

## Planning a Supply Chain with Risk and Environmental Objectives

**Authors :** Ghanima Al-Sharrah, Haitham M. Lababidi, Yusuf I. Ali

**Abstract :** The main objective of the current work is to introduce sustainability factors in optimizing the supply chain model for process industries. The supply chain models are normally based on purely economic considerations related to costs and profits. To account for sustainability, two additional factors have been introduced; environment and risk. A supply chain for an entire petroleum organization has been considered for implementing and testing the proposed optimization models. The environmental and risk factors were introduced as indicators reflecting the anticipated impact of the optimal production scenarios on sustainability. The aggregation method used in extending the single objective function to multi-objective function is proven to be quite effective in balancing the contribution of each objective term. The results indicate that introducing sustainability factor would slightly reduce the economic benefit while improving the environmental and risk reduction performances of the process industries.

**Keywords :** environmental indicators, optimization, risk, supply chain

**Conference Title :** ICWES 2016 : International Conference on Water and Environmental Sciences

**Conference Location :** Vancouver, Canada

**Conference Dates :** August 04-05, 2016