

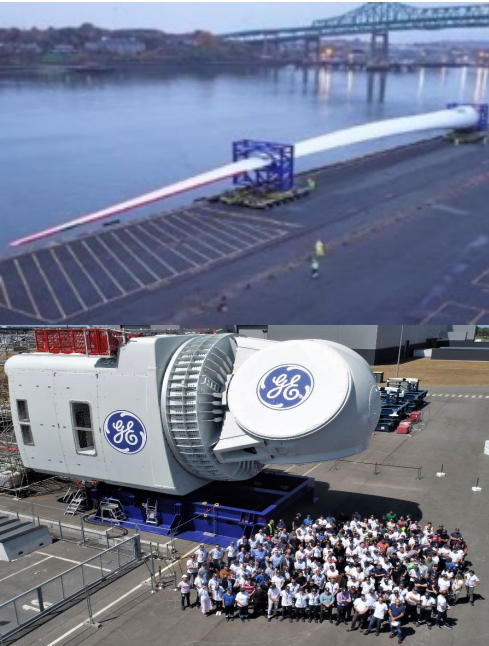
## E22 – Wind for Schools

Mitigate Market Barriers – Stakeholder Engagement & Workforce Development

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National Renewable Energy Laboratory (NREL)

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# FY21 Peer Review - Project Overview

### Project Summary:

The U.S. Department of Energy (DOE) Wind for Schools (WfS) Project aims to develop the future wind energy workforce through a multi-faceted approach delivered by Wind Application Centers (WACs) at universities and educational institutions spread across 12 states. Since its inception in 2005, the Wind for Schools and Workforce Development projects have evolved from creating and enhancing endeavors to support the growth of wind energy workforce pathways to the analysis of the growing workforce of both land-based and offshore wind industry sectors. The Wind for Schools project is working to successfully transition and support the Wind Applications Centers to sustainable organizations like Renewable Energy Powering Schools (REpS) and state consortia.

Key Project Partners: Renewable Energy Powering Schools (REpS), KidWind, National Energy Education Development, 12 WAC at leading land grant Universities, wind and solar industry groups through state WAC consortia.

### Project Objective(s) 2019-2020:

- Identify Domestic Wind Energy Education Training and Workforce Needs
- Bridge Gaps among Industry, Workforce, and Educational Institutions
- Increase Wind Energy Exposure and Engagement at Educational Institutions
- Update a wind workforce strategy for WETO

### Overall Project Objectives (life of project):

- Conduct technical workforce focused **Analysis**, **Convene** key stakeholders to help address industry workforce gaps, **Catalyze** projects and conduct facilitated outreach to **Communicate** with a broad range of direct and indirect stakeholders.

Project Start Year: FY2019  
Expected Completion Year: FY2022  
Total expected duration: 4 years

FY19 - FY20 Budget: \$2,828,241

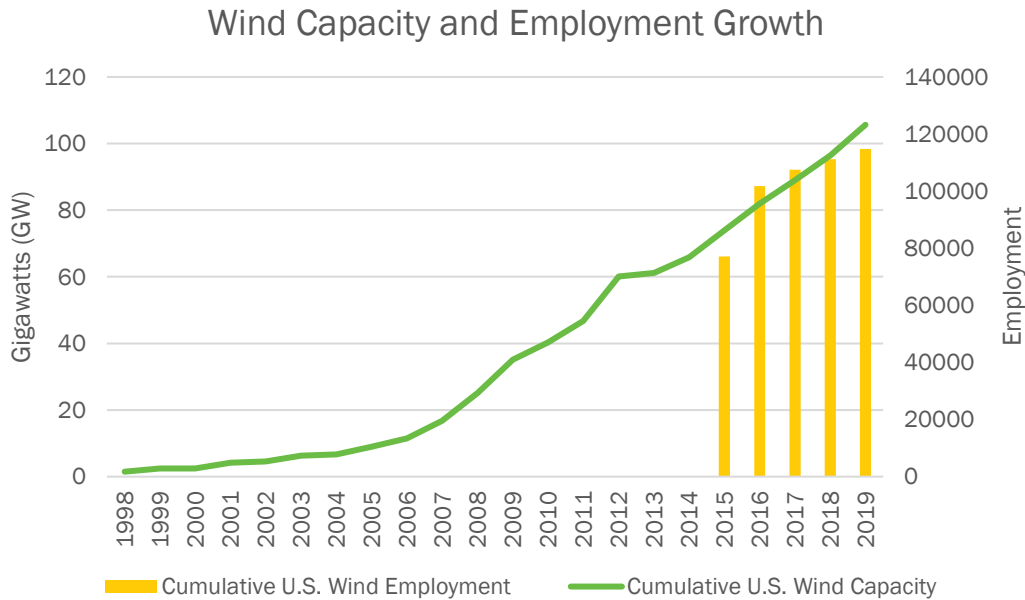
Key Project Personnel: Corrie Christol, Jeremy Stefek, Heidi Tinneland, Ruth Baranowski, Chloe Constant, Elise DeGeorge, Elizabeth Gill, Frank Oteri, and Ian Baring-Gould.

