OPTIMAL DESIGN FOR SUSTAINABLE MULTI-FEEDSTOCK BASED BIOETHANOL SUPPLY CHAIN: A CASE STUDY

Zarei Mohammadamin, 유 준[1,†], 이경범[2]
부경대학교; [1]Pukyong National University; [2]pukyong national university
(jayliu@pknu.ac.kr[†])

Bioenergy sources have been introduced to address challenges of conventional energy sources. Although the first-generation bioethanol production from food crops such as corn and sugarcane has been commercialized around the world, it has resulted in food versus fuel debate, as well as increasing in food prices. Therefore, second-generation biofuels which is derived from lignocellulosic biomass and third generation biofuels made from marine biomass is recognized as the future fuels. Thus, this study we address a mixed integer linear programing model for strategic planning of biofuel supply chain network, based on second and third generation and investigating the chance of export resources to abroad to reduce costs and has more benefits. This model considers resource limitation, demand constraints, and technology over a long-term planning horizon. The total objective function of this model is minimizing the total annual cost by determining feasibility and size of facilities in all aspects including upstream, midstream and downstream. An case study on Korea, confirms that the model is suitable for decision making to find the optimum method to meet the 10 percentage of biofuel demand.