

# ***DIFFUSION FORECASTING OF ELECTRIC VEHICLES BASED ON CONSUMERS' PREFERENCES: A KOREAN CASE***

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## **Overview**

In recent years, demand for environmentally friendly vehicles has increased since the environment impact of the automobile exhaust has steadily got attention. However, demand for eco-friendly vehicles is unclear because of the lack of awareness and familiarity with internal combustion engine vehicles. Therefore, it can obtain more realistic prediction by considering consumers' perceptions of environmentally friendly vehicles rather than only considering previous sales volume trends.

This study aims to measure consumers' preferences for EVs and to predict the market diffusion. We first conducted a survey of the car choice game. Using the survey results, we identified the significant attributes in the choice of EV and estimated the utility function of EV for Korean consumers. Secondly, we predicted the market share of EVs under various scenarios about significant attributes based on the utility function of EV.

## **Methods**

Car choice game and Discrete choice model

## **Results**

First, the purchase price, charging time, range, and availability to charging stations are statistically significant attributes in the car choice game between ICEV and EV.

Second, it is estimated that the amount of willingness to pay for one minute decrease of fast charging time or one hour decrease of slow charging time is about 160,000 KRW and for the one increase of the number of charging stations within a radius of 5 km is about 830,000 KRW for Korean consumers.

Third, according to the scenarios regarding price, charge time and charging station, EV market share is predicted to be from 9.71 % under pessimistic situation to 21.87% under optimistic situation in 2027. In particular, under the most likely scenario, EV market share of Korean automobile market is predicted to be 16.82% in 2027.

## **Conclusions**

Through this study, we examined the trend of green vehicles' market diffusion by applying the Multinomial Logit model in order to analyze how each attribute affect the vehicle purchasing. Using the results, strategic decisions and policy bases for the market of eco-friendly vehicles can be developed. In addition, we expect the market share analysis process designed in this study is considered to contribute in forecasting the market diffusion of various new products.