

Analisis kebijakan pengembangan industri battery swapping menggunakan model sistem dinamis = Policy analysis of battery swapping industry development using system dynamics

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Abstrak

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Pemerintah Indonesia telah menargetkan pengembangan industri battery swapping sebagai salah satu upaya untuk meningkatkan adopsi motor listrik. Namun, karena sistem battery swapping merupakan sistem yang kompleks dan dinamis, diperlukan strategi untuk pengembangan industri battery swapping. White-box modeling dapat membantu mendapatkan wawasan mengenai bagaimana driving forces (kekuatan pendorong), yang terdiri dari variabel eksogen serta intervensi kebijakan, dapat berdampak pada pengembangan industri

battery swapping. Studi ini fokus pada tiga objektif yaitu tiga objektif yaitu jumlah pengguna motor listrik, jumlah pengguna battery swapping dan profit battery swapping. Terdapat tiga driving forces yang mendorong tercapainya objektif, yaitu teknologi pembuatan baterai serta kebijakan (battery pack standardization, discount on electricity price, dan government subsidy on battery swapping station building). Kebijakan ini diuji ke dalam tiga skenario berbeda. Hasil menunjukkan bahwa standardisasi kemasan baterai berdampak langsung kepada jumlah pengguna motor listrik sehingga berdampak langsung pada jumlah pengguna battery swapping. Selain itu, diskon biaya listrik memiliki peran yang signifikan untuk profit battery swapping.

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ABSTRACT

The Government of Indonesia (GOI) has targeted the development of the battery swapping industry as an attempt to increase the adoption of electric motorcycles. However, since the battery swapping system is a complex and dynamic system, a strategy is needed in order to develop a battery swapping system. System dynamics help gain an insight into how the established driving forces, consisting of exogenous variables and policy measures, affect the battery swapping industry development. This study focuses on three objectives: electric motorcycle user, battery swapping user, and battery swapping profit. There are four driving forces achieve the goal: the technology advancement and the policy measures (battery pack standardization, discount on electricity price, dan government subsidy on battery-swapping station building). The policy measures are assessed into three different scenarios. Results show that battery pack standardization directly affects the number of electric motorcycle user, hence increase the number of battery swapping user.

Furthermore, a discount on electricity prices has a significant impact on increase the battery swapping profit.