



# Academic

## INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

“TEN YEARS WORKING TOGETHER FOR A SUSTAINABLE FUTURE”

### **Cleaner production practices towards circular economy implementation at the micro-level: an empirical investigation of a home appliance manufacturer**

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#### **Abstract**

The concept of circularity has been widely discussed in the literature, but the implementation of the circular economy (CE) concept at the micro-level remains unexplored. Manufacturing companies should develop new business strategies and implement new practices in the transition process towards a circular economy model at the bottom-up. Cleaner production (CP) principles and practices have been discussed as essential for CE adoption at the micro-level, but specific studies should be conducted regarding the adoption and effects of cleaner production in promoting CE. Thus, this paper aims to explore the cleaner production principles and practices adopted by a manufacturing company located in an emerging economy in order to understand how those were valuable to foster CE implementation. A case-based research was adopted in this investigation. The CP practices introduced by the company were analyzed, their connections with the requirements to be measured when transitioning to a CE paradigm, and with CE areas at the micro-level. An inductive approach was adopted to develop some propositions regarding CP and CE interactions. The main findings revealed that CP practices for product optimization are valuable to CE implementation regarding circular product design strategies. The CP principle of input substitution is valuable to reduce input and use of natural resources as well as to increase the share of renewable and recyclable resources. Technological optimization can contribute to reducing emissions level. In addition, it could be noticed that CP practices at the production area enable CE practices implementation at the micro-level and a connection with other CE areas (i.e. waste management, consumption, and support). Moreover, the findings confirmed that all CP practices and principles implemented by the company were enablers to the CE issues implementation regarding the new business strategy. Further studies may focus on testing the propositions developed in this study in other manufacturing contexts as well as on the investigation of possible cause-effect relationship that may exist between CP and CE practices adoption.

**Keywords:** *circular economy, product-service systems, cleaner production, home appliance manufacturer.*