

Evaluating the Effect of Splitting Wind Farms on Power Output

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Abstract : Since worldwide demand for renewable energy is increasing rapidly because of the climate problem and the limitation of fossil fuels, technologies of alternative energy sources have been developed and the electric power network now includes renewable energy resources such as wind energy. Because of the huge advantages that wind energy has, like reduction in natural gas use, price pressure, emissions of greenhouse gases and other atmospheric pollutants, electric sector water consumption and many other contributions to the nation's economy like job creation it has got too much attention these days from different parts of the world especially in the United States which is trying to provide 20% of the nation's energy from wind by 2030. This study is trying to evaluate the effect of splitting wind farms on power output. We are trying to find if we can get more output by installing wind turbines in different sites rather than installing all wind turbines in one site. Five potential sites in Texas have been selected as a case study and two years wind data has been gathered for these sites. Wind data are analyzed and effect of correlation between sites on power output has been evaluated. Standard deviation and autocorrelation effect has also been considered for this study. The paper has been organized as follows: After the introduction the second section gives a brief overview of wind analysis. The third section addresses the case study and evaluates correlation between sites, auto correlation of sites and standard deviation of power output. In section four we describe the results.

Keywords : auto correlation, correlation between sites, splitting wind farms, power output, standard deviation

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