
Guest editorial

Low-carbon supply chain management in emerging economies

Introduction

Greenhouse gas emissions resulting from human activity are increasingly causing changes in our climate, the consequences of which, such as global warming, will be predictably severe. As a result, low carbon emission has become a national development strategy in many countries. For example, some developed countries have inspired a paradigm shift in industrial and technical competition by increasing investment in the low-carbon economic field; formulating and implementing various bills, plans and strategies; and strengthening the implementation of low-carbon strategies. Developing countries, such as China, India, Brazil, Russia and South Africa, have also placed great importance on low-carbon development by issuing a series of laws and regulations to oversee the whole flow of the manufacturing, logistics, circulation and recycling of a product.

Controlling carbon emissions, a concern originally stemming from pure transportation or production systems, has now become a serious challenge in the field of supply chain management (SCM). A redesign of the whole global supply network is needed to achieve a coordinated supply chain system under the latest, increasingly restrictive regulations. As a result, many critically important research questions remain unresolved, such as how does one promote low-carbon SCM and erase sustainability barriers in developing countries. Under these circumstances, it is evident that there is an urgent need for research related to emerging economies because traditionally these nations serve as a production base for many products' global supply chains in the "non-carbon concern era".

For this special issue we received a total of 26 submissions, and, after a rigorous review and revision process, we accepted five papers for publication. In the following paragraphs, we provide a short review of each of the accepted papers, and we emphasize its major contribution.

The first paper, "Contingency theory, climate change, and low-carbon operations management", addresses the following research questions:

- RQ1. How do the perceptions of contingencies resulting from climate change at the supply chain level lead to an eventual restructuring of procedures for organizational low-carbon management?
- RQ2. How does the relationship between contingencies and change affect the managers' perceptions of benefits by adopting practices of low carbon operations management?

This paper utilized an interview-based research methodology with ten high-level managers in sustainability

and related areas from seven leading companies located in Brazil. The authors determined that an adequate low-carbon management structure is vital to improve the organizations' perceptions of the benefits from its adoption. In addition, the authors found that low-carbon management initiatives tend to emerge from an organization's existing environmental management systems, and that controlling and monitoring climate contingencies at the supply chain level should be permanent and systematic.

The second paper, "Constructing a process model for low-carbon supply chain cooperation practices based on the DEMATEL and the NK Model", developed an integrated multi criteria decision-making model for introducing and implementing relational supply chain practices for low-carbon supply chains. To validate the proposed model, the author utilized empirical data from three manufacturing organizations in China. The results provided a sequence of relational practices for guiding the organizations and their suppliers for healthy and low-carbon development. This paper also provides insights into the basic organizational steps required; the organization should first develop product development cooperation, then exchange carbon knowledge, implement effective governance and lastly build a trust relationship with its suppliers for low carbon cooperation.

"Low carbon supply chain with energy consumption constraints: case studies from China's textile industry and simple analytical model" is the third selection, which discusses low-carbon supply chain practices in China's textile industry. In this work, the authors examine how energy consumption constraints affect the optimal decisions of the supply chain members. They then address the supply chain coordination issue using two case studies from Chinese textile companies. The results suggest that textile companies must develop clean technologies to reduce carbon emissions in the production process under the energy consumption enforcement. In addition, another necessary step is to derive the optimal decisions of the supply chain members to reveal that supply chain coordination can be achieved if the manufacturer properly sets the reservation wholesale price. The production capacity may fulfill partial market demand under a wholesale price (or cost sharing) contract.

The fourth paper, "Contract and incentive mechanism in low-carbon R&D cooperation", aims to offer the producer a menu of incentive contracts to reduce carbon emissions. These incentives will apply not only in the research and development stage but also in the recycling process of the product; a two-stage closed-loop system can be realized. The results reveal that discriminating between different types of R&D researchers may hurt the producer's profit, but the updated screening contract can inspire R&D researchers to act more transparently which will be beneficial in reducing carbon emissions.

The authors of this piece thank all the authors who submitted papers for the supplementary information (SI) and the reviewers who helped review the manuscripts in a timely manner. Special thanks go to Professor Beverly Wagner, editor-in-chief of *Supply Chain Management: An International Journal*, Claire Jackson (publisher) and Amy Barson (content editor), for their constant support right from the beginning until the SI project is completed.

“On green market segmentation under subsidy regulation”, the fifth selection, analyzes the role of government subsidy policy to provide a better understanding of the market balance between regular (high-carbon) and green (low-carbon) products. This work uses a Stackelberg game framework to study the interaction between the government’s subsidy regulations and firms’ marketing regimes. This study also

explores three marketing regimes and identifies the conditions under which each regime should be adopted by a particular firm. Based on the proposed framework, regulators can gain a deeper understanding of green subsidy policies and assist focal companies in acquiring a better appreciation of green marketing segmentation.

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