

# Investigation of closed loop supply chain network design models and types of problem solving algorithms

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## **Abstract**

The task of supply chain management is to manage and coordinate the various flows within it. One of the important managerial challenges in this field is related to the coordination of the flow of materials between several organizations and within each organization. In order to achieve this, it requires the use of techniques and tools to track materials on the route from origin to destination and record information at each stage.

Energy management and optimization of re-production are increasingly becoming one of the most important issues for researchers in the field of closed loop supply chain. Reproduction of products and their return to the market, not only increases profits for the environment and customers, but also It also reduces production costs for manufacturers.

Currently, environmental pollution is the main problem on Earth, which could potentially lead to the extinction of the human species. One of the types of pollution is air pollution, which requires immediate attention. Providing an optimal network of green closed loops can play a very efficient role in the development of the industry. Therefore, the present study has examined the design methods of supply chain design to optimize re-production in order to manage energy consumption. Various methods for the design of closed - loop supply chain design have been introduced and many studies have been conducted. This study seeks to organize these methods. In this research, with a comprehensive review of research literature and supply chain performance evaluation models, different types of these models have been studied and their strengths and weaknesses have been studied. Guidelines for the use of each of these models are presented.

**Key words:** Supply chain, closed loop.