

## 2015 Wind Energy Systems Engineering Workshop

The 3rd Wind Energy Systems Engineering Workshop will take place on the 14th and 15th of January 2015. NREL is partnering with DTU wind energy to co-host the third biennial event which will broaden the international perspective of the workshop. This year's theme will be on exposing interactions in wind energy systems and exploring how different wind energy stakeholders addressing them in new, integrated and innovative ways. Highlights include a variety of expert panel sessions on topics such as cost of energy in today's wind systems, challenges and uncertainty in wind system design and operation, evolution of wind system standards and design methodologies, tools and methods for integrated wind system design and analysis, and integrated design of wind systems from components to turbines to plants to operations.

### Tentative Agenda (Updated Nov. 20<sup>th</sup>, 2015)

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Day 1: January 14 <sup>th</sup> , 2015	
8:30 am – 9:30 am	<b>Day 1 Opening Remarks</b> Pierre-Elouan Réthoré, DTU Wind Energy <b>Opening Keynote Address:</b> “Challenges and perspectives in future wind turbine technology and the role of system engineering” Flemming Rasmussen, DTU Wind Energy
<b>Theme 1: Challenges and Uncertainty Facing Today’s Wind Energy Systems</b>	
9:30 am – 10:30 am	<b>Session 1: Cost of Energy for Wind Systems Today</b> <b>Moderator:</b> Christopher Mone, NREL National Wind Technology Center Maureen Hand, NREL National Wind Technology Center Bruce Valpy, BVG Associates Ltd Todd Griffith, Sandia National Laboratories
10:30 am – 10:45 am	<b>Break</b>
10:45 am – 12:00 am	<b>Session 2: Wind Plant Uncertainty – Wind Resource and Financing</b> <b>Moderator:</b> Patrick Moriarty, NREL National Wind Technology Center Matthew Hendrickson, Vaisala Inc. Taylor Geer, DNV GL – Energy Michael Brower, AWS Truepower Erik Hale, EDF Renewable Energy
12:00 pm – 1:00 pm	<b>Lunch</b> <b>Lunch Keynote:</b> “A Vision for Systems Engineering Applied to Wind Energy” Fort Felker, NREL National Wind Technology Center
1:00 pm – 1:15 pm	<b>Break</b>
1:15 pm – 2:15 pm	<b>Session 3: Wind Plant Uncertainty – Reliability and Operations</b> <b>Moderator:</b> Shawn Sheng, NREL National Wind Technology Center Carsten Westergaard, Sandia National Laboratories AnneMarie Graves, Upwind Solutions Keith Parks, Xcel Energy
<b>Theme 2: System Design Methods, Tools and Processes</b>	
2:15 pm – 3:15 pm	<b>Session 4: Evolution of Wind Turbine Standards and Design Methodologies</b> <b>Moderator:</b> Paul Veers, NREL National Wind Technology Center Sandy Butterfield, Boulder Wind Consulting Kenneth Thomson, DTU Wind Energy Graeme McCann, DNV GL - Energy

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<b>3:15 pm – 3:30 pm</b>	<b>Break</b>
<b>3:30 pm – 4:30 pm</b>	<b>Session 5: Tools for Integrated System Design</b> <b>Moderator:</b> Pierre-Elouan Réthoré, DTU Wind Energy Urs Wihlfahrt, Fraunhofer-Institut Karl Merz, SINTEF Energy Research Katherine Dykes, NREL National Wind Technology Center
<b>4:30 pm – 5:30 pm</b>	<b>Session 6: Addressing Uncertainty in the Design Process</b> <b>Moderator:</b> Peter Graf, NREL National Wind Technology Center Pierre-Elouan Réthoré, DTU Wind Energy Paul Constantine, Colorado School of Mines Paul Fleming, NREL National Wind Technology Center
<b>5:30 pm – 5:45 pm</b>	<b>Break / Transfer to Reception Location</b>
<b>5:45 pm – 7:30 pm</b>	<b>Evening Reception and Poster Session</b> Please email poster abstracts to <a href="mailto:systems.engineering@nrel.gov">systems.engineering@nrel.gov</a>

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**Day 2: January 15<sup>th</sup>, 2015**

<b>8:30 am – 9:30 am</b>	<b>Day 2 Opening Remarks</b> Shreyas Ananthan, DOE EERE <b>Opening Keynote Address: “A New Vision for United States Wind Power”</b> Jose Zayas, DOE EERE
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**Theme 3: Integrated Design for Wind Energy Systems in Practice**

<b>9:30 am – 10:30 am</b>	<b>Session 7: Component Level Design in System Contexts</b> <b>Moderator:</b> Rick Damiani, NREL National Wind Technology Center Tristan Dhert, University of Michigan Kristian Dixon, Siemens Energy Inc. Peter Bæk, LM Wind Power
<b>10:30 am – 10:45 am</b>	<b>Break</b>
<b>10:45 am – 11:45 am</b>	<b>Session 8: Turbine Level Integrated Design Approaches I</b> <b>Moderator:</b> Katherine Dykes, NREL National Wind Technology Center Frederik Zahle, DTU Wind Energy Brian Resor, Sandia National Laboratories Andrew Ning, Brigham Young University
<b>11:45 am – 12:00 pm</b>	<b>Break</b>
<b>12:00 pm – 1:00 pm</b>	<b>Session 9: Turbine Level Integrated Design Approaches II</b> <b>Moderator:</b> Daniel Laird, Sandia National Laboratories Patrick Riley, GE Global Research Jon Campbell, Alstom Power Inc. James Allison, University of Illinois
<b>1:00 pm – 1:15 pm</b>	<b>Closing Remarks</b> Paul Veers, NREL National Wind Technology Center

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**Follow-On Tutorials: January 15<sup>th</sup>, 2015**

<b>2 pm – 6 pm</b>	<b>Python for Wind Energy</b>
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**Follow-On Tutorials: January 16<sup>th</sup>, 2015**

<b>8 am – 12 pm</b>	<b>OpenMDAO for Wind Energy</b>
<b>1 pm – 5 pm</b>	<b>Integrated System Modeling for Wind Energy with WISDEM and TopFarm</b>