

Waste-to-energy supply chain management on circular economy capability: An empirical study

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ABSTRACT

The circular economy initiative has driven the agriculture and agro-based industry to compost production waste into clean energy. However, the company ability to turn waste into energy requires well-managed energy supply chain systems. The challenges to produce clean energy through the biorefinery process in the Waste-to-Energy (WTE) supply chain led to less capable companies implementing the circular economy. This study aims to develop the theoretical-mediating of the WTE supply chain that examine the life cycle assessment (LCA), economic potential cycle (EPC) and value chain analysis (VCA) as enablers of circular economy capability (CEC). To investigate the current WTE supply chain management practices on agriculture and agro-based industry in Malaysia, this study has collected survey data from the companies that turn waste products into bio-energy and actively practices sustainable waste management. This study found that the enablers have a significant and positive impact on WTE supply chain practices and CEC. The results indicate that WTE supply chain practices have mediated the direct path from LCA and CEC. Our findings have extended the CEC's theoretical-mediating impact to explain how the agricultural and agro-based industries transform waste into clean energy. We suggest that the agro-based industry monitor the WTE practice consistently and strategically explore the opportunity to obtain benefits from clean energy while protecting the environment. Therefore, the abundant agricultural biomass waste in the developing countries should be converted into clean energy and support the business operations while also generating new income strategically.

KEYWORDS

Waste-to-energy supply chain; Circular economy capability; Agriculture and agro-based industry; Life cycle assessment; Value chain analysis; Economic potential cycle

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