Key DOE Personnel: Jocelyn Brown-Saracino

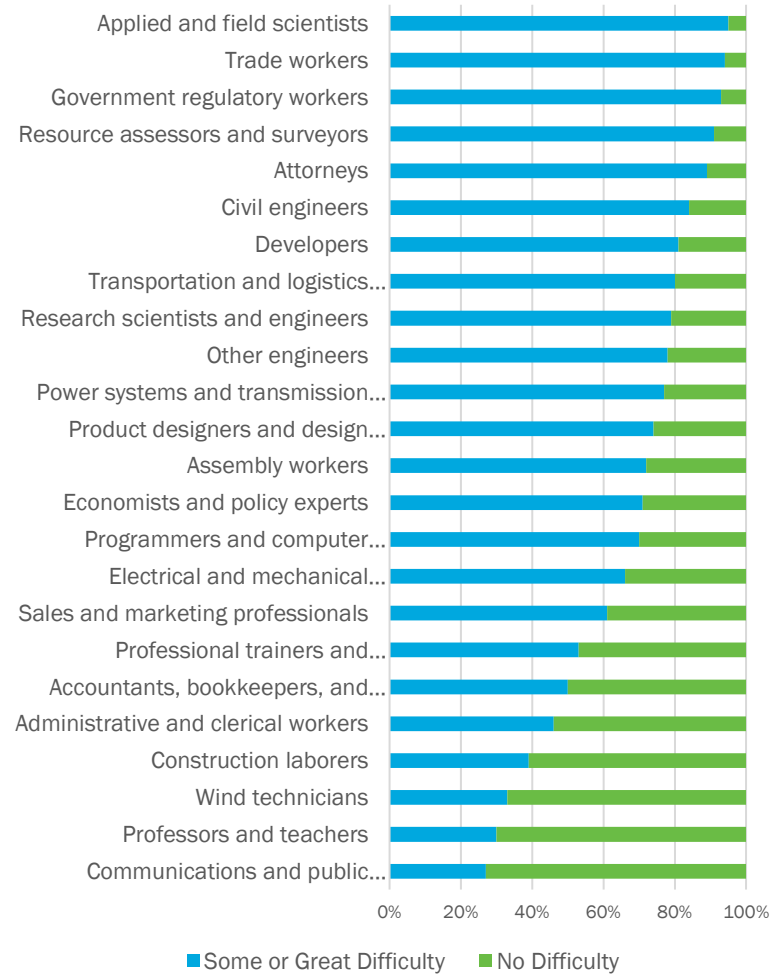


# Project Impact

- An expanding wind market adds stress to an already stressed industry, specifically for skilled workers that represent the American workforce.
- Reaching industry and government goals will require a huge expansion of the wind (and other RE) workforce.



