



“Gheorghe Asachi” Technical University of Iasi, Romania



A HYBRID MULTI-CRITERIA DECISION ANALYSIS APPROACH FOR ENVIRONMENTAL PERFORMANCE EVALUATION: AN EXAMPLE OF THE TFT-LCD MANUFACTURERS IN TAIWAN

Hung-Yi Wu^{1*}, August Tsai², Hung-Shu Wu³

¹*Department of Business Administration, National Chiayi University, No.580, Xinmin Rd., Chiayi City 60054, Taiwan, R.O.C.*

²*Department of Industrial Management, Chien Hsin University of Science and Technology, No.229, Jianxing Rd., Zhongli City, Taoyuan County 32097, Taiwan, R.O.C.*

³*Department of Smart Living Technology, Huaan University, No. 1, Huaan Rd. Shihding Township, Taipei County 22301, Taiwan, R.O.C.*

Abstract

The study developed a quantitative evaluation model of environmental performance, using a hybrid multi-criteria decision making (MCDM) approach by key environmental indicators based on the ISO14031 environmental performance evaluation (EPE) dimensions. The causal relationships and influence intensity among the EPE dimensions were explored to construct the network evaluation structure. Three well-known thin film transistor-liquid crystal display (TFT-LCD) panel manufacturers in Taiwan were used as an illustrative example. The top three key environmental indicators were found to be factory sewage discharge, Greenhouse gas (GHG) emissions, and the ratio of green product designs in reducing CO₂. The model could be further adapted to other industries.

Keywords: environmental performance, environmental performance evaluation (EPE), environmental indicator, multi-criteria decision making (MCDM), ISO14031

Received: November, 2015; Revised final: February, 2016; Accepted: April, 2016; Published in final edited form: March, 2019

* Author to whom all correspondence should be addressed: e-mail: hywu@mail.ncyu.edu.tw; whydec66@yahoo.com.tw; Phone: +88652732838; Fax: +88652732826