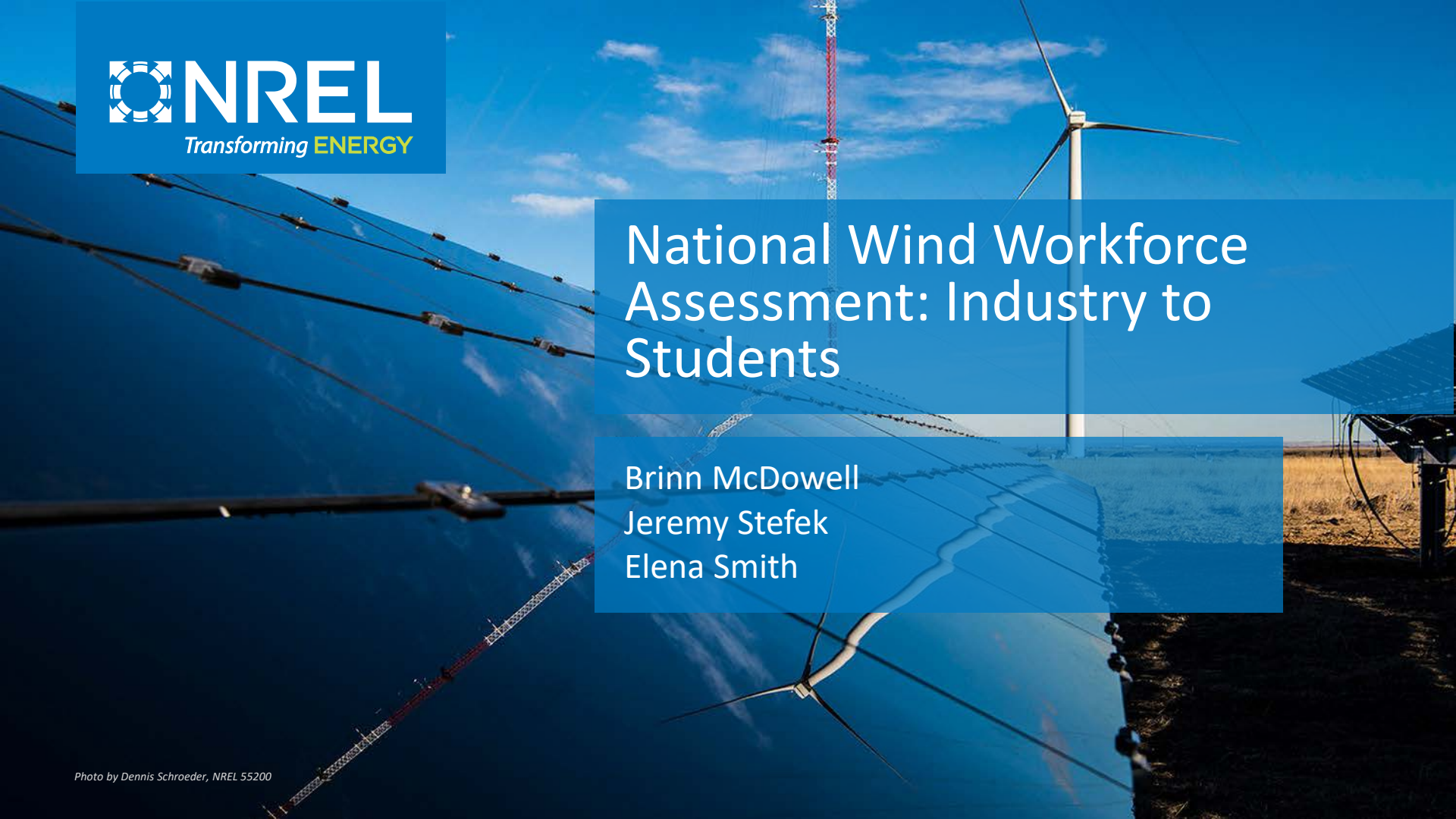

National Wind Workforce Assessment: Industry to Students

Brinn McDowell
Jeremy Stefek
Elena Smith

Photo by Dennis Schroeder, NREL 55200

Acknowledgments

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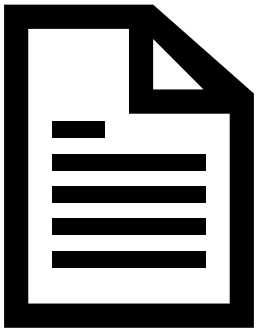
We would also like to thank Laura Hastings, Maya Whalen-Kipp, and Patrick Gilman (U.S. Department of Energy [DOE] Office of Energy Efficiency and Renewable Energy Wind Energy Technologies Office [WETO]) for supporting this research and providing valuable insight and feedback. We also appreciate Sheri Anstedt (NREL) for her editorial and technical review, John Frenzl and Jen Grieco for their graphics support, and Bobby Jeffers, Andre Fernandes Tomon Avelino, and Rebecca Hanes for their counsel on the development of the system dynamics model.

Finally, we thank the following individuals for their expert reviews including Chloe Constant, Brian Smith, and Daniel Laird. Any remaining errors or omissions are the responsibility of the authors.

How To Use

1 Read the presentation like a report



OR

2 Use the “Overview: Quick Click” slide to navigate through the presentation

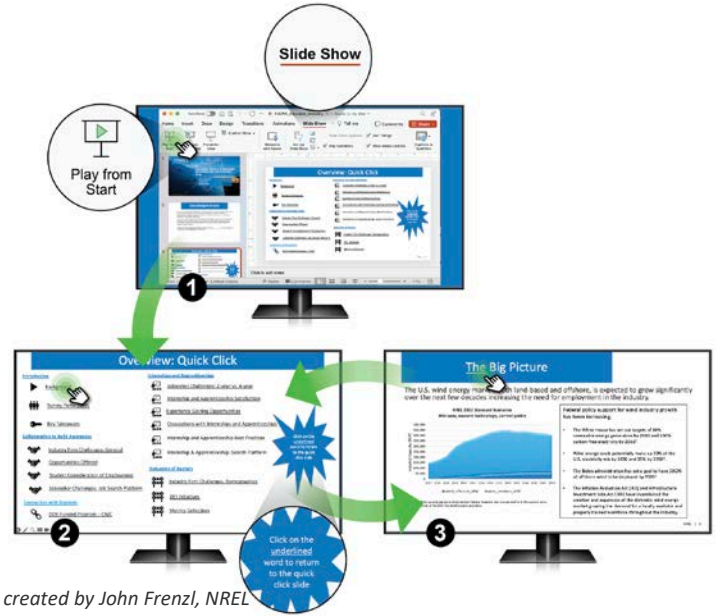


Image created by John Frenzl, NREL

Overview Quick Click

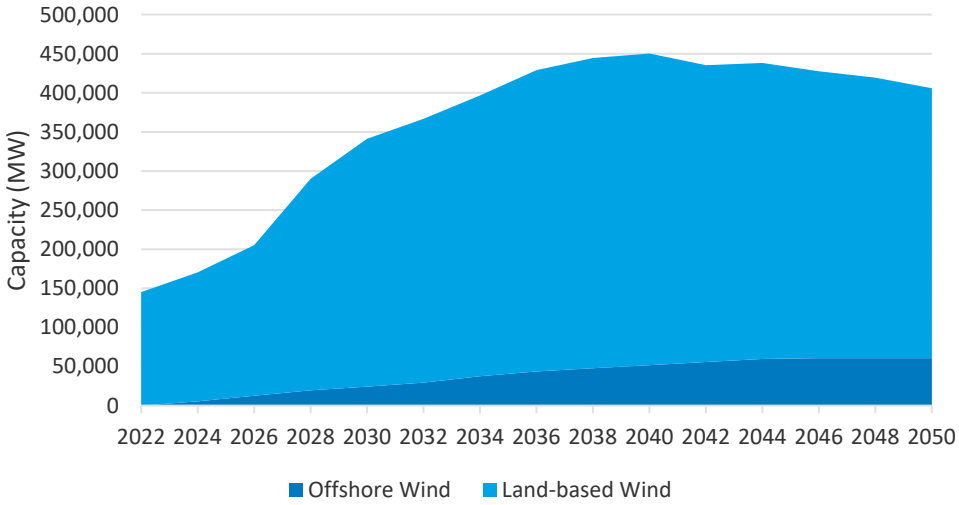
Click on the underlined word to return to the quick click slide

Introduction

The Big Picture

The U.S. wind energy market, both land-based and offshore, is expected to grow significantly over the next few decades, increasing the need for employment in the industry.

NREL 2022 Standard Scenarios
Mid-case, Nascent Technology, Current Policy



Graph from Gagnon et al. (2022)

The capacity additions driven by the Inflation Reduction Act are accounted for in the current policy scenarios of the 2022 Standard Scenarios projection.

Federal policy support for wind industry growth has been increasing.

