Performance of vertical axis Savonius wind turbines related number of fins on blade

Ridwan[1], Iwan Setyawan[1], Setiyono [2]

[1]Department of Mechanical Engineering, Faculty of Industrial Engineering, Gunadarma University, Indonesia
[2]Department of Electrical Engineering, Faculty of Industrial Engineering, Gunadarma University, Indonesia

Email: ridwan@staff.gunadarma.ac.id

Model and the number of blades on the wind turbine greatly affect its performance. The purpose of this research is to know the effect of fin on Savonius turbine U type 4 number blade. A Simulation using Solidworks (Flow Simulation) software based on Finite Element Analysis (FEA) Method, will show pressure distribution and velocity distribution of blade rotor savonius wind turbines. The simulations to compare variation of addition of 1 fin, 2 fin, and blade without fin (standard). The wind speed variations applied to each of the blades is 5 m/s, and 7 m/s respectively. The simulation results showed that the performance of pressure distribution and velocity distribution on each blade is higher and more widespread and evenly distributed, occurring on each blade with the addition of two fins compared to a single fin turbine and standard blade (without the addition of fin). The higher wind speed applied to the turbine blades will have a significant effect on the value of pressure distribution and velocity distribution on the blade. The effectiveness of pressure distributions and velocity distributions that occurs on the turbine blades will be significant to effect for the rotation on the turbine shaft, so as to have a significant impact on the performance the turbines.

Keywords: blade, fin, savonius rotor, turbines.

ICDEMM 2018 (International Conference on Design, Energy, Materials and Manufacture) , October 24-25, 2018 in Bali, Indonesia.