

Low Cost Wind Turbine Using Natural Fibre and Glass Fibre Composites for Irrigation and Farm Management

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Abstract India's new emphasis on multi-dimensional development of non-conventional energy is an open economy, for the growing energy need of more than 1000 million people may accelerate rapid utilization of available non-conventional sources of the energy. The search for alternative energy sources and technology that can help tap energy from sources hitherto not in use, has become especially relevant in the wake of the energy crisis in rural sector. In India, there are still one lakh villages where darkness is not dispelled by electricity. Moreover their remote location hinders any access to a grid. There are several energy production methods and only one of them or a hybrid system can be implemented by rural communities at an affordable investment. By using contra-rotating turbines energy capturing efficiency can increase for power generation i.e. electricity can be generated at low wind velocity as 3 meter per second. An effort has been made to produce low cost wind turbine of 0.80 kilowatts for domestic utilization, 3 kilowatts for farm management and pumping water for irrigation. This paper describes the techniques on how cost effective turbine blades are manufactured using wood, natural and glass fiber materials and cheap labor at remote sites. It also suggests the users of locally available material for building towers and turbines to improve the economy and provide employment opportunity to the folks of rural area. As details from experiments results showed this is cost effective technology to manufacture wind turbine for rural area.

Keywords Contra-rotating wind turbines; wind velocity; wind energy in agriculture; Renewable energy; natural and glass fiber composites.