Abstract

The aim of this research project is to evaluate the potential of near-shore wind energy using prognostic and diagnostic modelling. The statistical wind speed obtained from observation in 2012 at 120 m at Pakphanang and Koh Phangan along with WindSim 4.6 and WAsP 11.0 wind flow modeling and prediction based on RAMS modeling along with NCEP/NCAR 2001-2010 are compared. The measure correlated predicted (MCP) is done also to reduce the uncertainty of wind speed.

Project analysis is executed in order to analyze the technical and economic aspects of a wind farm. The correlation coefficient (R^2) for Pakphanang is 0.6301 and for Koh Phangan is 0.687 respectively.

Results showed that the predicted results based on RAMS modeling is differed from the diagnostic model (WindSim and WAsP) resulting for estimated annual energy production (AEP) is also different. The capacity factor (C.F.) obtained from prognostic model is higher than results from diagnostic model at Koh Phangan. However, the C.F. obtained from prognostic model is less than the results obtained from diagnostic model at Pakphanang due to the flat terrain.

Economic analysis revealed that the investment with the project cost of a 10 MW wind farm was 65, 70, and 75 million Thai Baht and operation under wind resource of Koh Phangan and Pakphanang together with financial incentive is feasible.