Increasing trends for wind capacity and employment are expected to continue into the future (Wiser et al. 2020)



Based on industry surveys, the wind industry continues to have difficulty in identifying particularly high skilled workers (Keyser and Tegen 2019)

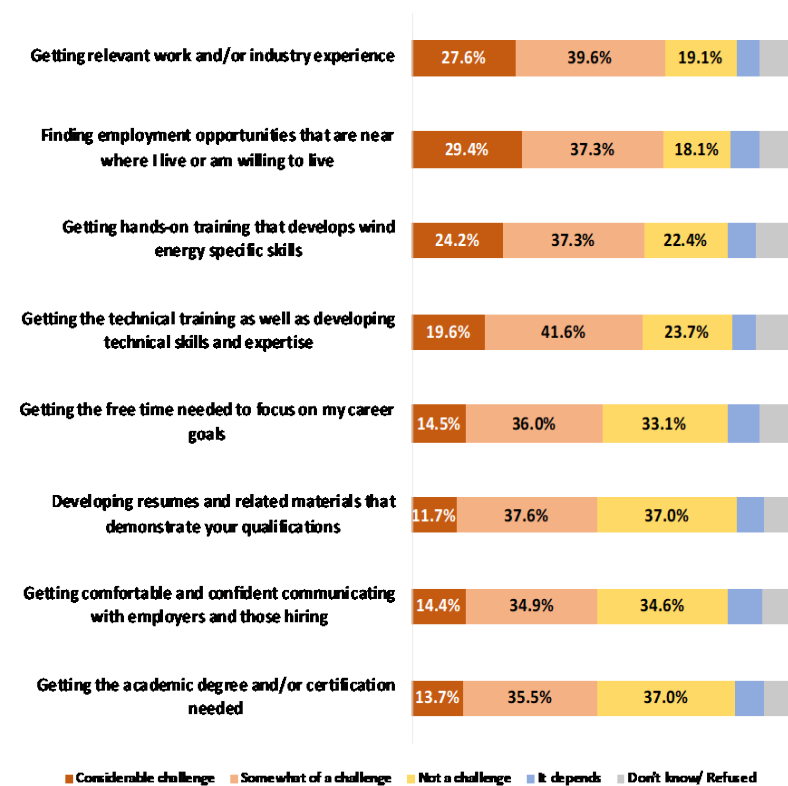
# Project Impact (2 of 3)

## Identify Domestic Wind Energy Education Training and Workforce Needs

- Publication of updated report of wind workforce needs (2019)
- Conducted first detailed analysis of university students relating to wind energy (2019)
- Published assessment of wind energy workforce needs for wind plant O&M (2020)
- Implemented the first national assessment of offshore wind workforce needs (2019-2020)

## Bridge Gaps among Industry, Workforce, and Educational Institutions

- Support for increased workforce development via outreach to student service and resource offices/staff at higher education institutions connecting them with high-impact events, such as the Collegiate Wind Competition
- Pavilion at Clean Power Conference 2019, Facilitated workforce session at BNOW and CleanPower (2019 and 2020)
- Supported the continued development of the North American Wind Energy Academy (NWEA), including hosting workforce development sessions at the 2019 NAWEA/WindTech Conference
- Implemented State based wind workforce industry consortia in 9 of 12 WfS states



Understanding why students are not able to find work in the wind industry will be key to industries success in finding needed talent (work of Stefek et al 2019 & 2020)

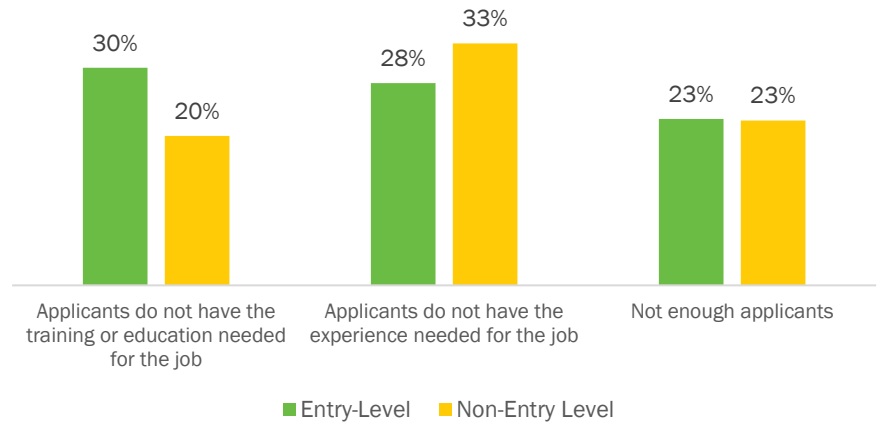
Student visit to the Massachusetts Blade Test Facility following 2019 NAWEA/WindTech Conference, a first introduction of many students to full scale wind turbine technology