- The White House has set targets of 80% renewable energy generation by 2030 and 100% carbon-free electricity by 2035 (White House 2021a).
- Wind energy could potentially make up 20% of the U.S. electricity mix by 2030 and 35% by 2050 (DOE-WETO 2017).
- The Biden administration has set a goal to have 30 GW of offshore wind be deployed by 2030 (White House 2021b).
- The Inflation Reduction Act and Infrastructure Investment Jobs Act have incentivized the creation and expansion of the domestic wind energy market, growing the demand for a locally available and properly trained workforce throughout the industry.

National Wind Workforce Assessment in Context

An **available** and **properly trained** workforce is needed for the success of the wind industry. However, past research has indicated that there is a **disconnect** between wind industry employers, the workforce, and educational institutions, which has been referred to as **the wind workforce gap**.

Wind workforce gap: Wind energy employers report having difficulty finding qualified candidates, while the potential wind energy workforce (e.g., students and recent graduates who are not yet working in the wind energy industry) report difficulty finding jobs, and educational institutions report having difficulty placing students in jobs (Stefek 2022).

Narrowing the gap could simultaneously (Keyser & Tegen 2019).

- Reduce recruitment costs for employers
- Help educational institutions fill classrooms
- Grow the domestic wind workforce by properly communicating wind industry careers to the potential workforce.

Previous Findings

Defining the Wind Energy Workforce Gap (Stefek 2022) indicated that the top three reasons for the workforce gap include experience, education and training qualifications, and geographic locations of jobs. This report expands on these findings.

	Experience	Education and Training	Geographic Location of Jobs
Industry	Experience was noted as a challenge for more than one-quarter of all wind industry firms looking for entry- (27.6%) and non-entry-level (33%) job applicants.	More than one-quarter of responding firms indicated that "there are enough applicants, but too many applicants do not have the training or education needed for the job" (29.7%).	The third highest reason among wind firms searching for both entry- and non-entry-level applicants was that there are not enough applicants for available positions in areas where wind is being developed.
Employee	Members of the total workforce (68%) responded that gaining applicable work experience is somewhat of a challenge or a considerable challenge when trying to find work opportunities in the wind industry.	Current and potential workers identified getting hands-on training (62%) or technical training (61%) to develop skills and expertise as a challenge or obstacle when searching for relevant opportunities in the wind industry.	Finding employment opportunities where one lives or is willing to live was ranked the second highest challenge for the total and potential workforce (67%) and the top challenge for the current workforce (64%).

Intended Audience and Contents

This report is intended for use by wind industry employers looking to gain insight into key levers that can influence hiring difficulty and actionable steps that can be taken to help narrow the workforce gap. More information can be found in complementary resources.

This presentation includes:

- Modeled scenario of wind workforce through 2050 based on business as usual (BAU)
- Current perception of the wind industry by the potential workforce
- Scenarios on how the workforce gap is affected by changing perceptions
- Current hiring difficulties faced by wind energy firms
- Current hiring difficulties faced by the potential workforce
- Connective actions for industry and education/training programs

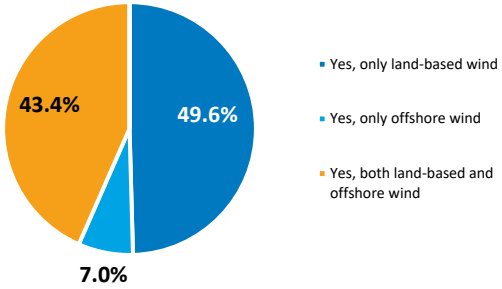
****The information presented in the report originates from the Fiscal Year 2022 survey effort conducted in partnership between NREL and BW Research Partnerships, in addition to various other resources such as the 2022 USEER Report, U.S. Department of Labor, and U.S. Department of Education. To learn more about the methodology behind data collection and workforce modeling, please refer to *National Wind Energy Workforce Assessment Methods Report: Surveys and System Dynamics Model* (McDowell and Stefek 2023).

Who Took the Survey?

Employer Survey (n=228)

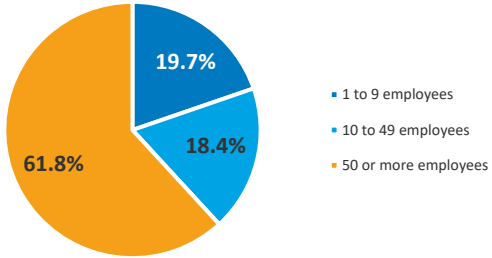
Involvement in Wind Energy Industry, 2022 (n=228)

Graph courtesy of BW Research Partnership



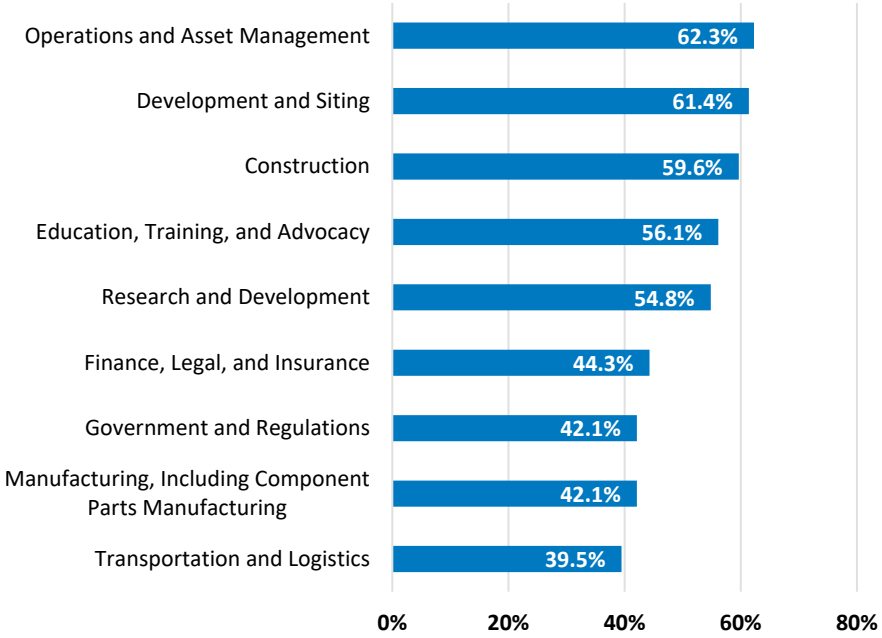
Number of Employees at Wind Energy Firms, 2022 (n=142)

Graph courtesy of BW Research Partnership



Involvement in Wind Industry Segments, 2022 (n=228)

Graph courtesy of BW Research Partnership

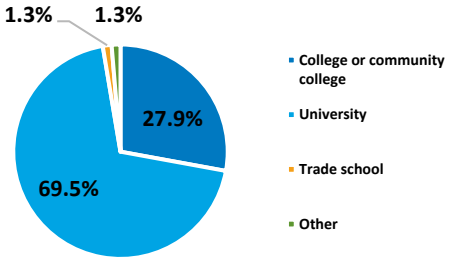


Who Took the Survey?

Student and Recent Graduate Survey (n=346)

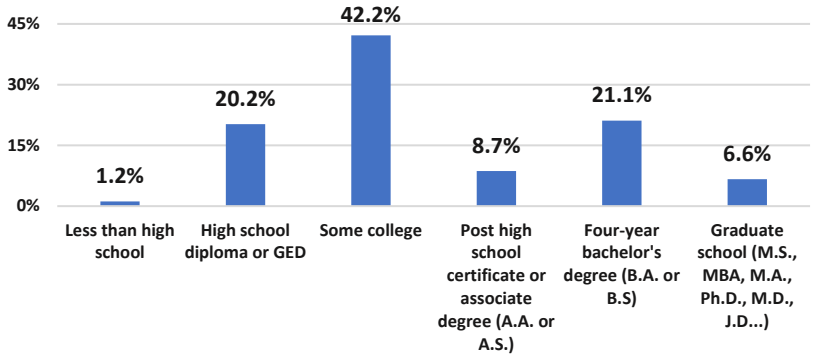
Type of School Attended, 2022 (n=226)

Graph courtesy of BW Research Partnership



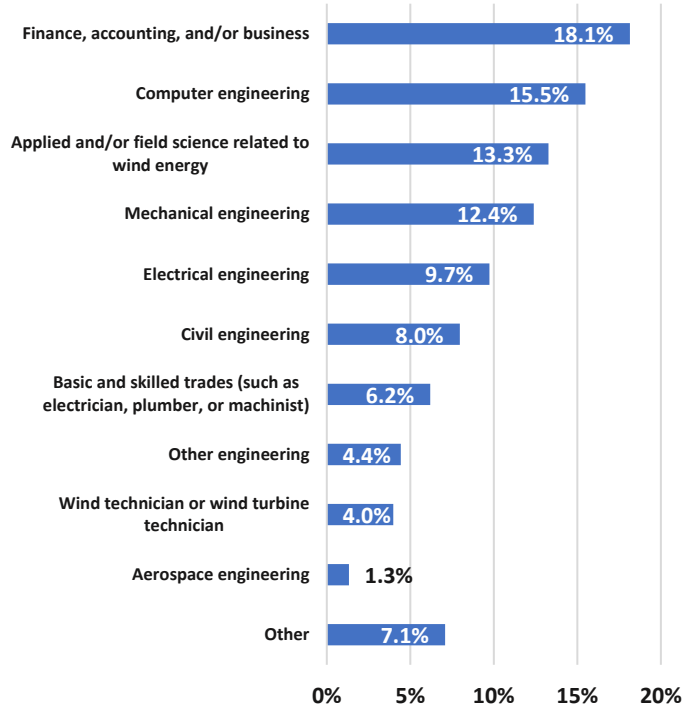
Last Educational Level Completed, 2022 (n=346)

