Capacity Expansion Model with Technology Advancement under Demand Uncertainty

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Abstract

Capacity expansion is a complex process of adding new equipment of similar types to meet future demand. The accelerated pace of technological improvement and increased demand uncertainty has complicated the capacity expansion decision making recently. With rapidly changing technology, managers always have to make difficult decisions to keep their competitiveness. However, to introduce new generational equipment or product under high demand uncertainty could be risky.In this work, a capacity expansion model with technological advancement under demand uncertainty is proposed. The objective of the proposed model is to obtain the minimum cost under demand satisfaction. A linear programming model is adopted to get the timing and the quantity which of the equipment is introduced or released. The technology roadmap is considered to forecast the future technology progress, thus the time point of new equipment and products released can be obtained

Keyword：Capacity expansion, Technology advancement, Demand uncertainty, Mathematical programming