SUMMARY OF MASTER'S DISSERTATION

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Title

A study of

Economical Efficiency Evaluation for Electric Tractor Introduction of Ground Container Traffic

Abstract

The objective of this study is to evaluate economical efficiency when an efficiency fuel consumption EV tractor introduce.

Japanese harbor is that important subject is the measure against emission gas reduction of the vessel in a port and Harbor-loading-and-unloading machine etc from a viewpoint of global warming prevention and air pollution. In the meantime, the express company occupies the fuel consumption of about twenty percent. Also, it has begun to outsell profits because of influence of high oil prices. For these cause, it can consider environmental and economical to introduce EV tractor around most amounts of container handling Tokyo harbor.

The target of this study is the transportation business which introduced EV tractor using the DCF method is evaluated.

(1) Design of modeling of profit evaluation of EV tractor

(2) Free Cash Flow and Net Present Value evaluation of plural scenario to consider progress of future battery technology

Firstly, Comparison of the purchase of EV tractor, and the purchase of a diesel tractor. Secondly, Comparison of Purchase and lease of EV tractor. Thirdly, Comparison at a battery price in 2015. Fourthly, Comparison at a battery price in 2020. Fifthly, Comparison at a battery price in 2030. Finally, Comparison of the purchase of EV tractor, and the purchase of a diesel tractor.

The simulation results show that the purchase of the diesel tractor can make economic value more high than the purchase of EV tractor. Also, purchase of EV tractor can make economic value more high than lease. But the present price of EV tractor cannot make economic value. This reason is that the battery price is neck. The economic value can make the battery price in 2030. Thus, EV tractor cannot say that economic value can make the present battery price. But the battery price of future can make as economic value as diesel tractor of the present. Moreover, the experts review results show that they referred it is important that make how to the economic value at the battery price of present.

A future work is necessary also take into consideration progress of the battery technology in the future.

Key Word(5 words)

Tokyo harbor, Environment, EV tractor, Discounted Cash Flow, Net Present Value