Graph courtesy of BW Research Partnership



Degree Students and Recent Graduates were/are Working Toward, 2022 (n=226)

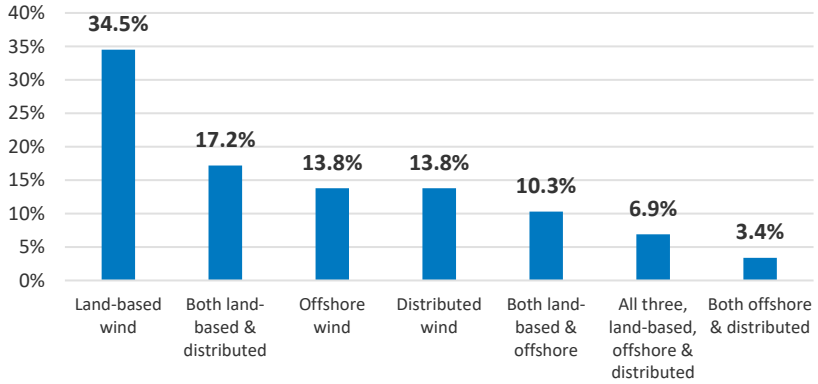
Graph courtesy of BW Research Partnership



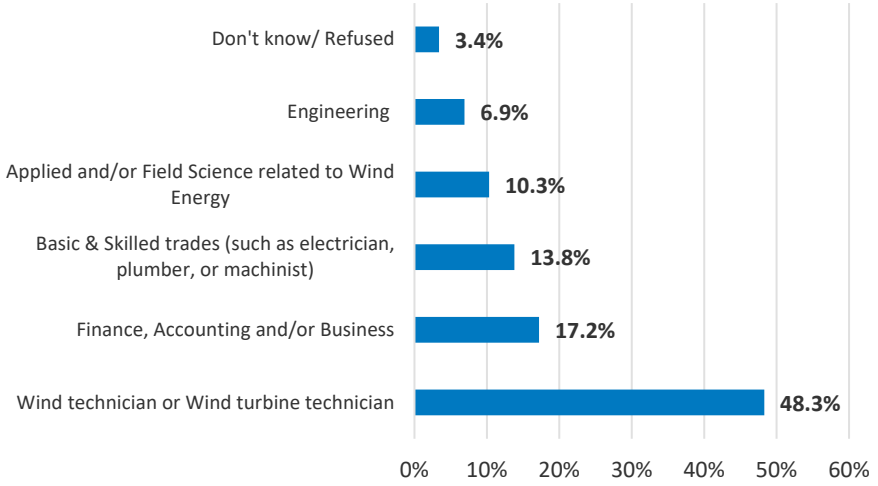
Who Took the Survey?

Current Worker Survey (n=29)

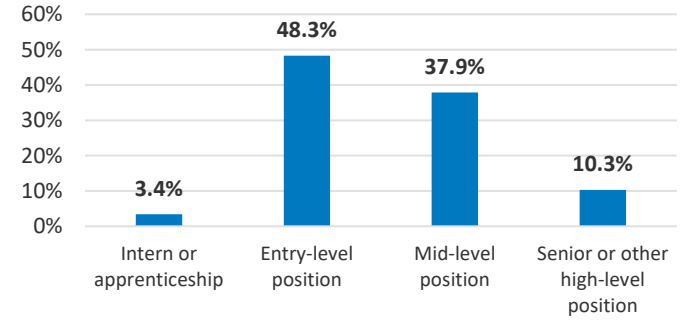
Primary Sector of Work in the Wind Industry (n=29)



Area of Study (n=29)



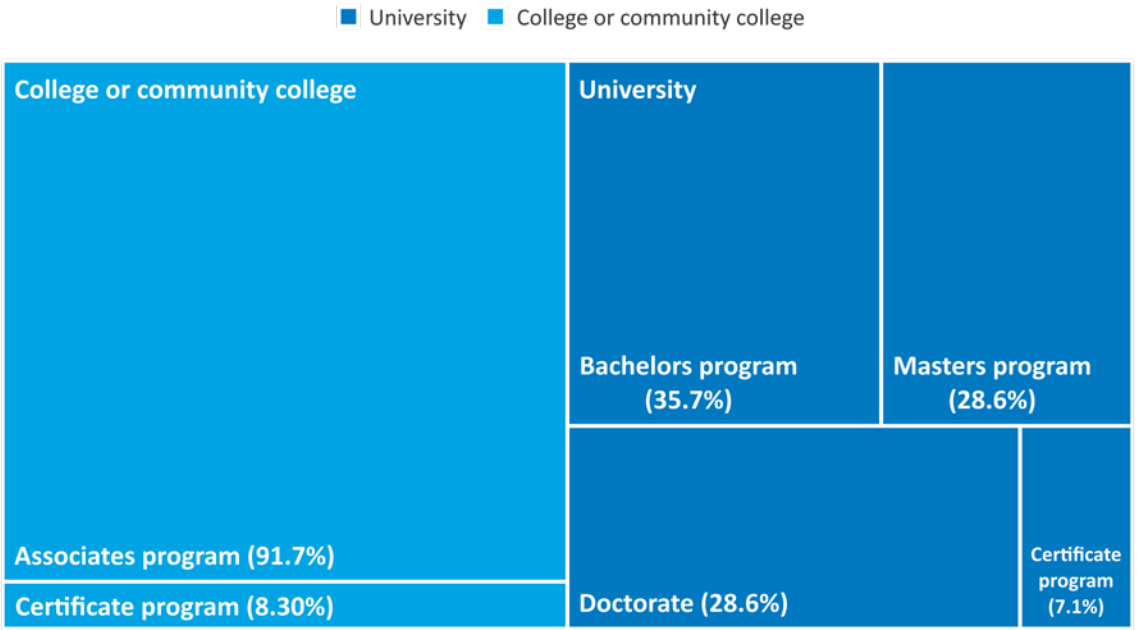
Most Recent Employment Level in the Wind Industry (n=29)



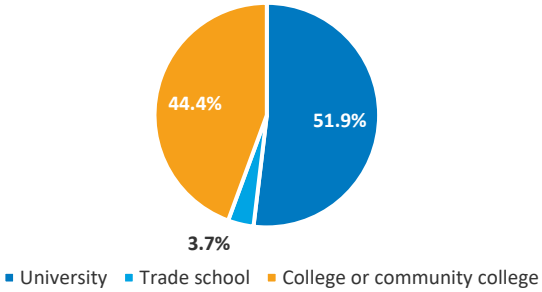
Who Took the Survey?

Educator Survey (n=27)

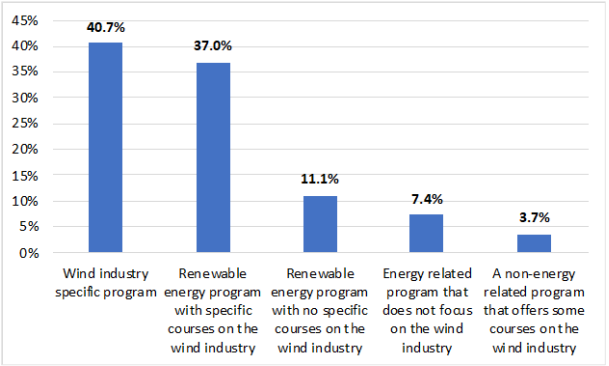
Type of Program in the School Employed (n=14, n=12)



Type of School Currently Employed (n=27)



Program Involvement With the Wind Industry (n=27)



Key Takeaways

Workforce Estimation

According to model projections under a BAU scenario, if the wind energy industry is to progress in line with the NREL 2022 Standards Scenario Midcase with nascent technology and current policy—one potential path for expansion—a larger supply of qualified and adequately trained workers will be needed to support overall workforce demand.

