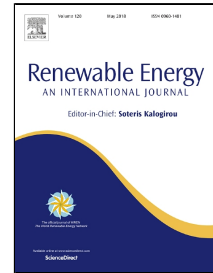


Accepted Manuscript

Wind Energy Research: State-of-the-Art and Future Research Directions

D.J. Willis, C. Niezrecki, D. Kuchma, E. Hines, S. Arwade, R.J. Barthelmie, M. DiPaola, P.J. Drane, C.J. Hansen, M. Inalpolat, J.H. Mack, A.T. Myers, M. Rotea



PII: S0960-1481(18)30193-9
DOI: 10.1016/j.renene.2018.02.049
Reference: RENE 9780
To appear in: *Renewable Energy*
Received Date: 17 September 2016
Revised Date: 05 January 2018
Accepted Date: 09 February 2018

Please cite this article as: D.J. Willis, C. Niezrecki, D. Kuchma, E. Hines, S. Arwade, R.J. Barthelmie, M. DiPaola, P.J. Drane, C.J. Hansen, M. Inalpolat, J.H. Mack, A.T. Myers, M. Rotea, Wind Energy Research: State-of-the-Art and Future Research Directions, *Renewable Energy* (2018), doi: 10.1016/j.renene.2018.02.049

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Wind Energy Research: State-of-the-Art and Future Research Directions

D.J. Willis¹, C. Niezrecki¹, D. Kuchma², E. Hines², S. Arwade³, R.J. Barthelmie⁴, M. DiPaola¹, P.J. Drane¹, C.J. Hansen¹, M. Inalpolat¹, J.H. Mack¹, A.T. Myers⁵, M. Rotea⁶

¹ University of Massachusetts Lowell, ² Tufts University, ³ University of Massachusetts Amherst, ⁴ Cornell University, ⁵ Northeastern University, ⁶ University of Texas, Dallas.

Abstract

This paper reports the findings from the *2016 Wind Energy Research Workshop* held in Lowell, MA. The workshop examined the state-of-the-art in wind energy research within the following three core topic areas: (A) Wind Turbine Design and Manufacturing including: blades, towers/foundations and nacelle, (B) Wind Farm Development including: offshore installations/siting, flow characterization and loads/waves/wind characterization, and (C) Wind Farm Operations including: controls, power production, wind farms, sensing, diagnostics, testing, structural health monitoring, reliability, energy storage, the grid and power transmission. Research challenges and future directions were discussed and are reported for each sub-topic area.

Keywords: Wind Energy; Resource; Design; Manufacturing; Operations;

List of Abbreviations

ACMA	American Composites Manufacturers Association
AC	Alternating Current
AEP	Annual Energy Production
AMO	Advanced Manufacturing Office
ANSI	American National Standards Institute
API	American Petroleum Institute
AWEA	American Wind Energy Association
BAAM	Big Area Additive Manufacturing
BOEM	Bureau of Ocean and Energy Management
BRC	Blade Reliability Collaborative
BSH	German Federal Maritime and Hydrography Agency
CFD	Computational Fluid Dynamics
CFR	Code of Federal Regulations
CMS	Condition monitoring systems
CNC	Computer Numerical Control
CREW	Continuous Reliability Enhancement for Wind
DC	Direct Current
DD-RANS	Data-driven Reynolds-averaged Navier–Stokes model
DONG	Danish Oil and Natural Gas (DONG) Energy
DNS	Direct Numerical Simulation (of Navier-Stokes Equations)
FLORIS	FLOw Redirection and Induction in Steady state
GIS	Geographic Information System

Download English Version:

<https://daneshyari.com/en/article/6764275>

Download Persian Version:

<https://daneshyari.com/article/6764275>

[Daneshyari.com](https://daneshyari.com)