Study on solar cell industry material selection process

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Abstract

This paper proposes a material selection model for selecting suitable material for solar cells. This research applies a fuzzy Decision Making Trial and Evaluation Laboratory (DEMATEL) linguistic information method for group decision-making to gather group ideas and analyze the cause-effect relationship of complex social science problems in fuzzy environments. These ideas are divided into causal and effect groups, enabling readers to gain a better understanding of the interactive relationship among them, as well as making suggestions for improvement to enhance their overall performance. The results show that government policy is a major causal dimension and the proposed model is capable of producing effective material selection evaluation with adequate criteria that fit the respondent’s perception patterns, especially when the evaluation criteria are numerous and intertwined. We provide suggestions to help government officials devise Taiwan solar cell industry policy and companies make business strategies for future development in this industry.

Keywords: solar cell, DEMATEL, Multiple criteria decision-making (MCDM)