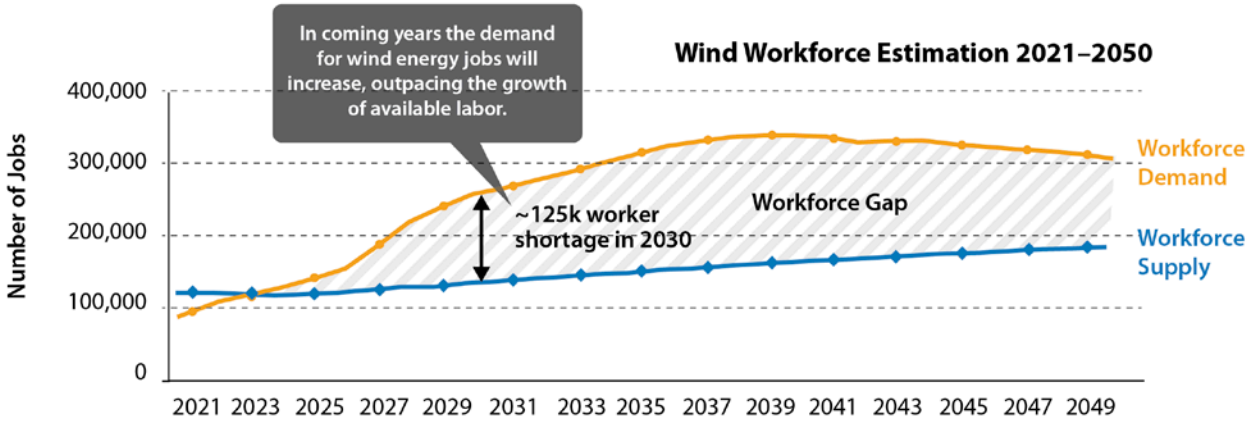


Image created by John Frenzl, NREL

2030: 134,364 FTE Supply

2030: 124,095 FTE Deficit

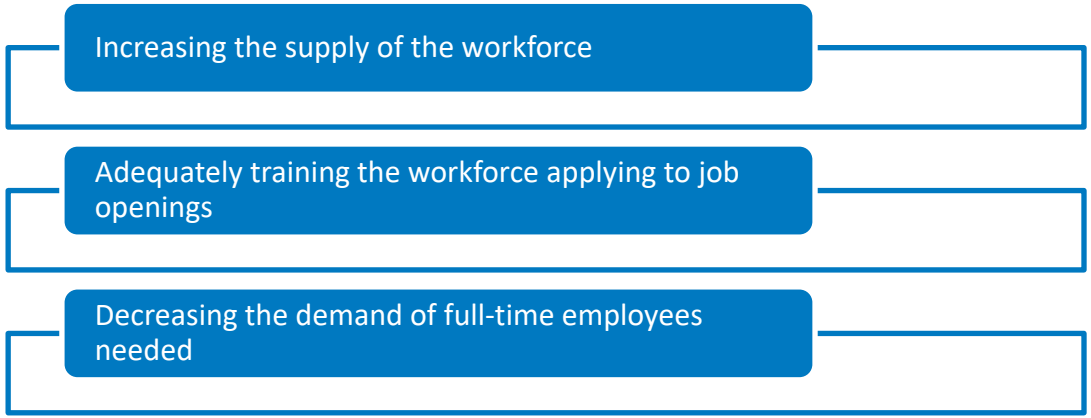
2030: 258,459 FTE Demand

Under current assumptions, the wind industry supply is expected to increase steadily through 2050; however, it is not predicted to be at the rate needed to meet 2030 or 2050 wind workforce demand. The workforce supply estimations are informed by current wind industry perceptions and baseline data collected through the 2022 survey effort, and results vary depending on the qualitative inputs.

Note: Information about the assumptions and data used is in the methodology report. These projections are highly dependent on the assumption of the model and data gathered through the 2022 survey effort and should be used as a high-level estimate of scale and trend as opposed to a point projection.

Key Takeaways

Closing the gap between the workforce needed to meet deployment goals and the supply that is possible in the wind workforce under current assumptions will require…



This presentation will address increasing the supply of the workforce through **assessing the perceptions students have of the wind industry and hiring difficulties faced by both students and wind energy firms.**

Key Takeaways

Reported perception of the wind industry from the potential workforce:

- Overall, a job in the wind energy industry is seen as having **more positive attributes** than a job in comparable industries.
- **Strengths** for wind are seen in **job stability** and opportunity to perform work that fits with people's **environmental priorities**.
- Perceived **weaknesses** for the wind industry included **job location and, to a lesser extent, entry-level wages**.
- Generally, **interest for a career in wind is high**; however, people **who are not applying to the wind industry** report the following reasons:
  - **Interest in other careers**
  - **A lack of awareness of wind industry opportunities**
  - **Limited exposure to wind curriculum in classes.**

Reported hiring challenges for wind industry firms:

- Overall, wind industry firms reported that the **largest challenge** for hiring **entry-level employees** is a **lack of experience**, whereas the **largest challenges** for **nonentry-level employees** is the **lack of applicants** to open job postings.
- **Small firms (1–9 employees) and offshore wind firms** need people with more **experience.** Conversely, **medium and large firms (10–50+ employees) and land-based wind firms** need more **applicants**.
- **Development and siting** had the **highest reported difficulty** hiring **nonentry-level employees**, and **manufacturing** had the **highest reported difficulty** for hiring **entry-level employees**.
- **Offshore wind firms had the greatest reported challenge with hiring** compared to companies that work in land-based wind or both land-based and offshore wind.
- There is also reported **difficulty hiring specific demographic groups despite wind industry firms having reported initiatives for hiring.** More data collection and program development must occur in the diversity, equity, and inclusion (DEI) space for the wind energy industry.

Reported hiring challenges for potential job seekers:

- Hiring difficulties for students and recent graduates is still being reported as a prevalent issue with the **offshore wind industry sector being reported as the most challenging sector of the wind industry to get hired into**.
- **Getting technical hands-on training** is reported as the **top challenge** for all current students and recent graduates in 2-year and 4-year degree programs.
- When divided by sector, students and recent graduates reported **that land-based wind and other renewables jobs** were challenging to find **at or where they wanted to live**. Finding the **free time to focus on career goals and getting hands-on training** were reported as the top challenges for students and recent graduates **searching for employment in offshore wind**.

Perception of the Wind Industry: Potential Workforce

Educators reported that less than half of their students who have jobs after 6 months go into the wind industry. In addition, 37.5% of students reported that they have never considered working in the wind industry.

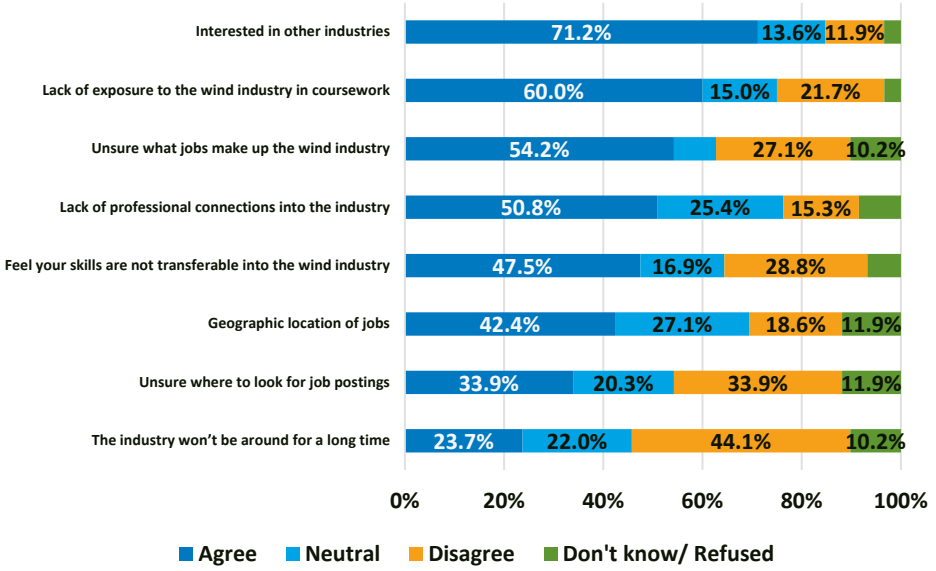
Educators reported that 89.19% of students had jobs 6 months after graduating. Further, educators reported that 47.95% of students with jobs after 6 months had these jobs within the wind industry.

Of students and recent graduate respondents, 37.5% have **not considered** working in the wind energy industry, 24.4% have **actively searched** for work opportunities, and 33.8% have **considered but not actively searched** for wind industry employment.

