Widespread Diffusion of Electric Buses in Japan : Analysis from the perspective of Transition Theory

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1. BACKGROUND AND PURPOSE OF THIS STUDY

In recent years, to improve the issues such as global warming and climate change is urgently needed, and the electrification of transit bus has been gaining attention as one of the countermeasures in the world. Whereas the adoption is the most rapid in the countries like China, U.K., and the Netherlands, there has been relatively small changes in Japan to this time and falling behind the rest of the world. Moreover, although BYD have been taking control of the electric bus market in preference to domestic companies since their entry into the market, no action has been taken by the government to protect domestic industries. By analyzing the barriers in the diffusion process of electric buses in Japan and exploring the niche-regime interaction, this study aims to reveal why such a situation has been reached in Japan.

2. RESEARCH METHODOLOGY

In this study, based on a conceptual framework for sustainability transitions taking geographical dimensions into account, the development process of the niche for electric buses and the changes in the situation surrounding niche innovation by domestic and foreign companies in Japan are discussed.

Specific research methods include the historical analysis of developmental processes based on the interaction between niche-regime interaction by literature surveys, and the analysis of barriers surrounding respective electric bus technologies by hierarchical analysis and interview surveys. Based on the results, the interpretation and explanation will be made based on the conceptual framework explained above.

3. SUMMARY AND CONCLUSION

Firstly, the extremely high total system cost of both converted electric buses and BYD electric buses compared to conventional diesel buses is the most serious barrier, and hindering the active adoption for Japanese transit bus operators. Secondly, it was found that, while those using converted electric buses still see technical and institutional factors as barriers, operators using BYD electric buses see only economic barriers as barriers, thereby choose the niche innovation by BYD electric bus with lower barriers for operators to adopt.

Besides, it was suggested that foreign niche innovations could be actively taken in without protecting local companies in the early stages of the transition, where the economic efficiency and technological level of niche innovations by domestic companies are inferior to those of overseas and also the transition to a sustainable social system is in the early stages.