

Real time dispatching and trading strategy of electric vehicles participating in power market

The rapid growth of electric vehicles (EVs) is an unstoppable development trend worldwide. Governments all over the world are increasing their policy and financial support for electric vehicles. The replacement of internal combustion engine vehicles by electric vehicles will be the inevitable development trend of the future automobile industry, and the penetration rate of electric vehicles will increase in the future.

China has listed electric vehicles as an important part of the national development strategy. Strong policy continuity and rapid industrial development momentum. In 2021, the cumulative sales volume of new energy vehicles in China was 2.88 million, accounting for 13.88% of the total sales volume of passenger vehicles

To strengthen the interaction with users, the design of electric vehicle charging guidance scheme by using deep learning is studied. Considering the randomness of EVs integration, the uncertainty of renewable generation and load, a real-time scheduling model with goals of minimum power fluctuations and minimum charging and discharging cost is established using a model-free deep reinforcement learning method. In order to satisfy the user's demand, a charging and discharging boundary model is used to characterize the charging and discharging characteristics of EVs. After day-ahead training and parameters preservation of the proposed model, the corresponding charging and discharging scheduling strategy is generated in real time for the intraday real-time states of the system operation.