Top Three Reported Reasons for Lack of Consideration of Employment in Wind Energy

1) Interest in other industries (71.2%)
2) Lack of exposure to the wind industry in coursework (60.0%)
3) Unsure what jobs make up the wind industry (54.2%)

Reasons for Lack of Consideration of Employment in Wind Energy, 2022 (n = 33–60). *Graph courtesy of BW Research Partnership*

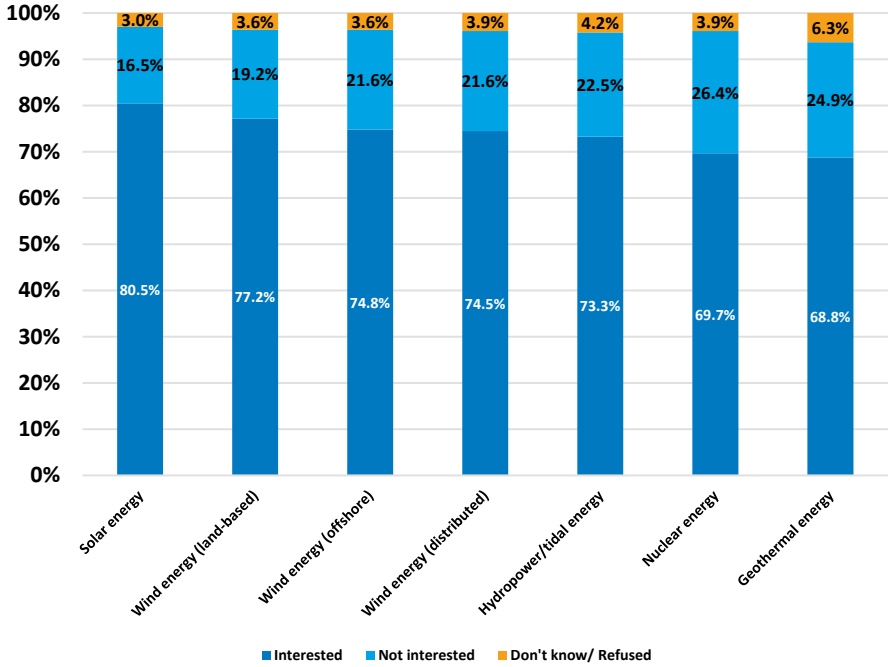


The majority of student and recent graduate respondents expressed interest in clean energy careers. Solar energy had the most interest (80.5%), followed by land-based wind (77.2%). When asked to compare wind energy employment attributes to other comparable industries, wind's overall benefits packages for employees were reported to be better than average more often than for nonwind industries.

Interest in and Perception of the Wind Industry Compared to Other Industries

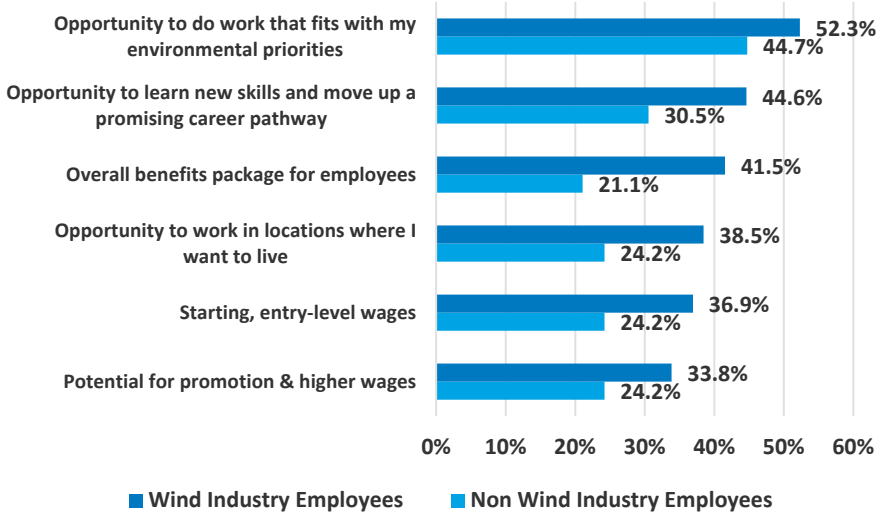
Interest in Energy Industry by Category 2022 (n = 333)

Graph Courtesy of BW Research Partnership



Better Than Average Perception of Wind Energy Industry Employment Attributes as Reported by Wind Industry and Nonwind Industry Employees, 2022 (n = 255)

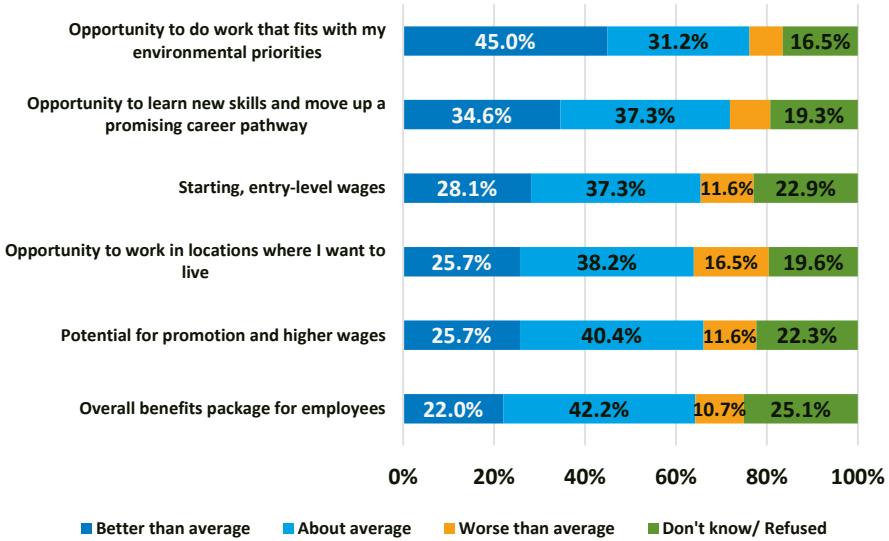
Graph Courtesy of BW Research Partnership



Job stability and the ability to do work that fits with environmental priorities were reported as strengths for the wind industry. The opportunity to work in a location where students want to work was reported as the largest weakness for the wind industry.

Perception of Wind Energy Industry Employment Attributes, 2022 (n = 327)

Graph Courtesy of BW Research Partnership

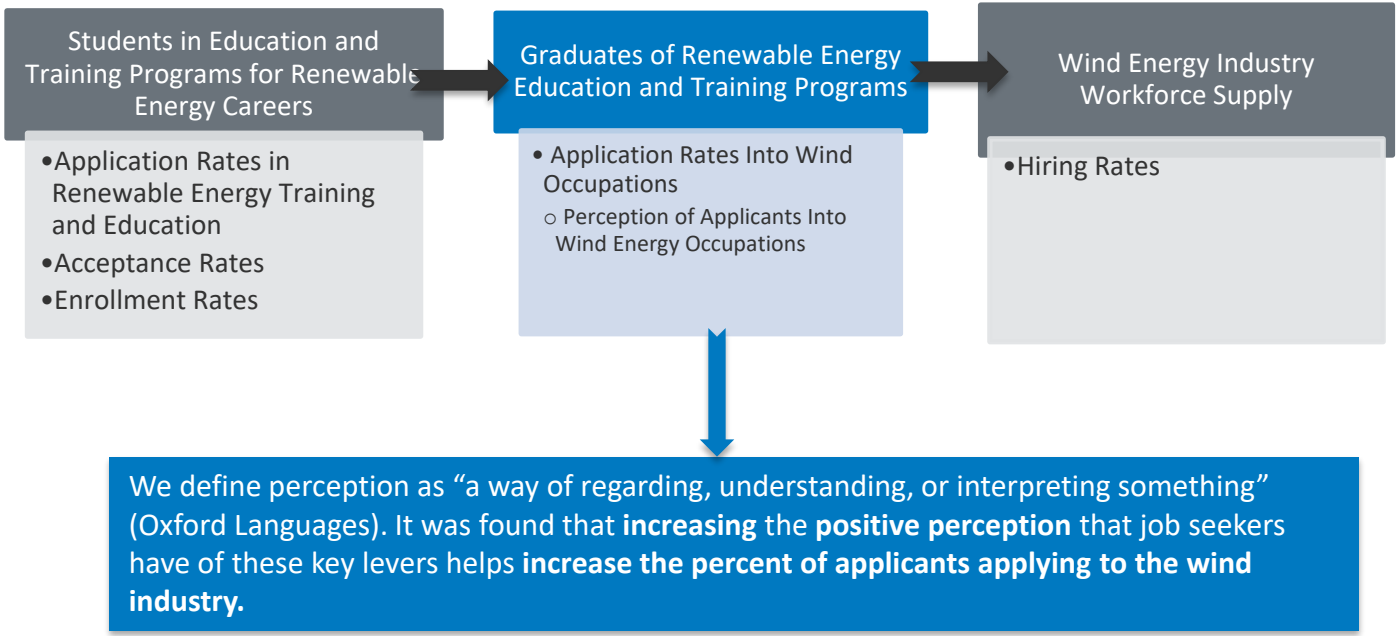


45% of respondents perceived that employment in the wind industry was **better than average** for providing the opportunity to do **work that fits with their environmental priorities**.

16.5% of respondents perceived that employment in the wind industry was **worse than average** for providing the opportunity to **work in locations where they want to live.**

81% of students or recent graduates who work in wind reported that they felt they had **stability** in their job.

To better understand how the perception of the wind industry affects application rates into wind occupations, key levers discovered through the survey effort were implemented into the workforce estimation model. Key levers that affect the perception people have of the wind industry and therefore the application rates into wind occupations included labor wages, job stability, and job location.

