Green Closed-Loop Supply Chain Network Design Considering Different Production Technologies Levels and Transportation Modes

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Abstract : Globalization of economic activity and rapid growth of information technology has resulted in shorter product lifecycles, reduced transport capacity, dynamic and changing customer behaviors, and an increased focus on supply chain design in recent years. The design of the supply chain network is one of the most important supply chain. In this paper, a two-objective mixed-integer linear programming (MILP) model is developed for designing and optimizing a closed-loop green supply chain network that, to the greatest extent possible, includes all real-world assumptions such as multi-level supply chain, the multiplicity of production technologies, and multiple modes of transportation, with the goals of minimizing the total cost of the chain (first objective) and minimizing total emissions of emissions (second objective). The ε -constraint and CPLEX Solver have been used to solve the problem as a single-objective problem and validate the problem. Finally, the sensitivity analysis is applied to study the effect of the real-world parameters' changes on the objective function. The optimal management suggestions and policies are presented.

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