

Feasibility Test on Renewable Energy and EV taxi

S. Baek

Korea Advanced Institute of Science and Technology

ABSTRACT

Korea depends heavily on oil imports. Thus, in Korea, efficient energy management is imperative. For this reason, the current Korean administration is striving to improve its energy infrastructure with the construction of stable energy supplies and reliable systems the implementation of energy policies, such as smart grids, Electric vehicles and the diffusion of renewable energy generation sources. In line with this logic, my research consists of two related parts; first one investigates the relationship between innovation of energy sustainability and paradigm change in conservative industry; second one investigates relationship between energy sustainability and environmental optimization in grid sector.

In my first research project, I examined the economic feasibility of Electric Vehicle taxi by using B/C analysis and Conditional Value Method to examine the intangible and tangible advantages of adopting Electric Vehicle as a taxi. This study not only measured the profitability of local taxi enterprise, but also measured the intangible benefits that local citizen and government could acquire through the EV taxi adoption by using conditional valuation method and survey.

In my second research project, I examined the economic, environmental, and technological feasibility of hybrid systems by simulating a system composed of renewable energy, an existing grid system, and a diesel generator on Jeju Island in Korea. This study finds that the most economically feasible hybrid system is a grid-connected wind turbine-photovoltaic-battery-converter hybrid system. Given the economic feasibility of this hybrid system, implementing it would decrease the price of electricity in Jeju. Both the implications and limitations of this study will be discussed in the last section of this paper.