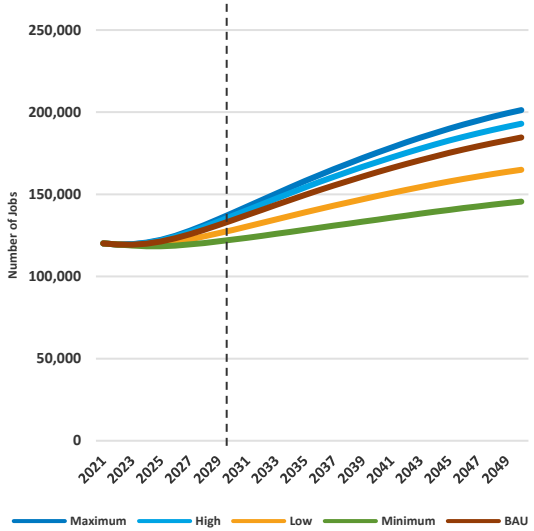


The authors ran a scenario evaluate how positively or negatively changing the perception that people trying to enter the wind workforce have affects the percent of people applying to the wind industry. The effects of these changes on the workforce supply and workforce gap can be found on **Slide 22**.

Workforce Estimation

If demand of the wind workforce stays constant to deployment estimations, increasing the number of applicants to wind industry jobs—and therefore the number of industry employees—can help mitigate the gap between demand of workers needed to meet deployment projections and supply of workers available in the wind industry. According to the model, the percent by which the workforce gap closes will be correlated to how much the positive perception of the wind industry increases or decreases. Potential ranges are displayed here but are highly dependent on taking actions to make student perceptions of labor wages, location of jobs, and job stability more positive. Because of the general positive perception and attractiveness of the wind industry as indicated in the survey effort, decreasing the perception of the wind industry causes a greater decrease from BAU than increasing the perception.

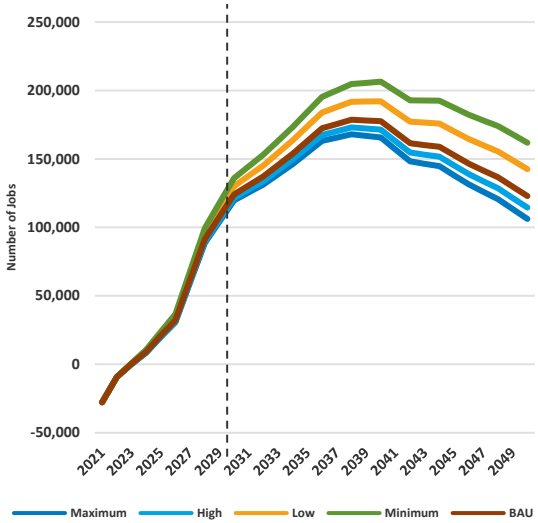
Workforce Supply Estimation: Perception Scenario



Maximum perception 2030: 138,700 Jobs
2030: Increase of 3.23% from BAU
2050: Increase of 9.06% from BAU

Minimum perception 2030: 122,422 Jobs
2030: Decrease of 8.89% from BAU
2050: Decrease of 21.1% from BAU

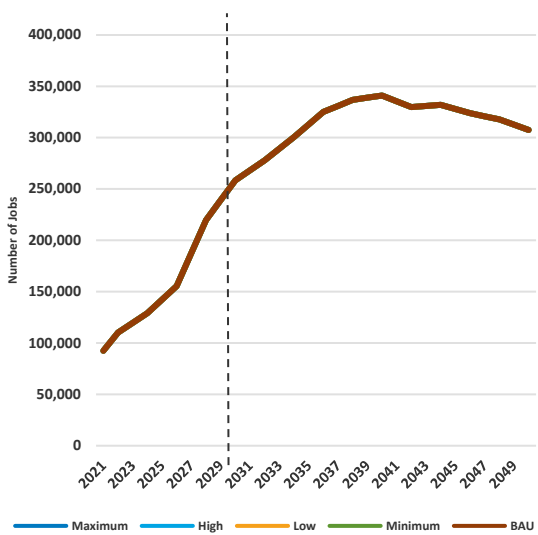
Workforce Gap Estimation: Perception Scenario



Maximum perception 2030: deficit of 119,759 Jobs
2030: Decrease of 3.49% from BAU
2050: Decrease of 13.6% from BAU

Minimum perception 2030: deficit of 136,038 Jobs
2030: Increase of 9.62% from BAU
2050: Increase of 31.7% from BAU

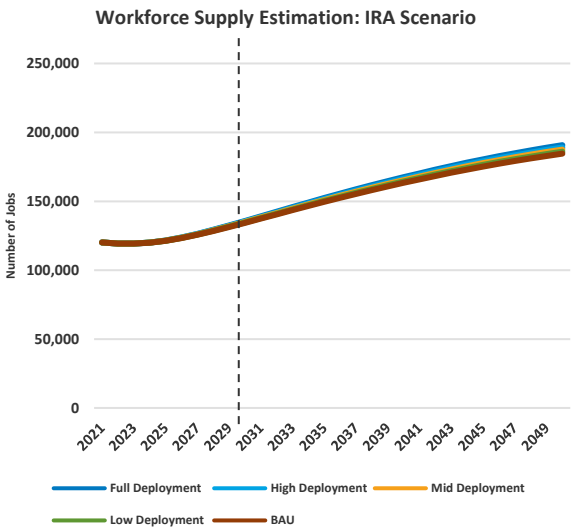
Workforce Demand Estimation: Perception Scenario



Demand stays consistent at 258,459 FTE

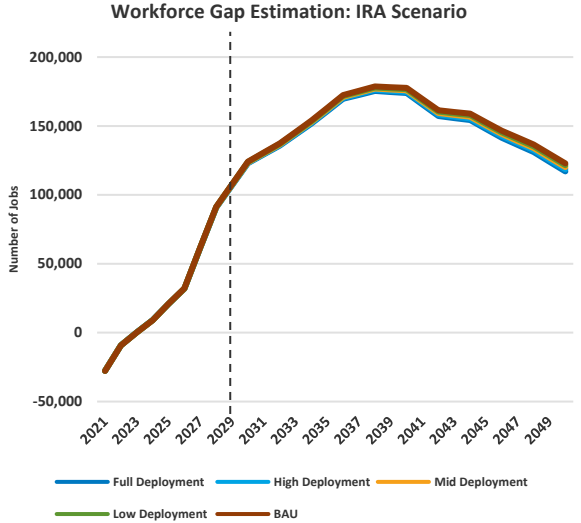
Workforce Estimation

In addition, we ran a scenario to test how the Inflation Reduction Act's (IRA's) apprenticeship requirements, prevailing wage, and domestic content incentives affect workforce estimations. The model accounts for the increased wind workforce demand caused by the IRA policy on the demand side of the model; however, many of the impacts to workforce supply will not be considered because the model assumes them to be an indirect outcome of the IRA's ability to increase workforce demand. The scenario also assumes that the IRA will not cause a decrease in the supply of the workforce as it is being implemented. This is why BAU is the lowest projection. Regarding the key levers such as apprenticeship requirements and prevailing wage utilization on the supply side of the model, it is indicated that as prevailing wage is used more, the positive perception of the wind industry—especially in related careers—will increase, therefore increasing the number of people entering the wind industry workforce.



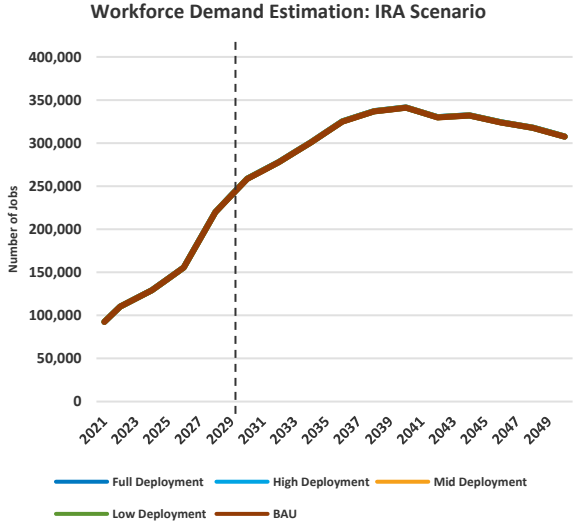
Full deployment 2030: 135,761 Jobs
2030: Increase of 1.04% from BAU
2050: Increase of 3.35% from BAU

Low deployment 2030: 134,701 Jobs
2030: Increase of 0.25% from BAU
2050: Increase of 0.77% from BAU



Full deployment 2030: deficit of 123,008 Jobs
2030: Increase of 0.88% from BAU
2050: Increase of 4.78% from BAU

Low deployment 2030: deficit of 123,837 Jobs
2030: Increase of 0.21% from BAU
2050: Increase of 1.09% from BAU



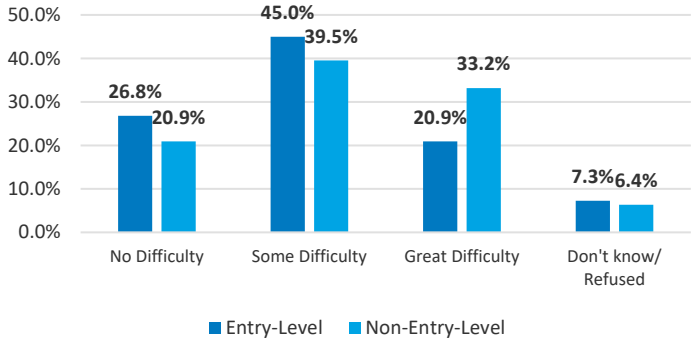
Full deployment 2030: 258,770 Jobs
2030: Increase of 0.12% from BAU
2050: Increase of 0.10% from BAU

