Seminar work

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Applied game theory

1 Problem solved

The article deals with the problem of construction of charging infrastructure and its charging in urban residential areas for electric cars. The study focuses on the feasibility and overcoming this dilemma through various subsidy incentive mechanisms and the sharing of economic benefits between the government, charging infrastructure operators, real estate agents and electric vehicle users themselves. Using evolutionary game theory, the authors create a theoretical model based on strategic interactions between various factors in supporting charging devices in urban residential areas.

2 How game theory was used

The authors used the evolutionary theory of games, where 4 main players perform. The first player is the government, which provides subsidies for electromobility and the construction of the necessary infrastructure. It also oversees companies and organizes electric car users. The government, rather than the player, acts as a market regulator by subsidizing all participants.

Other players are real estate agencies and charging infrastructure operators. In this case, real estate agents should be responsible for investing in charging stations and selecting their location where these stations will be installed. Charging infrastructure operators are responsible for the operation and management of these stations. The last player is the users of electric cars, who use the created structure of charging stations, which exists thanks to the first three players.

As already outlined, the first three players create a cooperation agreement. Thus, the government provides subsidies that are drawn by both real estate agencies and charging station operators. Real estate agencies use these subsidies for the construction of stations and charging station operators, they use subsidies to maintain services and provide them to customers. Together, they form one large entity, to which real estate agencies bring the creation of infrastructure and the operators provide recharging infrastructure