

## **Two blade vertical axis wind turbine: Investigations on the torque generation at different rotational velocities**

*Kalakanda Alfred Sunny<sup>a</sup>; Pradeep Kumar<sup>a</sup>; Nallapaneni Manoj Kumar<sup>b</sup>; A.Veena<sup>a</sup>; Adheena G. J.<sup>a</sup>*

<sup>a</sup> Department of Aerospace Engineering, Karunya Institute of Technology and Sciences, Coimbatore-641114, Tamil Nadu, India.

<sup>b</sup> Faculty of Mechanical Engineering, Universiti Malaysia Pahang, 26600 Pekan, Pahang, Malaysia.

### **ABSTRACT**

Among renewable energy technologies after solar energy, wind turbines are widely used. The most common types of wind turbines are Vertical Axis Wind Turbine (VAWT) and Horizontal Axis Wind Turbines (HAWT). VAWT's have the higher output energy potentials than to the commonly used HAWT's. In this paper, a study has been considered to develop the two blade VAWT and estimate the torque generation possibility in it. This study includes the selection of airfoil by comparing lift and drag generated by airfoils NACA 0012, NACA 0015, NACA 0018, and NACA 0021. CFD analysis of various rotation angles and speeds of the 2-blade Vertical Wind Axis Turbine having chord 0.5m and radius 1.25m were performed. Forces generated by the turbine over one complete cycle were estimated.

### **KEYWORDS:**

Airfoils; Computational fluid dynamics; Manufacture; Solar energy; Turbomachine blades