摘要

工業革命以來，人類大量使用化石燃料，因而使得二氧化碳排放量大幅增加，造成環境的破壞。除此之外，因化石燃料的蘊含量逐年減少，人類不得不盡快尋找合適之替代能源，所以再生能源的開發與應用，便成為世界各國關注的議題。再生能源因為取之不盡、用之不竭，更不會排放過多二氧化碳產生溫室氣體效應對環境造成影響，因此全球皆致力於綠色能源的開發與利用。但是由於再生能源的期初設置成本較化石能源高，政府需要制定相關政策補助，才能吸引大眾投入再生能源系統的建置。再生能源涵蓋許多種類，例如風力、太陽能、地熱能等，然而不同再生能源的發展條件、特性不同，政府需制定不同的推動策略及方案，特性相似的再生能源的推動策略間也應有相似的推動方案。本研究之目的即為透過資料採礦中分群的方法，利用分群方法中群組的相似特性，結合層級分析法，分別對每群找出不同再生能源類別之最適的重點行動方案推動，並以台灣的再生能源做為研究個案，其結果可以做為政府的政策規劃及決策的依據。綜言之，本研究之預期成果可歸納如下：

(1) 運用資料採礦方法建構再生能源政策之分析模式。
(2) 以台灣再生能源為例，結合層級分析法建構其最適之能源政策推動。
(3) 提供政府政策規劃之依據，以更有效之推動方式推廣再生能源之利用，使裝置容量能達到預定成長之目標。
(4) 以其他標竿國家的政策推動策略提供我國再生能源策略制定的策略，並給予現行政策推動建議。

關鍵詞：再生能源、資料採礦、分群方法、自我組織映射圖網路、層級分析法

Abstract

When a large percentage of energy (>90%) is generated by fossil fuel, carbon dioxide emissions increase the greenhouse effect. Therefore, renewable, sustainable, and economically viable energy sources are needed as alternatives to fossil fuels. The facilities and installation costs for generating renewable energy is much higher than the cost of fossil fuel facilities. Thus, governments need effective policies, regulations, and incentive programs to promote the usage of renewable energy. Renewable energy can be classified into different categories, including offshore and onshore wind power, photovoltaic solar, and geothermal. The policies used for promoting specific categories vary significantly. These policies depend on the policy goals, regulations, taxation, incentives and promotional schemes. The purpose of this study is to apply clustering techniques and AHP to analyze types of renewable energies and their attributes with respect to economic factors, energy resource and supply, and environmental effects. AHP method is used to evaluate actions that can resolve challenges found in development of renewable energy. The study provides scientific results to help the government plan renewable energy policies. The data for the case study are collected from Taiwan's renewable energy statistics related to PV cells, wind farms, ocean thermal energy, geothermal energy, hydro power, and solid waste fuels. The research will have four major results and findings.

(1) Constructing models for analyzing renewable energy policies using data mining techniques,
(2) Using seven categories of renewable energy sources, i.e., wind power, photovoltaic, geothermal and solid waste power in Taiwan, as specific renewable energy types to find the best promotional policy.

(3) Providing reliable advice to government (and the means to effectively analyze given scenarios) for policy planning and execution.

(4) Giving suggestions of the renewable policy from some benchmarking countries and providing some strategies from another countries.

Keyword: Renewable Energy, Data Mining, Clustering, Neural Networks, Self-Organizing Map, Analytic Hierarchy Process