Windmill Efficiency: What Matters and What Doesn't

Recently a study was done, backed by the government, of course, to check out what influences the efficiency of a windmill and whether the experimental windmills (those with 2 turbine blades) were more efficient or less, when compared to the 3 blade turbines used in wind farms or other such quintessential windmills in use today.

It was found out that the experimental windmills, the ones with just two turbine blades on them were far less efficient than the three bladed ones or multi bladed ones. It was also realized that the efficiency of the windmill has to be measured on observation and not calculated. For this reason alone, the U.S government has spent a lot of money on researching the windmills and studying their efficiency. However, since it had taken into account only two bladed systems, the results were found abortive.

The overall efficiency of a windmill turns out to simply the amount of electricity that can be generated over a period of time on a cost basis. Two factors contribute to the efficiency of a windmill the ability of the windmill to utilize low velocity wind and the other was its conversion efficiency. While the first one tested the windmill on its productivity of being able to convert slow speed and velocity winds (Which is the case most of the time) the second involves the efficiency with which the turbine's rotational motion is transferred onto create a mechanical energy, capable of achieving the desired result.

It can be easily understood on plain observation that huge structures do not add to up to the costs incurred and do not bring in any added efficiency. It all boils down to simple, ample sized, adequately numbered turbine blades, enough such that even the slightest of the winds can induce motion to the turbines and proper gearing systems to contribute to the high conversion ratio.

With the rapid depletion of fossil fuels and the increasing demands to find reliable sources of energy, the efficiency of a windmill to be able to produce electricity with justifiable costs and expenses to the amount of electricity produced becomes increasingly critical. It is also a very apt commercial criterion to rate windmills which will happen soon due to the ever increasing adaptation of windmills to most energy requirements, especially in rural America.

Starting with simple uses and applications like grinding and pumping, the windmills have evolved into a very clean and green, renewable source of electricity. Its rapid commercialization is being seen as signs to come and could turn out to be a formidable source for generating electricity in the future, just as it had been a valuable resource for pumping water into wells for further heating to be converted into steam for steam locomotives, in the years gone by.

About the Author

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