

B-17 Research on strategies for wide spreading of electric vehicles as a low CO₂ emission traffic system (Final Report)

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The emission of CO₂ from transportation sector is 21% among total emission in Japan. And from automobiles, it is 16%. To decrease the emission from automobiles with keeping mobility, use of an electric vehicle (EV) is important because energy consumption rate of an EV is better than that of ICE cars. The present performance of an EV is low and price is expensive, infrastructures such as energy supply and battery recycle are not prepared yet. To solve these problems, the strategies to spread EV widely should be studied.

The results of the research are as next.

A simulation program to calculate the performance of an EV was developed. The range per charge, maximum velocity acceleration and primary energy consumption rate can be calculated with high accuracy by the program.

The required performance was obtained by hearings and running tests. The range of 150km and the load of 2 tons are enough in a light truck for the transportation in a city. From the view of energy consumption and the performance, an EV is suitable in a city short range trip.

The energy consumption rate was obtained by a calculation and a driving test. From the long driving test between Tokyo and Osaka, both the energy consumption rate and the energy price of an electric mini-car was as half as that of the same sized ICE car.

It was found that the battery control system is required to get the energy from battery as maximum.

The battery capacity meter which monitor the voltage and the internal resistance of the battery was developed and the accuracy of the meter was very fine.

The resources of batteries were calculated and the way of recycling was analyzed.

The specifications and performances of EVs which meet the purposes of practical uses of automobiles were evaluated. If new technologies will be applied in EVs, electric taxis and light trucks will become practical.

The way to spread EVs was analyzed from the view points of economics. As the personal expenses are much expensive compared with the price of the car which is used in a transportation business, if the car is designed to get higher incomes the problem of initial cost will be solved.