

Green manufacturing and logistics in automotive industry: a simulation model

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ABSTRACT

This paper investigates the concept of green logistics and manufacturing in automotive industry, in particular to manufacturing logistics and material handling involving the process of automobile assembling. This is based on actual case study of automotive assembly plant. An efficient decision making model is proposed that capture the impacts of strategic decisions on production costs and environmental sustainability. The model will assist decision makers acquire an in-depth understanding of relationship between high level planning and low level operation activities on production, environmental impacts and costs associated. The modeled problems are within the manufacturing facility of automotive assembly line and inbound logistics. The research method used is system dynamics (SD) simulation technique. The main green manufacturing and logistical issues considered are Carbon Dioxide (CO₂) emission, waste generation, water and energy utilization. The results of the SD model signify the existence of positive tradeoffs between green practices (CO₂ reduction, water and energy conservation) and operational costs.

KEYWORDS

Green Logistics; Green Manufacturing; System Dynamics Simulation; Automotive Industry; Pollution; Sludge; Water; Energy

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