

## A PREFERENCE ANALYSIS OF RENEWABLE ENERGY ALTERNATIVES IN MALAYSIA USING FUZZY VIKOR METHOD

(Analisis Keutamaan bagi Tenaga Boleh Diperbaharui di Malaysia Menggunakan  
Kaedah VIKOR Kabur)

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### ABSTRACT

In Malaysia, the main consumed energy is the fossil fuel. As the population continues to increase and the fossil fuels begin to deplete rapidly, it may not be possible to depend solely on fossil fuel. A feasible alternative should be sought to replace the dependency of the fossil fuel. In this paper, an evaluation is made on the experts' preference of the type of eco-friendly renewable energy that is suitable to be used in Malaysia between biomass, solar, hydro or hybrid energy using the fuzzy VIKOR method. Since the evaluation considers subjective element that involves human perceptions and knowledge experts, the Fuzzy VIKOR method is considered to be an appropriate choice. The Fuzzy VIKOR method has the ability to deal with multi-conflicting or non-commensurable criteria in the ranking and selecting the alternatives. The evaluation is based on four main criteria which are Efficiency, Operation, Land Use and Job Creation of each alternative. It is found that the main concern of the renewable energy choice is on its efficiency and the hydro energy is the most preferred alternative energy to be used in Malaysia.

*Keywords:* fossil fuel; renewable energy; fuzzy VIKOR

### ABSTRAK

Di Malaysia, sumber utama tenaga yang diguna pakai adalah bahan api fosil. Apabila populasi terus berkembang dan bahan api fosil mula berkurangan dengan cepat, adalah tidak mungkin untuk hanya bergantung kepada bahan api fosil. Satu alternatif yang boleh digunakan harus dicari bagi menggantikan pergantungan bahan bakar fosil. Dalam makalah ini, penilaian dibuat oleh pakar mengenai keutamaan jenis tenaga boleh diperbaharui yang mesra alam yang sesuai digunakan di Malaysia, iaitu di antara tenaga biomas, solar, hidro atau tenaga hibrid menggunakan kaedah VIKOR kabur. Oleh kerana penilaian melibatkan unsur subjektif yang merangkumi persepsi manusia dan pakar pengetahuan, kaedah VIKOR kabur merupakan pilihan yang sesuai. Kaedah VIKOR kabur mempunyai keupayaan untuk menangani kriterium berbilang bertentangan atau tidak sepadan dalam pangkat dan pemilihan alternatif. Penilaian adalah berdasarkan empat kriterium utama, iaitu Kecekapan, Operasi, Penggunaan Tanah dan Penciptaan Pekerjaan bagi setiap alternatif. Didapati bahawa kriterium utama dalam pemilihan tenaga boleh diperbaharui adalah pada kecekapannya dan tenaga hidro merupakan pilihan tenaga boleh diperbaharui untuk digunakan di Malaysia.

*Kata kunci:* bahan api fosil; tenaga diperbaharui; VIKOR kabur

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