# Project Impact (3 of 3)

## Increase Wind Energy Exposure and Engagement at Educational Institutions:

- Implementation of REpS through the creation of a new non-profit entity that provides avenues for transition of WAC and support educational programs nationwide, allowing engagement from new states and educational entities as financial contribution to existing university programs decreases
- Maintain active and healthy WAC in historically states by transitioning transition to REpS.
- Partnership with KidWind provides additional opportunities for students from K-12 and Higher Education to share experiential learning.
- Partnership and support with National Energy Education Development provides connection to land-based and offshore wind curriculum development in direct connection with educators.



*Industry Needs more entry level people with wind experience:*

**Manufacturing** → Enough applicants, lack training

**Construction** → Not enough applicants

**Development & siting** → Enough applicants, lack education

**Operations and asset management** → Enough applicants, but they lack experience

**R&D** → Enough applicants, but they lack education

**Education/training/advocacy** → Not enough applicants.



**WETO Educational programs introduce students from across the educational spectrum to wind energy and provide them the basic experience they will need to play a leading future role.**

**North Carolina WAC students  
Doing research on Beach Mt**

**KidWind student with her turbine**

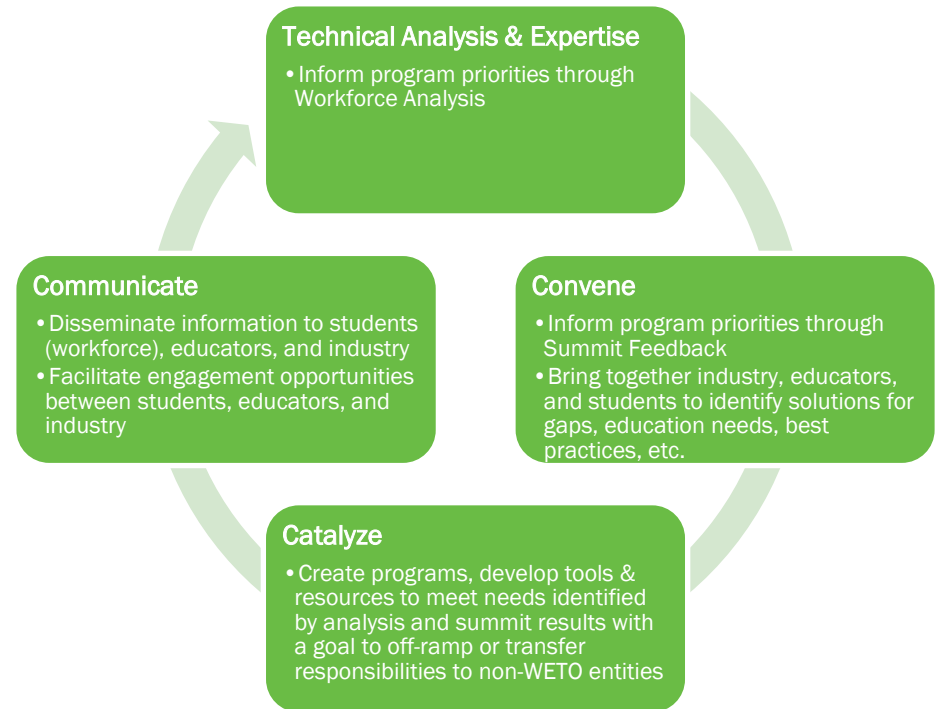


# Program Performance – Scope, Schedule, Execution

Building on the results of the 2018 Wind Workforce Assessment – NREL conducted a full review of Workforce Efforts

- Focus on Appropriate Role: Analyze, Convene, Catalyze, and Outreach
- Redefine Key Objectives to align with identified industry needs
- Expanded work with the wider industry, trade associations, and professional societies to support the development of a skills framework and workforce gaps analysis relating to offshore wind development

