

Blockchain technology adoption for carbon trading and energy efficiency: ISO manufacturing firms in Malaysia

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ABSTRACT

This study aims to investigate organisational factors of blockchain adoption for carbon trading and energy efficiency. This study develops a new theoretical model based on technology, organisation and environment (TOE), and Diffusion of Innovation (DOI) theories to fill the literature gaps. The underpinning theories are utilised to capture the motivation of manufacturing industry firms to adopt blockchain technology while supporting carbon trading activities. Using survey data, we examine the perception of early adopters of blockchain technology and their relationships to energy efficiency. The results show that attributes such as the contract system, firm size, and compatibility significantly affect energy efficiency. Paradoxically, top management support, competitive pressure, regulatory support, relative advantage, and complexity were not, as prior literature suggests, crucial drivers. Adopting blockchain technology can help a firm improve business transparency, manage energy consumption, and provide a strong business case for firms in this study.

KEYWORDS

Blockchain technology adoption; Carbon trading; Diffusion of innovation; Energy efficiency; Organisation and environment theory; Technology

ACKNOWLEDGMENTS

The authors convey their appreciation to the Indonesian Endowment Fund for Education (LPDP) and Directorate General of Higher Education, Ministry of National Education, Indonesia, for funding the World Class Professor Programme 2021 (No. 2817/E4.1/KK.04.05/2021) and Division of Research & Innovation Universiti Malaysia Pahang (PDU203220; UIC211502; RDU212701).