

Chapter 6

Hybrid MCDM (Multi-Criteria Decision-Making) Approaches for Sustainable Energy Management

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ABSTRACT

Energy management judgment is regularly difficult measures comprising many information supports such as physical, social, political, technological, and financial. Energy management judgment creator regularly use a variety of processor illustrations, investigational tests, and tools to examine human fitness, the hazard associated with environmental troubles and ecological forces, and the special effects of sure solutions on risk reduction. The use of these computational models, experiments and tools is difficult for us for a reason. First, new situations arise (such as climate change, life cycle assessment, cost of living analysis, environmental risk issues and human consumption risk health). There is a lack of information to mitigate these threats. Second, decisions must be made carefully in situations where there are many normal pressures. This section discusses the hybrid MCDM (Multi Criteria Decision Making) approach to sustainable energy management.

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1.1 INTRODUCTION

Energy management issues related to rapid economic, political, technological, ecological, social and economic expansion have long been a concern for governments in countries and regions around the world; the main purpose of this section is to provide an overview of the implementation and use of decision-making processes related to energy management issues. System integration analysis technology and energy management, encompassing climate change, environmental assessment, construction, and environmental management. (Antunes, 2021). Preliminary integration employing hybrid multi-criteria decision-making and fuzzy multi-criteria decision-making.

Ultimately, environmental assessment was chosen as the initial domain to implement the decision-making process. This study's results affirm that the decision-making process aids decision-makers and stakeholders in addressing issues amid uncertainty in the decision-making context, with prior researchers frequently employing this technique across various tiers of environmental decision-making. Manufacturing procedure. Individuals endeavour to select the optimal solution when making decisions. In fact, analyzing just one measure can actually yield a good decision. In most real-world decision-making processes, it is not enough to derive a conclusion based on a single measure. Instead, multiple competing and inconsistent objectives must be evaluated.

Consequently, no singular optimal solution exists that fulfils all Decision Maker (DM) observations. MCDM assists adults in making decisions aligned with their preferences when confronted with variances (Bhatt et al., 2024) and application forms. Individuals seek to select the optimal solution when making decisions. It may be most advantageous to select only one. In most real-world decision-making processes, it is not enough to make a decision based on a single measure. Instead, many conflicting and contradictory goals must be considered. Therefore, the best solution that meets all DM requirements has not yet been developed. MCDM can help people make decisions based on their preferences when faced with conflicts (Boggia et al., 2018).

MCDM methods are good for electrical systems because they are affected by long time, uncertain location, and high capital expenditure, large number of DM and assumption fits. Various factors need to be considered when selecting MCDM techniques and methods. It is important to find a way to determine validity. Different methods may produce different results, so choose the best strategy that reflects the user's "reality". Also, the method should provide all relevant information to the DM. There must be alignment between the procedure and the accessible data. The method must also be appropriate for the owner. When DMs do not understand the inner workings of a system, they call it a black box. This will allow the DM to seek

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