Original Article

Statistical Modelling of Long-Term Wind Speed Data

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ABSTRACT

The attention of most countries of the world has been shifted towards reducing the occurrences of greenhouse gasses, developing of renewable energy and energy efficiency towards building a sustainable energy in the near future. Wind energy as one of these renewable is perhaps the most suitable, clean and environmental friendly. In modeling wind speed, Weibull function is the most widely adopted model in the scientific literatures, however, other statistical functions are also need to be considered and judged their suitability based on certain criteria. In this study, five statistical models were selected for modeling of Miri wind speed data for a period of ten years. Distribution Function (PDF) and Probability (PP) plots are employed to verify the Goodness of fit (GOF) for the distributions. Lastly, graphical and GOF outcomes are compared, suggesting that, Lognormal and Gamma distributions are found to be most appropriate as compared to the Weibull, Rayleigh and Erlag distributions.

Keywords: Renewable energy, Wind energy, Distribution model, Malaysia, Miri.

INTRODUCTION

As a consequence of present day energy requirement and increasing environmental awareness, it's become very important to complement our energy base with clean and renewable sources. Speedy advancement of human population and industrialization, the energy needs are growing exponentially, causing an increase in environmental pollution. In certain places, power generation is not often enough to satisfy even the minimum requirement, causing social problems in those areas.

For this reason, progression in the wind energy technology has produced it substitute to traditional energy resources in recent times. Similar to this development, wind energy conversion systems (WECS) make a tremendous participation in everyday life in producing countries, where one third of the world's people live without electricity. Wind is certainly one of the prospective alternative energy sources that may be harnessed in a small, medium and commercial ways.