenarios. Finally, the proposed methodology is implemented to a case study to evaluate the effectiveness and appropriateness of the proposed method.

کلمات کلیدی:

Three mode compressed air energy storage (TM-CAES), thermal energy market, Stochastic programming, wind generation, demand response program

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