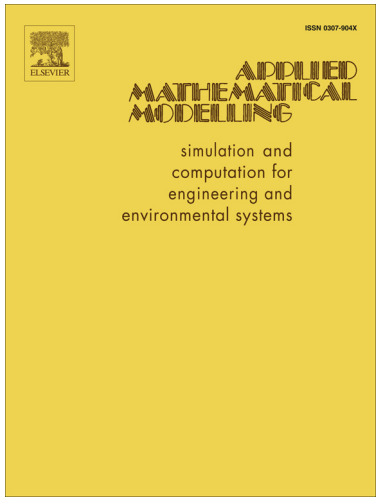

Impact of fuel price and emissions on inventory policies

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PII: S0307-904X(14)00391-6
DOI: http://dx.doi.org/10.1016/j.apm.2014.08.001
Reference: APM 10105

To appear in: *Appl. Math. Modelling*

Received Date: 9 February 2014
Revised Date: 23 July 2014
Accepted Date: 13 August 2014

Please cite this article as: A. Gurtu, M.Y. Jaber, C. Searcy, Impact of fuel price and emissions on inventory policies, *Appl. Math. Modelling* (2014), doi: http://dx.doi.org/10.1016/j.apm.2014.08.001

Impact of fuel price and emissions on inventory policies

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Abstract: The purpose of this paper is to analyze the impact of changes in fuel prices and the imposition of a carbon tax on emissions from transport on shipment lot sizes and supply chain costs. An analysis is done to show that increases in fuel prices should be dealt with differently than other costs. Further, a function to calculate future fuel prices has been developed. This function has been used to calculate transport cost in the future. The EOQ models have been modified to include increasing transport cost and emission tax to demonstrate its impact on various inventory policies. Due to increases in fuel prices, the cost of every subsequent order will also increase, thus resulting in an increase of average order cost for all the shipments in a production cycle. Organizations that have their vendors in relatively close proximity will be at an advantageous position in managing their supply chain costs more effectively in the future. On the other hand, organizations that have invested heavily in global supply chains will need to re-examine their supply chain strategy to overcome cost challenges. This research presents a new challenge for supply chains/logistics management strategies for organizations with global supply chains.

Article Classification: Research paper

Keywords: *Order cost, Global supply chain, Economic Order Quantity (EOQ), Inventory policy, Fossil fuel, Fuel price.*

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1. Introduction

There is a growing emphasis on the search for substitutes of fossil fuel that generate less pollution, are available in abundant quantities and as efficient or more efficient as fossil fuel. Nowadays, newspapers in many countries are full of news and editorials about the possible depletion of the world's fossil fuel reservoirs and the future of fuel prices. Many of the available inventory management models, such as the economic order quantity (EOQ), developed over the past century were based on the false assumptions that fossil fuel is abundant and that greenhouse gas (GHG) emissions from manufacturing and logistics operations have no implicit effects [1]. Literature on EOQ, its application under varying degrees of shelf-life, yield and its limitations