

**Circular Economy Practices and Operational Efficiency among Air Conditioning  
Manufacturers and Distributors in the Philippines: Basis for Strategic Green Technology**

**Margarette Ann M. Cunanan**

<https://orcid.org/0009-0002-5182-6913>

cunanan.ann08@gmail.com

University of Perpetual Help System DALTA  
Las Piñas, Manila, Philippines

**Abstract**

This study explored the relationship between circular economy practices and operational efficiency among air conditioning manufacturers and distributors in the Philippines, with the goal of developing a Strategic Green Technology Framework. Using a descriptive-correlational research design, data were gathered from 100 industry professionals representing various departments, including logistics, supply chain, and operations. Findings revealed that circular economy practices—particularly eco-design, reverse logistics, and waste reduction—were implemented at high to very high levels across firms. Similarly, operational efficiency, especially in cost control, material utilization, and supply chain performance, was also rated highly. Statistical analysis confirmed a significant positive relationship between circular economy practices and operational efficiency, with waste reduction showing the strongest correlation. Based on these findings, a Strategic Green Technology Framework was developed to guide companies in integrating sustainability principles into their operations. The framework emphasizes eco-innovation, resource optimization, circular supply chains, and digital enablement as key pillars for improving environmental performance and competitive advantage. The study underscores the critical role of sustainability in enhancing operational outcomes and provides actionable strategies for firms aiming to transition toward green, circular models.

*Keywords: Circular Economy, Operational Efficiency, Sustainability, Philippines.*