Introduction to the special issue of *Wind Engineering* related to the 2017 NAWEA symposium

The North American Wind Energy Academy (NAWEA) was established in 2013 and has as its purpose to "facilitate the continued growth of wind power as a cost-effective, high-penetration, sustainable national energy source producing over a third of North America's electricity needs by 2050." To meet this aggressive, yet achievable energy goal "the academy will expedite the creation of a critical new wind energy research and development agenda that bridges education, multiple disciplines, and diverse organizations, and fosters national and international collaborations."

As of 2017 in the United States, wind power produced just over 6% of the electrical energy consumed nationally and was consequently the third largest employer in the electric power generation sector. In Canada, wind power provided over 5% of the electrical energy, while in Mexico it produced only a fraction of a percent. As you can see, wind energy has arrived as a mainstream electrical energy source, yet still has quite a ways to go to reach a third of the North American supply, and there are projections that it will grow even higher. To get there will require a dramatic transition in our energy supply that will necessitate a drastic expansion of a highly qualified workforce. Highly educated individuals are needed both to facilitate the deployment and operation of existing wind energy technology and also to conceptualize and ultimately realize progressively larger and technologically more sophisticated turbines, both onshore and off. As the fraction of energy supplied by wind power grows, there are significant scientific and engineering challenges to be addressed related to rotor blades, materials, structures, grid integration, wind power forecasting, control systems, and energy storage to name a few. New business models will emerge and the organization and management of the power system will change.

A key activity undertaken by NAWEA to address these challenges and promote a smooth transition is its biennial NAWEA Wind Energy Symposium. The symposium is a forum for exchanging ideas, identifying research needs, forming collaborations, educating aspiring students, and inspiring researchers, business people, and academicians to push the forefront in wind energy. The 2017 edition of the NAWEA Symposium was held in September in Ames, Iowa, hosted by Iowa State University. The symposium was held over 4 days and included 15 technical sessions with a total of 72 presentations, a student poster competition, and four workshops. Twenty-seven universities and several professional organizations including the National Renewable Energy Laboratory and Sandia National Laboratories participated, with university participants from across the globe. Just as wind energy itself is multi-disciplinary, the sessions covered a broad array of topics ranging from atmospheric sciences, to wind turbine aerodynamics and components, to electrical grid integration, environmental impacts, policy, education, and workforce development.

For this special issue of the *Wind Engineering*, several papers from the symposium were submitted for consideration and six were selected representing the variety of topics presented at the meeting. These articles range from innovative techniques for measuring wind turbine wakes, to describing methods and results for analyzing wind turbines and their blades, results from a unique wind resource assessment, and presentation of the compelling need for university educational programs in wind energy. The editorial board hopes you find these articles useful and educational and will bring you more in the future. The next NAWEA Symposium is planned for October 2019 to be hosted by the University of Massachusetts Amherst. Hope to see you there.

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