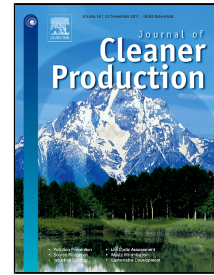


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Production decisions of new and remanufactured products: Implications for low carbon emission economy



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Production decisions of new and remanufactured products:**Implications for low carbon emission economy**Xiaofeng Wang^a, Yiting Zhu^a, Hui Sun^b, Fu Jia^c^aGlorious Sun School of Business and Management, Donghua University, Shanghai,
China^bUniversity of Sheffield Management School, UK^cSchool of Economics, Finance and Management, University of Bristol, UK**Abstract**

Carbon emission is not as free as they used to be. Under the carbon emission tax policy, manufacturers face a choice of whether to reduce their carbon emission through remanufacturing or low-carbon technologies. In this paper, we characterize the optimal carbon emission tax policy through a two-period production decision model, in which new products and remanufactured products are clearly distinguishable. The effects of a carbon emission tax on the optimal production decision of manufacturing and remanufacturing is investigated. It is found that there are rational remanufacturing production strategies for different products based on different remanufacturing cost savings and carbon emission savings per remanufactured product under a carbon emission tax policy. Manufacturers can offset the cannibalisation and negative economic impact of the carbon emission tax policy by making low-carbon emission technology investment. Furthermore, the government can stimulate the manufacturer to invest in carbon emission reduction technologies and remanufacturing simultaneously by choosing a reasonable carbon emission tax.

Keywords: remanufacturing; carbon emission tax; two-period production decision; emission reduction; low carbon emission economy

1. Introduction

A low carbon emission economy, which seeks to reduce the energy consumption, pollution, and the emissions of greenhouse gases (GHG) emitted into the atmosphere,

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