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| **Title:** | Development and Performance Analysis of Darrieus and Savonius Turbines Using QBlade | | |
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| **Abstract:** |  |
| In this research a vertical-axis wind turbine (VAWT-Darrieus type) is designed and optimized using QBlade software based on three design parameters. Three types of airfoils have been chosen to find out the suitable design to make three-bladed Darrieus type VAWT. A Savonius type VAWT was developed practically to characterize the developed generator coupling arrangement. This Darrieus type was simulated and optimized using Qblade. A practical test was done to compare the electrical and mechanical power, thrust of both turbines using a wind tunnel. After simulation, it was found that the Darrieus type VAWT with 1 meter height, 0.75-meter radius and 0.075-meter chord length with 75o circular angle made by “DU 06-W-200” airfoil has better coefficient of performance. On the other hand, the Savonius type VAWT having 0.37 meter and a radius of 0.11 meter showed 0.0006 Watt electrical power and 5.8844 Watt mechanical power at 4 m/s. Savonius type wind turbine with 0.37 meter height and 0.11 meter radius is applicable for low speed whereas larger 1 meter Darrieus type could be the proper choice. | |