

Towards circular manufacturing: A framework for developing and implementing a circular transition strategy

Sayyed Shoaib-Ul-Hasan*, Farazee M.A. Asif, Amir Rashid

Department of Production Engineering, KTH Royal Institute of Technology, Brinellvägen 68,
Stockholm SE-11428, Sweden

*Corresponding author email: ssuh@kth.se, Ph: +4687906354

Primary Topic: Successful Circular Economy Transitions

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Abstract: Circular economy is an emerging paradigm where businesses must operate under new assumptions about resource use and environmental and economic impact. These include, finite natural resources, limited capacity for the atmosphere to absorb greenhouse gases, restricted land available for resource extraction and processing, limited landfill capacity to accommodate waste, and untapped economic potential in existing resources. Additionally, companies face increasingly stringent and rapidly evolving regulatory requirements. As a result, those entrenched in the linear manufacturing paradigm—characterized by a "take-make-dispose" approach—are beginning to rethink and reevaluate their operations to align with the principles of circular economy. Despite growing interest, existing literature offers little guidance for manufacturing companies on transitioning from a linear to a circular manufacturing. To address this gap, this paper employs a case study research methodology to explore how organizations can effectively develop and implement a circular transition strategy. Findings highlight that circular transition strategy is developed by mapping actions and enablers contributing to circularity across key strategic areas, such as value proposition, product design, and supply chain design. Based on the findings, a structured framework is proposed for developing and implementing circular transition strategy. The proposed framework consists of a five-step approach to facilitate the development of a circular transition strategy: 1) companies should identify and prioritize the core assumptions and principles of the circular economy that are most relevant to their businesses; 2) based on the prioritized assumptions and principles, organizations should assess and prioritize the strategic areas that are critical for their transition. This includes product design, value proposition, and supply chain design; 3) companies must evaluate their current performance in the identified strategic areas concerning circularity. This assessment provides a baseline for measuring progress and identifying gaps and opportunities; 4) organizations should then identify specific actions and enablers that will drive their circularity initiatives. This may include technological innovations, partnerships, or actions that facilitate value retention and recovery; 5) finally, companies should develop a comprehensive transition strategy that maps the selected actions and enablers to the strategic areas identified earlier. Step 3-5 are performed iteratively, allowing for ongoing adjustments and refinements in the strategy as the transition progresses. This research posits that by following this structured approach, companies can achieve an incremental transition from linear to circular manufacturing.

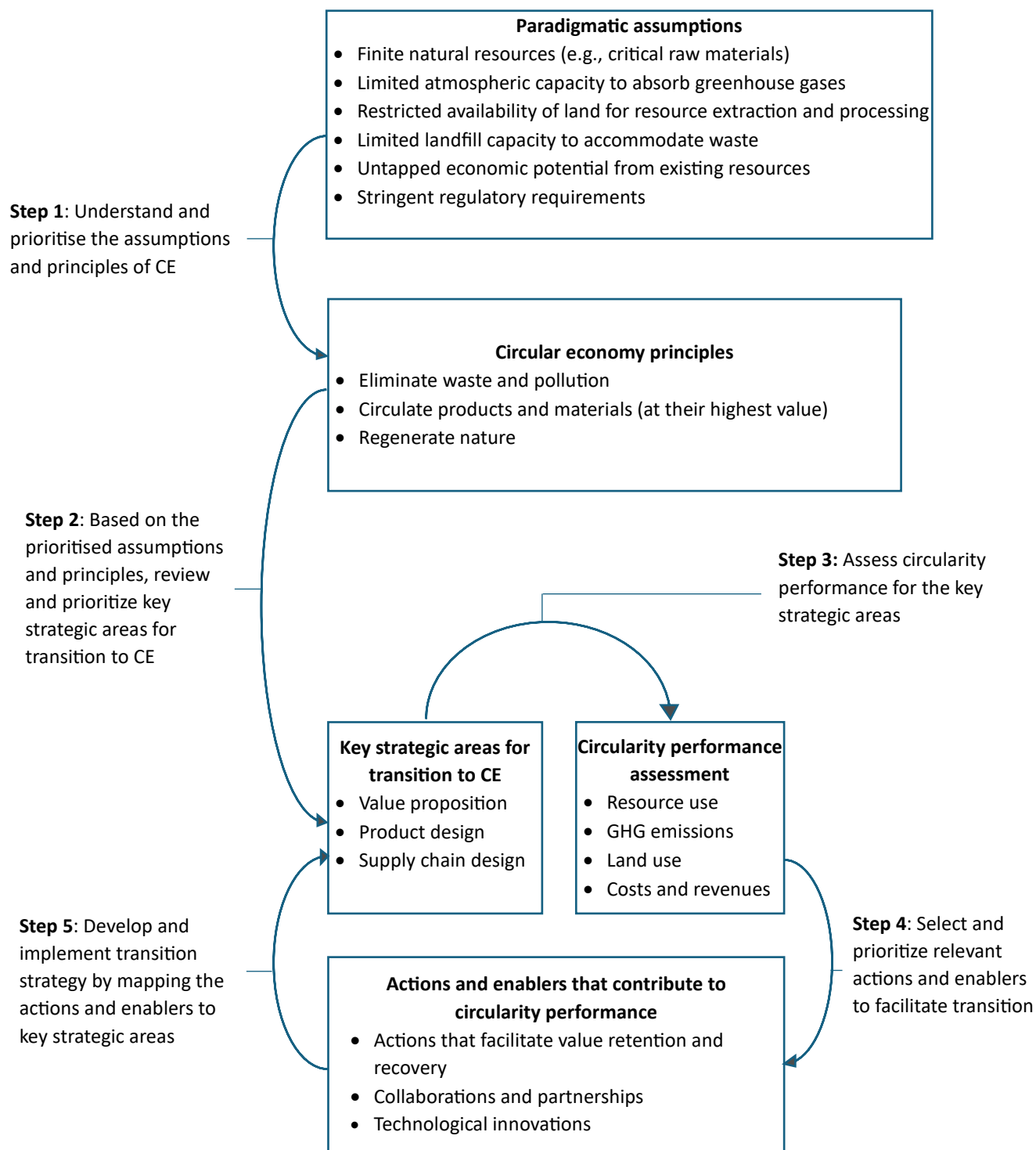


Figure 1 Framework for circular transition strategy