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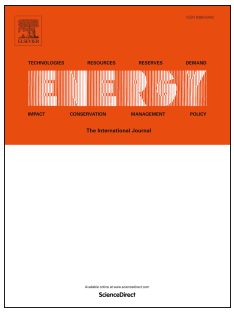

Assessment of Turkey's energy management performance via a hybrid multi-criteria decision-making methodology

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ASSESSMENT OF TURKEY'S ENERGY MANAGEMENT PERFORMANCE VIA A HYBRID MULTI-CRITERIA DECISION-MAKING METHODOLOGY

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ABSTRACT

Energy has been the major input for the national economies. While fossil-based energy resources are diminishing, researchers are focusing on alternative fuels and various technology options for conversion, distribution, and end user's operating environment processes. As the search for the alternative pathways for the "sustainable economy" idea continues, management factor is getting considerably important within each phase of energy generation and consumption.

In this paper, we employ a hybrid multi-criteria decision-making methodology to evaluate the energy management performance of selected nine countries with a focus on Turkey with respect to a number of criteria. The hybrid approach integrates three methods, viz. Analytical Hierarchy Process, Multi-Criteria Optimization and Compromise Solution, and Technique for Order Preference by Similarity to Ideal Solution. It enables decision-makersassess multiple alternatives within an analytic framework while considering multiple criteria simultaneously. We perform our analysis for each year between 2001 and 2016. The results show that, with its fast-growing population, dynamic economy, and huge energy saving potential, Turkey displays a low profile compared to the other countries in our scope. Our results can be encompassed by in-depth analyses and long-term plans to shift the country's energy technology selection strategies to more efficient, cost-effective and cleaner options.

Keywords: Energy management; Energy policy; Multi-criteria decision making; Analytic Hierarchy Process; TOPSIS; VIKOR.

1. INTRODUCTION

Energy is an essential part of daily life and issues related with energy concern many people around the world. In specific; changing global trends, rapidly rising energy consumption rates, and fluctuating high energy prices have been the main concerns for societies and stakeholders. As discussed by ***Ayres et al (2013)***, energy has a significant role in economic growth, and there is plenty of evidence that supports the view that energy will severely constrain future economic development. In industrialized countries, efficient management of energy supplies and rational use of energy and energy-related products are key requirements for economic growth. Therefore, management of energy and energy-related issues is of high interest at both strategic and operational levels for all stakeholders ***(Dincer, 2001)***.

It turns out that, the relationship between the health of a country's economy and its energy management performance is strongly related to a number of key indicators and parameters. GDP is one of the primary

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