Research on Electric Vehicle Mutual Selling Mechanism Based on Block Chain System

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Introduction

The general trend of global energy consumption is to shift to low-carbon, clean, efficient, and electrification. Aiming at the characteristic that electric vehicles can be used as a distributed power source, we study the mutual sales mechanism of electric vehicles to realize the sales of electricity based on blockchain technology with the participation of electric power companies as the weak center.

Transaction framework

This paper proposes a new decentralized mutual trading mode for electric vehicles. The so-called decentralization means that with the help of blockchain technology, the management and recording of power trading and trading information are handed over to the participants in the power market, and no special central organization is set up to centrally manage the trading situation. The decentralized electric vehicle mutual trading system architecture can be divided into the data layer, network layer, consensus layer, smart contract layer, and application layer. The framework of electric vehicle mutual trading is shown in Figure 1.

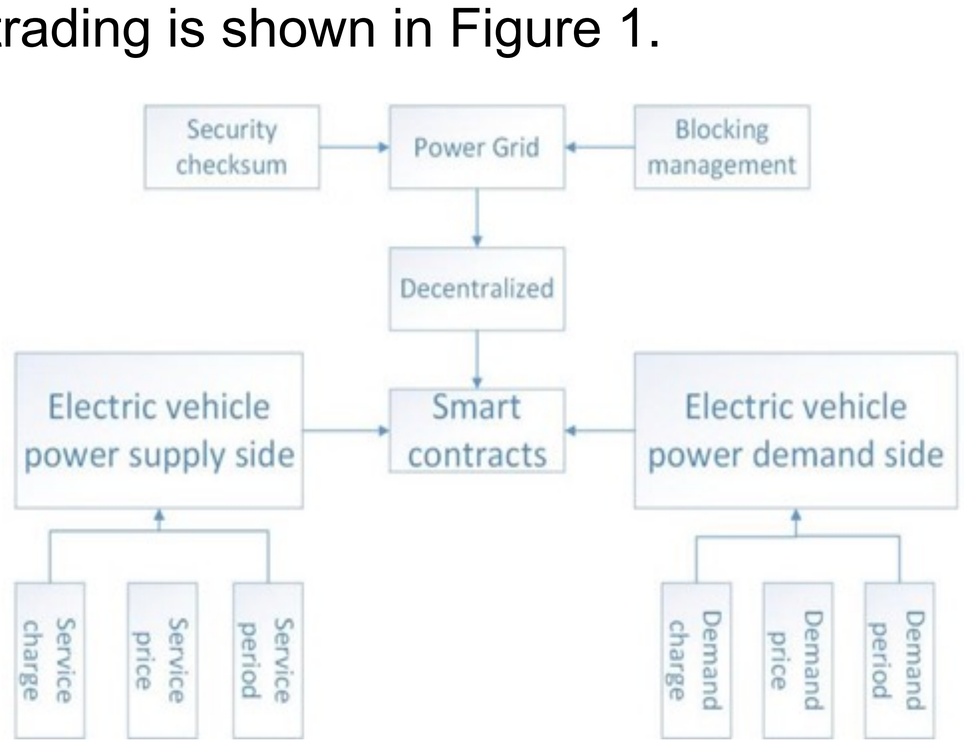

Figure 1 Transaction Framework

Results

- The charging and discharging time of electric vehicles in each time period under the real-time energy management strategy is shown in Figure 2. It can be seen from the comparison of the electric vehicle status display diagram that the electric vehicle has relatively frequent charge and discharge Alternation under the off-line algorithm. Although it enhances the enthusiasm of electric vehicles to participate in energy management and scheduling, to a certain extent, this frequent charge and discharge operation causes great damage to the electric vehicle battery and indirectly increases the operating cost.

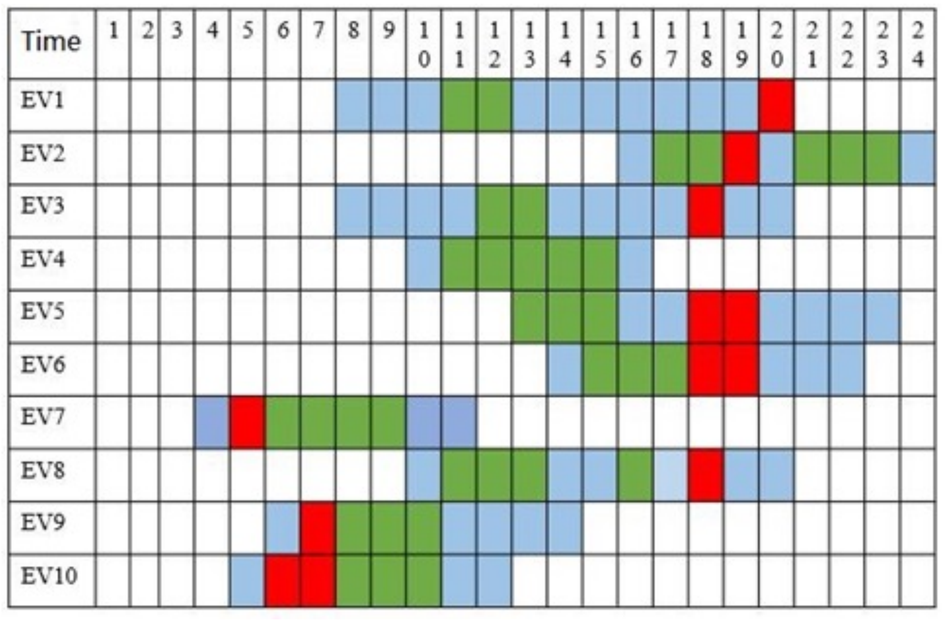

Figure 2 Electric vehicle charge and discharge distribution under global optimization algorithm

Conclusions

The new V2G model established in this paper is based on blockchain technology. It can not only guide the charging and discharging behavior of electric vehicles, but also have a variety of potential service types, such as using electric vehicles to regulate peak load and frequency, and providing corresponding energy storage services for new energy grid connections.