Low deployment 2030: 258,539 Jobs
2030: Increase of 0.03% from BAU
2050: Increase of 0.03% from BAU

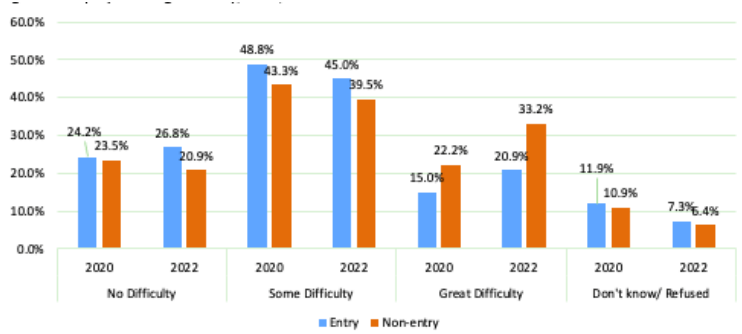
Hiring Challenges: Wind Industry

Overall difficulty for finding and hiring employees who are qualified for entry-level and nonentry-level positions at wind energy firms remains high. Employers surveyed in 2022 reported greater hiring difficulty for entry- and nonentry-level employees than in 2020.

Level of difficulty firms have in finding qualified job applicants (n = 220)



Employer Hiring Difficulty, 2020, 2022. *Graph Courtesy of BW Research Partnership*

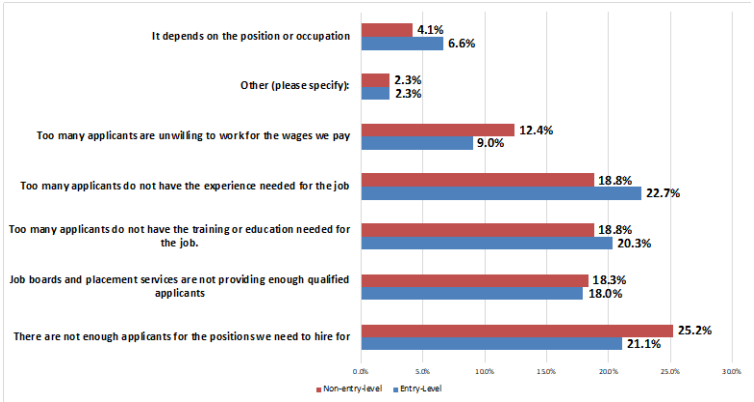


Reported Reasons for Hiring Difficulties Entry-Level vs. Nonentry-Level

*The top reason reported for hiring difficulty of entry-level workers is a **lack of experience** needed for the job.*

*The top reason reported for hiring difficulty of nonentry-level workers is a **lack of applicants** for the position.*

Reasons for Hiring Difficulty of Entry- (n = 256) and Nonentry-Level Employees (n = 218)



Note: These numbers are the sum of employer respondents who reported "some difficulty" and "great difficulty."

Employer respondents who reported their firm size to be between 10 and 49 employees indicated slightly higher levels of difficulty finding and hiring entry-level and nonentry-level employees compared to smaller (1–9 employees) and larger firms (50+ employees).

Reported Difficulty for Finding and Hiring Qualified Applicants by Firm Size (n = 220)

	Size of Firm	No Difficulty	Some Difficulty	Great Difficulty	Don't Know/Refused
Entry Level	1 to 9 employees (n = 42)	23.8%	31.0%	19.0%	26.2%
	10 to 49 employees (n = 41)	24.4%	53.7%	17.1%	4.9%
	50 or more employees (n = 137)	28.5%	46.7%	22.6%	2.2%
Nonentry Level	1 to 9 employees (n = 42)	16.7%	26.2%	31.0%	26.2%
	10 to 49 employees (n = 41)	14.6%	36.6%	46.3%	2.4%
	50 or more employees (n = 137)	24.1%	44.5%	29.9%	1.5%

- Firms that reported having 10 to 49 employees (70.8%) and firms that reported having 50 or more employees (69.3%) had **similar levels** of difficulty when hiring qualified **entry-level** candidates.
- Firms that reported having 10–49 employees (82.9%) reported **more** difficulty when finding qualified nonentry-level candidates than firms with 1–9 employees (57.2%) and firms with 50 or more employees (74.4%).
- There was a higher percent of uncertainty around hiring difficulty for firms who reported having 1–9 employees.

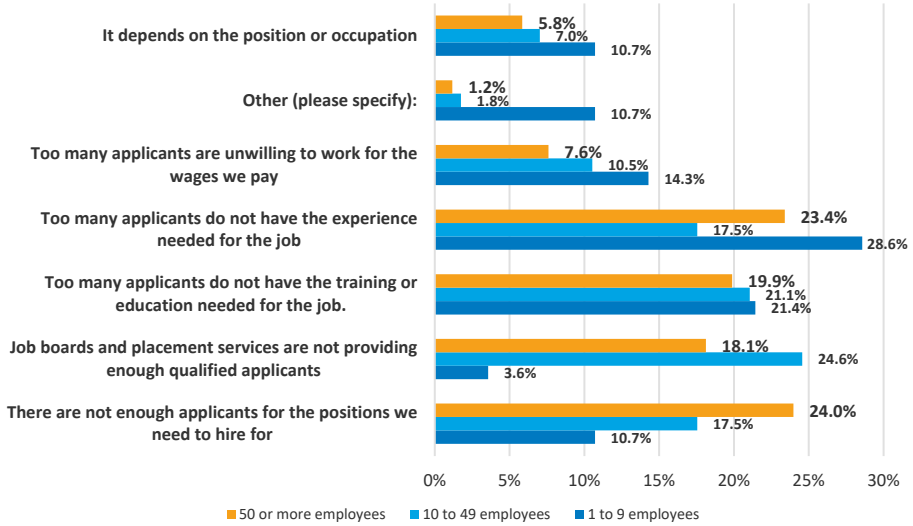
Note: These numbers are the sum of employer respondents who reported "some difficulty" and "great difficulty."

While the size of the firm did not greatly affect the overall reported hiring difficulty, the **top reasons** reported for difficulty around finding qualified applicants varied by firm size. Medium (10–49 employees) and large firms (50 or more employees) reported that there were **not enough** qualified applicants while small firms (1–9 employees) reported that the applicants did not have enough **experience for the job**.

Top Reasons Reported for Hiring Difficulty by Firm Size (Entry-Level)
50 or more employees: There are **not enough applicants** for positions.

10–49 employees: Job boards and placement services are **not providing enough** qualified applicants.

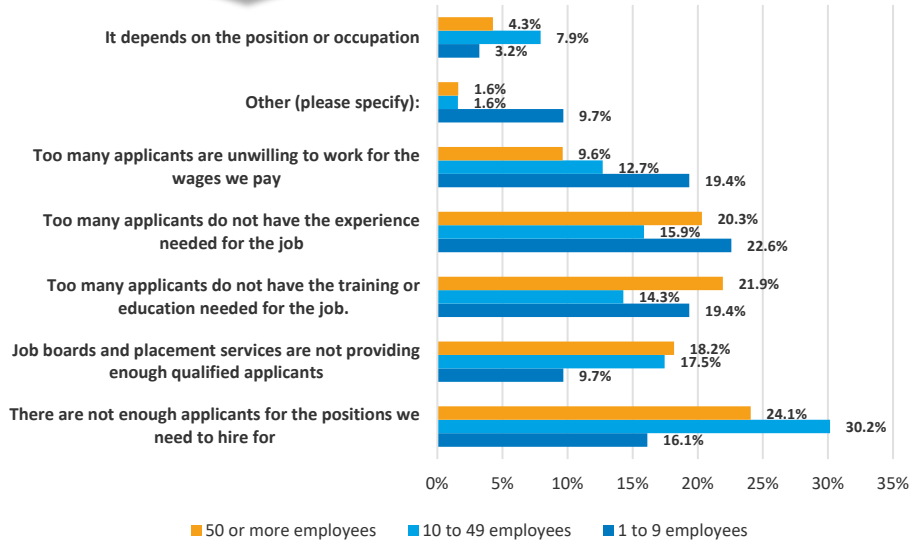
1–9 employees: Applicants do not have the **experience** needed for the job.