NREL workforce efforts initiated a transition starting in 2019 from one focused on the historical Wind for School model to focus more on national wind educational needs and expanding workforce efforts into offshore



# Program Performance – Scope, Schedule, Execution

FY19 – Engagement with students across academic levels

- 120+ university courses and events providing wind and solar education - 1300 students learning about wind energy
- 167 K-12 WAC supported events, 6570 + students introduced to wind energy concepts
- 30 teacher workshops, with 584 k-12 teachers participating
- 62 outreach activities with over 6,410 people engaged

FY20 – Switch to a virtual world allows assessment of workforce needs

- NREL and BNOW Offshore Wind Workforce Summit
  - Pivot to a virtual platform, bringing over 50 experts together
  - Sessions focused on identifying critical occupations, roles, education/training, and opportunities for collaboration for a new Offshore wind workforce
- Workforce Gap report has led to further development of gaps analysis
  - Initial research identified gaps for which has led to deeper research and analysis
  - Data collection leading to two technical reports in FY21/FY22

	North American Wind Energy Academy	KidWind (K-12)	Wind for Schools	Wind Application Center	Degree Program Specific to Wind Energy	Courses/ Seminars in Wind Energy
Improved my ability to find a job	54.5%	23.1%	74.3%	44.4%	67.6%	48.0%
Expanded my network of people that I could connect with	76.9%	30.8%	80.0%	60.0%	79.4%	49.1%
Increased my interest in a career	84.6%	42.9%	82.9%	73.3%	85.3%	56.0%
Developed valuable skills that I use	84.6%	53.8%	85.7%	80.0%	86.7%	77.3%
Increased my awareness of career opportunities	92.3%	69.2%	87.1%	86.7%	91.2%	82.7%
Provided me a valuable educational opportunity	92.3%	76.9%	88.6%	86.7%	91.2%	94.7%

**DOE Programs are effective at preparing students for the wind industry. Program Experience related to the wind industry – Total Level of Agreement. The percentages listed in this table include the sum of respondents that reported “strongly agree” and “agree.” (work of Stefek et al 2019 & 2020)**

# Project Performance - Upcoming Activities

- Workforce Gaps Analysis
  - Publish technical reports will be disseminated to industry and educational partners.
- Offshore Wind Workforce Roadmap and Network
  - Publish US offshore workforce needs and capabilities based on multiple offshore wind plant development scenarios will be disseminated to industry and education partners.
- Diversity, Equity, and Inclusion workforce research and application resources related to the Wind Industry are being explored as core values of the the Wind for Schools portfolio
- Energy Justice and considerations of Just Energy Transition from declining energy sources will be a focus of upcoming workshops and panels.
- Expand programs to engage more widely with academic institutions, including programs like WindU, a multi-university wind focused graduate consortia



Offshore Wind workforce development will play a key role as this industry expands, requiring a much better understanding of national workforce needs.



University of Nebraska students troubleshooting circuits  
*Photo credit: NE WAC*



# Stakeholder Engagement & Information Sharing

**NREL and WETO work closely with industry, trade associations and academia to tailor wind educational information, including Industry Advisory Boards**

- Collegiate Wind Competition
  - Implementation of industry and alumni advisory boards has provided programmatic insight and mentorship connections.
- Wind for Schools/RE Powering Schools
  - Since the creation of REpS, NREL has supported the creation of several industry advisory boards to aid in the raising of funds for self-sufficiency post-transition.



- Offshore Wind Workforce Network
  - Current advisory board members are contributors to this upcoming online connection resource
- Collaborations/Partnerships
  - American Clean Power Association
  - North American Wind Energy Association

# Key Takeaways and Closing Remarks

## Project Impact:

- Wind workforce analysis and research continues to identify connections to resources, workforce needs, and potential solutions.

## Project Performance:

- Offshore wind workforce roadmap and network
- The NREL wind workforce team is analyzing the needs of the offshore wind workforce and will be providing important connections for industry and workforce pathways.

## Stakeholder Engagement:

- Industry advisory boards
- Professional organization partnerships
- Offshore wind workforce network

