

Optimization-based analysis of biomass-based hydrogen infrastructure

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Biomass has been considered as one of the most promising alternatives of the current fossil-fuels which have political and economical vulnerability. In this study, we develop a new optimization model (MILP) which consider the practical issues in biomass supply such as land cultivating, seeding and crop harvesting, as well as a major features of typical biomass supply chain model. In particular, we include a new decision variable for dedicated-energy crops in order to answer the question: what and how much energy crop should be utilized for hydrogen supply? And we then conduct a case study of fuel cell vehicles (FCVs) in road transportation sector of future Korea. We identified the optimal configuration including biomass types, occupied lands, the number and location of facilities, and we analyzed cost distribution and main cost-driver.