

A Dynamical Approach for Relating Energy Consumption to Hybrid Inventory Level in the Supply Chain

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Abstract : Due to long lead time, work in process (WIP) inventory can manifest within the supply chain of most manufacturing system. It implies that there are lesser finished good on hand and more in the process because the work remains in the factory too long and cannot be sold to either customers. The supply chain of most manufacturing system is then considered as inefficient as it take so much time to produce the finished good. Time consumed in each operation of the supply chain has an associated energy costs. Such phenomena can be harmful for a hybrid inventory system because a lot of space to store these semi-finished goods may be needed and one is not sure about the final energy cost of producing, holding and delivering the good to customers. The principle that reduces waste of energy within the supply chain of most manufacturing firms should therefore be available to all inventory managers in pursuit of profitability. Decision making by inventory managers in this condition is a modeling process, whereby a dynamical approach is used to depict, examine, specify and even operationalize the relationship between energy consumption and hybrid inventory level. The relationship between energy consumption and inventory level is established, which indicates a poor level of control and hence a potential for energy savings.

Keywords : dynamic modelling, energy used, hybrid inventory, supply chain

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