



WIND ENERGY RESEARCH & DEVELOPMENT

Workforce Development

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Workforce Development



Workforce Analysis

Identifying land-based and offshore wind energy workforce needs and trends for industry, educational institutions, and the potential workforce



Workforce Pathway Development

Supporting development and documentation of STEM-focused educational pathways, providing streamlined processes for new students and transitioning energy professionals



Workforce and Educational Program Development

Developing and implementing innovative, hands-on educational programs that help prepare the future wind energy workforce



Workforce Analysis

- NREL collects data from industry, educational institutions, and the potential workforce using qualitative and quantitative methods
- NREL analyzes workforce data to understand the wind energy workforce from a national perspective
- Our team shares key insights to support a growing industry and inform the workforce pipeline.

Areas of Expertise

- Workforce needs assessments
- Occupation and skills mapping
- Education and training programs catalog
- Data analysis on workforce trends
- Estimating potential job growth—technology and development approach.

Current Projects

Wind Workforce Research



Workforce Analysis



CHALLENGES

- 68% of wind industry employers report some or great difficulty finding qualified applicants to fill positions
- Wind and renewable energy graduates report difficulty finding jobs in the wind industry
- These two factors suggest a wind workforce gap.

APPROACH

To gather data on the reasons behind the wind workforce gap, NREL worked with a third-party research firm to develop survey instruments for the wind industry and potential workforce:

- Industry survey—296 responses from 9 industry segments representing 24 occupations
- Potential workforce survey—Defined as students and recent graduates from U.S. vocational schools, community colleges, and universities; 770 responses from more than 70 U.S. educational institutions

IMPACT

- Provides valuable information to industry, educational institutions, and the potential workforce
- Informs industry about needs, awareness of U.S. wind educational programs, and hiring processes
- Provides perspectives of the potential workforce on difficulty finding jobs and interest in the industry
- Offers insights that will help refine programs and initiatives aimed at narrowing the wind workforce gap.



Workforce Pathway Development

NREL supports the development and documentation of STEM-focused educational pathways that help students, transitioning professionals, and educators understand the wind energy workforce and the skills needed to be successful

- KidWind and the NEED project—provide teachers wind energy curriculum, professional development, and challenges for 6th–12th-grade students
- North American Wind Energy Academy (NAWEA)—supports communication and collaboration among researchers, academia, and graduate students.

Areas of Expertise

- Wind-focused educational activities
- Skill-pathway development
- Stakeholder engagement around wind energy workforce needs, benefits, and challenges.

Current Projects

NEED: Supporting Teachers and Students in Distance Learning



Workforce and Educational Program Development



CHALLENGE

In spring 2020, parents and educators struggled to transform in-classroom education into effective distance learning.

APPROACH

- NREL provided funding to help National Energy Education Development (NEED) develop insightful curriculum to meaningfully engage primary- and secondary-level students on clean-energy topics.
- For one lesson geared toward 4th–8th graders, students used paper cups, pins, clear tape, and other household items to build an anemometer that measured wind speed.

IMPACTS

- By supporting teachers in a new, distance-learning environment, NEED provided productive ways to teach about energy and other STEM fields.
- Hands-on lessons allowed students to engage in fun activities that introduced them to wind while supporting STEM pathways into the wind industry.



Workforce and Educational Program Development

Working with industry and academia, NREL supports the development and implementation of innovative, hands-on, educational programs that help address the need for highly skilled workers for the growing wind energy industry

- Collegiate Wind Competition—since 2014, allows college students to gain direct, interdisciplinary wind energy experience
- Wind for Schools program and Wind Application Centers—help universities in wind-rich areas develop wind-focused educational programs while supporting education at primary and secondary schools.

Areas of Expertise

- Workforce program development
- Active student engagement
- Industry, academia, and student collaboration
- Prize and competition development and implementation.

Current Projects

Collegiate Wind Competition



Workforce and Educational
Program Development



CHALLENGE

As the U.S. power-generation mix incorporates more wind energy, qualified workers will be needed to fill related jobs at all levels.

APPROACH

- The Collegiate Wind Competition prepares participating students to enter the wind-industry workforce
- To safeguard the health and safety of all participants, the Collegiate Wind Competition 2020 was held virtually
 - Teams competed in a series of challenges, including designing a model wind turbine based on market research and siting considerations
 - A panel of wind industry leaders judged their work.

IMPACTS

- Students gain hands-on experience finding solutions to real wind industry challenges by collaborating with their multidisciplinary team
- The opportunity to work toward goals, apply knowledge to problem solving, and earn recognition for succeeding are invaluable for today's graduates.

Accomplishments & Impacts



NREL's expertise in workforce and educational program development makes us uniquely qualified to:

- Develop educational programs—NREL's experts create hands-on, multi-disciplinary programs and competitions that help hundreds of students each year gain relevant wind energy experience.
- Implement prizes and competitions—NREL catalyzes investments of educational programs across the country to support expanded wind energy education from primary school through post-graduate research, directly helping to attract the next generation of wind energy leaders.
- Increase interest in wind energy careers—NREL helps industry, academia, and government organizations understand wind and renewable energy workforce development needs, while supporting the development of industry-relevant educational programs that raise awareness of wind-energy-career possibilities among students.



Through the Collegiate Wind Competition, Wind for Schools program, and Wind Application Centers, NREL collaborates with industry and academia to implement workforce development programs that meet the need for a highly skilled wind energy workforce.