

## Green Supply Chain Network Optimization with Internet of Things

**Authors :** Sema Kayapinar, Ismail Karaoglan, Turan Paksoy, Hadi Gokcen

**Abstract :** Green Supply Chain Management is gaining growing interest among researchers and supply chain management. The concept of Green Supply Chain Management is to integrate environmental thinking into the Supply Chain Management. It is the systematic concept emphasis on environmental problems such as reduction of greenhouse gas emissions, energy efficiency, recycling end of life products, generation of solid and hazardous waste. This study is to present a green supply chain network model integrated Internet of Things applications. Internet of Things provides to get precise and accurate information of end-of-life product with sensors and systems devices. The forward direction consists of suppliers, plants, distributions centres and sales and collect centres while, the reverse flow includes the sales and collects centres, disassembled centre, recycling and disposal centre. The sales and collection centre sells the new products are transhipped from factory via distribution centre and also receive the end-of life product according their value level. We describe green logistics activities by presenting specific examples including "recycling of the returned products and "reduction of CO2 gas emissions". The different transportation choices are illustrated between echelons according to their CO2 gas emissions. This problem is formulated as a mixed integer linear programming model to solve the green supply chain problems which are emerged from the environmental awareness and responsibilities. This model is solved by using Gams package program. Numerical examples are suggested to illustrate the efficiency of the proposed model.

**Keywords :** green supply chain optimization, internet of things, greenhouse gas emission, recycling

**Conference Title :** ICIEOM 2016 : International Conference on Industrial Engineering and Operations Management

**Conference Location :** Prague, Czechia

**Conference Dates :** July 07-08, 2016