Production-Inventory Model with Production Waste Recovery

Student：Yu-Shan Peng   Advisor：Dr. Chi-Yang Tsai

Institute of Industrial Engineering and Management
Yuan-Ze University

ABSTRACT

Owing to the recent growing environmental awareness and rising prices of raw materials, related production costs are increasing as well. If production takes into account the value of recyclable waste, unnecessary costs can be reduced. Recycling wastes generated during manufacturing processes not only carries out environmental protection, but also reduces unnecessary waste.

This study mainly focuses on the control of production and waste recycling systems. Two production-inventory systems, periodic and direct delivery systems, are constructed and analyzed. In each system, three models are considered, synchronized ordering and recycling, multiple recycling cycles, and multiple order cycles. Cost functions under the three models in the two systems are developed. Optimal order quantities, ordering and recycling cycles that minimize total costs are derived. A decision-making procedure for selecting the proper model in each system is proposed. Sensitivity analysis is conducted and the impact on the decision-making is discussed.

Keyword: Production-inventory model   Waste recovery   Inventory Management