

Evaluation of an Air Energy Recovery System in Greenhouse Fed by an Axial Air Extractor

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Abstract : The residual wind energy recovery from axial air extractors in greenhouses represents a constant source of clean energy production, which reduces production costs by reducing energy consumption costs. The objective of this work is to design, build and evaluate a residual wind energy recovery system. This system consists of a wind turbine placed at an optimal distance, a cone in the air discharge and a mechanism to vary the blades angle of the wind turbine. The system energy balance was analyzed, measuring the main energy parameters such as voltage, amperage, air velocities and angular speeds of the rotors. Tests were carried in a greenhouse with extractor Multifan 130 (1.2 kW, 550 rpm and 1.3 m of diameter) without cone and with cone, with the wind turbine (3 blades with 1.2 m in diameter). The implementation of the system allowed recovering up to 55% of the motor's energy. With the cone installed, the electric energy recovered was increased by 10%. Experimentally, it was shown that changing in 3 degrees the original angle of the wind turbine blades, the angular velocity increases 17.7%.

Keywords : air energy, exhaust fan, greenhouse, wind turbine

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