

Accepted Manuscript

Decision making model development in increasing wind farm energy efficiency

Lutfu Sagbansua, PhD, Figen Balo

PII: S0960-1481(17)30238-0

DOI: [10.1016/j.renene.2017.03.045](https://doi.org/10.1016/j.renene.2017.03.045)

Reference: RENE 8638

To appear in: *Renewable Energy*

Received Date: 25 May 2016

Revised Date: 3 February 2017

Accepted Date: 14 March 2017

Please cite this article as: Sagbansua L, Balo F, Decision making model development in increasing wind farm energy efficiency, *Renewable Energy* (2017), doi: 10.1016/j.renene.2017.03.045.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



1 **DECISION MAKING MODEL DEVELOPMENT in INCREASING WIND**

2 **FARM ENERGY EFFICIENCY**

3 Lutfu Sagbansua ^{1,1}, Figen Balo ²

4 ^{1,1} Industrial Engineer, PhD

5 E-mail: lutsua@gmail.com

6 ² Department of Industrial Engineering, Firat University, Turkey

7 E-mail: figenbalo@gmail.com

8 Tel: +90 0424 2370000/5646; Fax: +90 424 2370000

11 **Abstract**

12 Renewable energy is a significant input for environmental, economic and social development.
13 The wind energy has become the quickest thriving renewable energy resource. It is worth noting
14 that wind power has the least emissions and lowest water consumption, but it has comparatively
15 high costs. Thus, making wind energy station planning decision requires an operation of
16 balancing various technical, economic, ecological, and environmental aspects over time and
17 space. This paper is constructed to choose a convenient turbine from various perspectives for
18 developing a wind energy station. For 2 MW, the best wind turbine brands are listed based on
19 expert interviews and literature review and they are used to establish a decision-making model
20 with four main criteria consisting technical, economic, environmental, and customer attributes
21 with various sub-criteria. Determining the related criteria and grouping them in main categories is
22 the novel approach provided by this research. The constructed model can be solved by various
23 multi-criteria decision making techniques. The selection of the best wind turbine is determined by
24 using AHP technique. The results are significant both from engineering and economic
25 perspective as the applied methodology is practically implementable and commercially viable.
26 Accurate and up-to-date data are obtained from leading companies in the industry.

27
28 **Keywords:** AHP, Wind turbine select, Renewable energy, Energy efficiency, Multi-criteria
29 decision making.

30
31
32

Abreviations used: AHP, Analytic Hierarchy Process; TOPSIS, Technique for Order Preference by Similarity to Ideal Solution.

¹ Corresponding author. E-mail: figenbalo@gmail.com
Tel: +90 0424 2370000/5646; Fax: +90 424 2370000

Download English Version:

<https://daneshyari.com/en/article/4926660>

Download Persian Version:

<https://daneshyari.com/article/4926660>

[Daneshyari.com](https://daneshyari.com)