Perforated Blade Vertical Axis Wind Turbine for Enhanced Performance (OLP-2218)

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Abstract

Wind energy is nature's gift to all living beings. Wind energy unlike solar energy is abundantly available across the earth and throughout the day. An innovative and efficient solution can help to harness wind energy effectively. The research work proposed in this project will attempt to develop Vertical Axis Wind Turbine (VAWT) having perforated blades. A cut-out wind speed is defined for VAWTs to protect them from structural damage. The peak power is produced by VAWTs in the wind speed range between rated wind speed and cut-out wind speed. The research work proposed attempts to increase the cut-out wind speed of VAWTs by utilization of perforated blades. The objective of the proposed project is to develop a novel 100 W perforated blade VAWT capable of giving power output at high wind speeds. The proposed study consists of numerical investigation in a Computational Fluid Dynamics (CFD) environment and the development of a prototype of the proposed VAWT.

Objective: To develop a 100 W capacity perforated blade VAWT capable of being operational at high wind speeds (higher than the current cut-out wind speeds of VAWTs)