An Integrated Model for the Design and Planning of Green Supply Chains

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Abstract

The growth of waste generation has become an environmental concern. In order to prevent it, some companies are now rethinking their supply chains, making them green. In this work, we propose a model for the design and planning of green supply chains that integrate strategic and tactical decisions, within a single formulation. The model applicability is corroborated by an example, based on a published case-study.

1. Introduction

Modern society generates waste in all its activities and all consumed materials will eventually become waste. In 2000, the Europe of the Fifteen (EU-15) generated about 3.8 tonnes of waste per capita, [1]. The EU-15 has established a set of targets in order to minimize environmental impacts, which include a combination of waste prevention, material recycling, energy recovery and disposal options.

Within this framework, companies have to redesign some of their processes in order to allow European countries to meet the said targets. In particular, companies have to take a close look into their established supply chain where it is urgent to introduce the reverse flow – green supply chains. This leads to several open questions such as: where to place collection centres? How to plan the collection? How to plan production when used materials exist along with new ones? In what ways may the new flow affect the prevailing forward flow?