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Study on the Mechanics of a Wind Turbine to Produce Efficient Wind Energy JAIHONG OH, Lakewood Forrest, RICHARD KYUNG, Choice Research Group — Blades and turbines, rotating with high angular velocity to create centrifugal force, are the sources of a windmill's power generating force. The shape of blades influences the amount of generated centrifugal force. Therefore, in considering wind power generation, this research studies physics and fluid mechanics of blade to enhance the windmill's efficiency and accuracy. In studying the ideal flow through an actuator disc, momentum theory, tangential velocity, and accelerations are considered. In the simulations for the several NACA types of blades, comparisons of the ratio of lift coefficient to drag coefficient were found. Reynolds numbers, densities, and Mach numbers of the air were considered finding relationship between drag coefficient and lift coefficient. Incorporating these records, this research proposes ideal wind blades using computational software to simulate the angle of attack and other variables of the wind.

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