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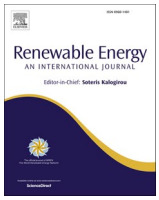

Renewable energy supply chain in Malaysia: Fostering energy management practices and ecological performance

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ABSTRACT

The trade-off between environmental issues and economic outcomes has challenged manufacturing firms to manage the renewable energy supply chain (RESC). The Malaysian manufacturing industry has been challenged for its capacity to contribute to renewable energy development and reliance on imported components. The renewable energy supply chain has risks for uncertainty, higher costs, longer lead times, and disruption. Prior studies uncover the impact of fostering energy management practices (EMPs) and ecological performance (EC) in the renewable energy supply chain under a natural resource-based view (RBV). The government has provided the incentive to drive the successful implementation of energy management to obtain clean energy and business sustainability. This study contributes to developing a theoretical model that examines the intervening effect of the RESC on EMPs and EC. This study analysed the responses of 129 manufacturing firms to understand energy management practices. The findings show that energy auditing positively relates to RESC and that government incentives have impacted energy management practices. Management commitment and energy knowledge directly affected manufacturing firms' ecological performance. The results show that manufacturing firms can best design energy management, green strategy, and competitiveness for business sustainability. Theoretical, policy and managerial implications are discussed.

1. Introduction

Managing energy consumption and operation is challenging for energy-intensive industries like electrical and electronics, pulp and paper, steel, and petrochemicals [1,2]. Energy costs have impacted the total cost of the supply chain network [3]. The extensively used energy degrades the environment [4]. As a growth driver, the manufacturing sector has substantially extended economic developments and energy consumption. Meanwhile, the manufacturing industry consumes significant energy and contributes to the carbon footprint and climate change. Manufacturers need to frequently monitor energy consumption due to tighter pollution regulations and market forces [5]. More than half of the energy efficiency potential in manufacturing firms remains untapped [6,7]. The past literature does not cover the discussion of the nexus between the renewable energy supply chain and ecological performance in the manufacturing sector. This study argues that manufacturing firms need to foster energy management practices (EMPs) and renewable energy supply chains (RESC) to improve their ecological performance.

The RESC considers the flow of renewable goods, which includes the movement of services and goods from the place of manufacturing to the end consumer. The essential factors of RESC consist of supplier, production, transport, distribution, and demand. RESC is converting raw energy into useable energy that can be regenerated (Sahebi et al., 2022).

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