Rerkset Taseemool 2014: A Study of Wind Turbines Implementation in Cotton Yarn Manufacturer. Master of Engineering (Industrial Engineering), Major Field: Industrial Engineering, Department of Industrial Engineering. Thesis Advisor: Mr. Punnamee Sachakamol, Ph.D. 125 pages.

This thesis presents a study of wind turbines implementation in cotton yarn manufacturer. For the study of technical wind turbine, it starts from the installation of anemometer to measure wind speed in factory. The potential wind energy was analyzed and evaluated for selecting the type and size of the wind turbine corresponding to cost and turbine efficiency. In analysis of financial worth on net present value, rate of return and payback period were employed. For analysis of environmental effect, carbon reduction will be estimated based on production of electricity from the installed wind turbines system.

The result of technical analysis shows that the average wind speed from air vent of factory is 10 m/s. Based on this wind speed, the appropriate model of wind turbine is 1 kW On/Off grid horizontal axis wind turbine system that turbine efficiency is around 80 percent of electric capacity. The installation of wind turbine should install at the middle of air vent. The size of wind turbines depend on the air vent area. For financial analysis aspect, net present value is 72,633.22 bath. Internal rate of return 11 percent is more than discount rate at 7.25 percent. In conclusion, the installation of wind turbines in this study is worth investment and payback period is 5 years and 6 months. For environment analysis aspect, the installation of 1 kW wind turbines in factory will help to reduce carbon emissions up to 3,933.64 kg CO_2e /kWh or 877.80 bath/year.

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