



036-PEP

Home-Scale Vertical-Axis Wind Turbine for Electricity Generation

Ahmad EL Banhawy, Mohamed Hassan, Mohamed Khalil, Ibrahim EL Sayed, Mohamed Saber, Mahmoud Saber, Mohamed EL Sayed, Abdo Eldondaity, Mahmoud Fouad

Faculty of Engineering, Zagazig University, Zagazig 44519, Egypt, mm46222386@gmail.com, ibrahimelsayed2017@yahoo.com, eng_mohamed944@yahoo.com, engabosaber2014@gmail.com, good man good197@gmail.com, F_lampard89@yahoo.com, Banhawy.ahmad22@gmail.com, abdo1430.a1@gmail.com, M.fouad07@yahoo.com

Supervisors: Prof. Dr. Ahmed Farouk AbdelGawad¹, Dr. Mahmoud M. Abdel daiem², Eng. Ahmed G. H. Shaltut¹

¹ Mechanical Power Engineering Department, Faculty of Engineering, Zagazig University, Zagazig 44519, Egypt, afaroukgb@gmail.com

² Assistant Professor, Environmental Engineering Department, Faculty of Engineering, Zagazig University, Zagazig 44519, Egypt, engdaim@hotmail.com

Recently, there is a serious problem in energy supply because of the increasing demand, the lack of fossil fuels, and the scarcity of new petroleum discoveries. All these factors lead to the insane increase of power costs. Thus, it is vital to expand in the fields of renewable energy resources, especially, wind energy. Based on the report of the Egyptian Ministry of Environment [1], it is expected to reduce the use of fossil fuel and nature gases from 94% (2007/2008) to 40% (2021/2022) and increase the use of renewable energy from wind power from 1% to 9% for the same period. Thus, wind energy is a strong alternative resource of energy because it is clean, cheap, and suitable to remote areas. Moreover, utilizing wind energy helps in reducing pollution and global warming. The objective of the present work is to generate 200 to 300 Watts by a small-scale vertical-axis (VAWT) wind turbine. The height of the turbine is 1.0 m with five blades. The turbine can be placed on building roofs. Thus, the present research aims to design, fabricate, and implement a sustainable, easy-make, and low-cost turbine that produces a relatively good amount of power.