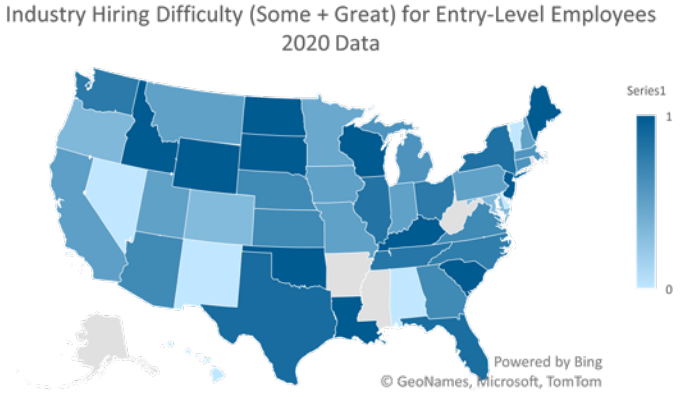
Top Reasons Reported for Hiring Difficulty by Firm Size (Nonentry-Level)
50 or more employees: There **are not enough applicants** for positions.

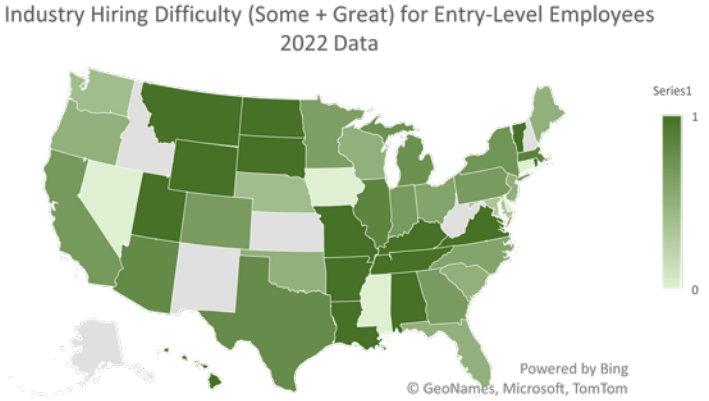
10–49 employees: There are **not enough applicants** for positions.

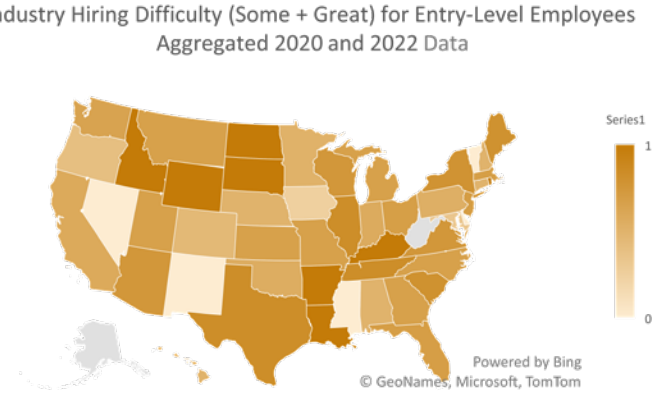
1–9 employees: Applicants do not have the **experience** needed for the job.



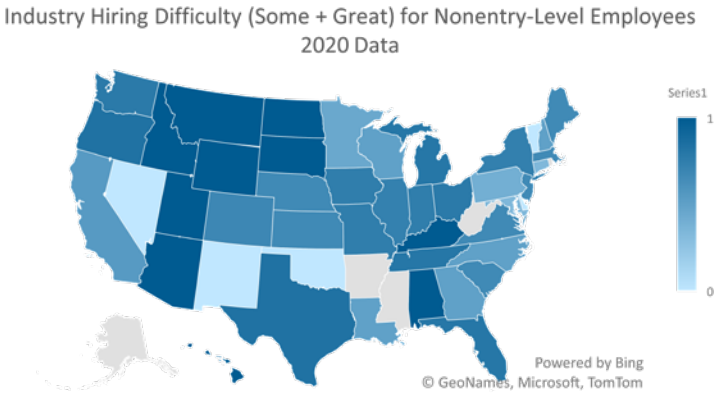
Geographic location is another factor that can affect wind industry hiring difficulty levels. In 2020 (n = 278) and 2022 (n = 218), wind industry firms reported hiring difficulty for entry-level employees across the United States. Darker shaded states indicate where industry respondents reported more hiring difficulty normalized for number of respondents.

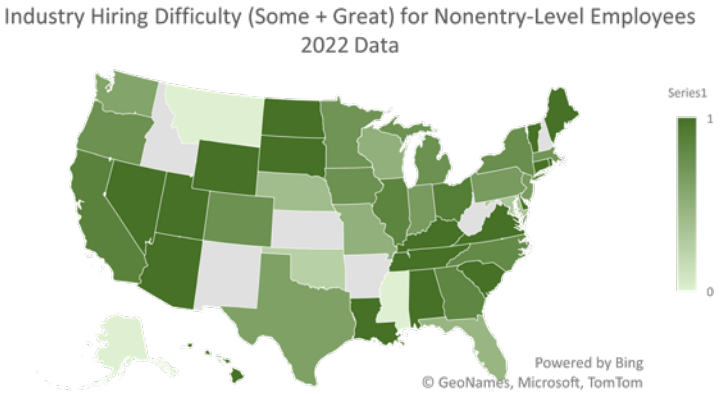


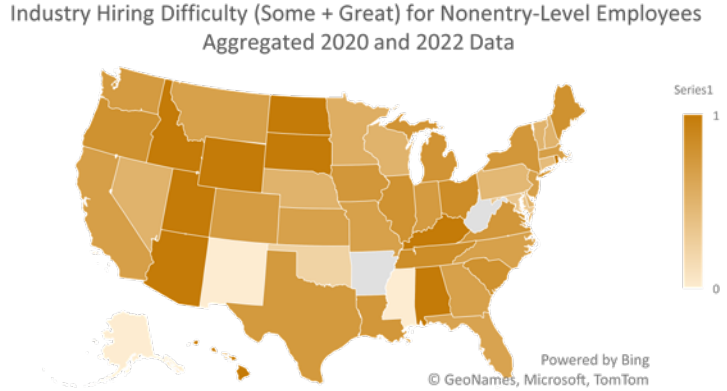




Similarly to entry-level employees, in 2020 (n =278) and 2022 (n = 217), wind industry firm respondents reported that hiring difficulty for nonentry-level employees varied across the United States. Darker shaded states indicate where industry respondents reported more hiring difficulty normalized for number of respondents.







Manufacturing had the highest reported hiring difficulty for entry-level employees (67.4%), and development and siting had the highest reported hiring difficulty for nonentry-level employees (75.4%).

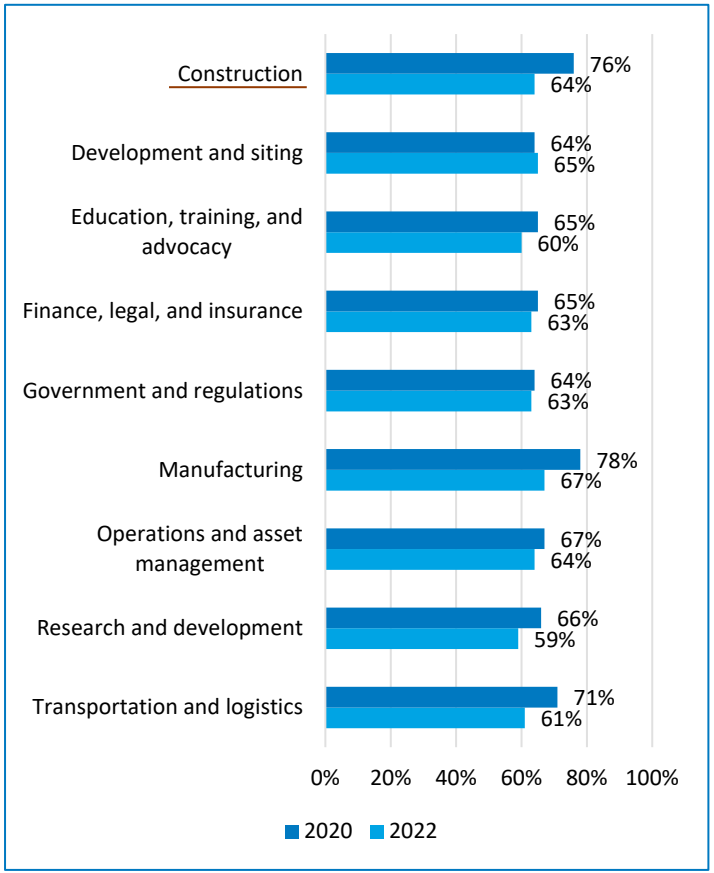
Reported Difficulty for Finding and Hiring Qualified Applicants by Value Chain Segment

Entry-Level	No Difficulty	Some Difficulty	Great Difficulty	Don't Know/Refused
Operations and Asset Management	30.1%	43.4%	20.6%	5.9%
Finance, Legal, and Insurance	33.0%	46.4%	16.5%	4.1%
Transportation and Logistics	37.5%	42.0%	19.3%	1.1%
Development and Siting	33.0%	42.0%	22.0%	3.0%
Construction	33.1%	42.3%	21.5%	3.1%
Government and Regulations	31.9%	45.1%	17.6%	5.5%
Education, Training, and Hiring	31.7%	40.7%	19.5%	8.1%
Research and Development	32.8%	41.0%	18.0%	8.2%
Manufacturing	30.4%	43.5%	23.9%	2.2%

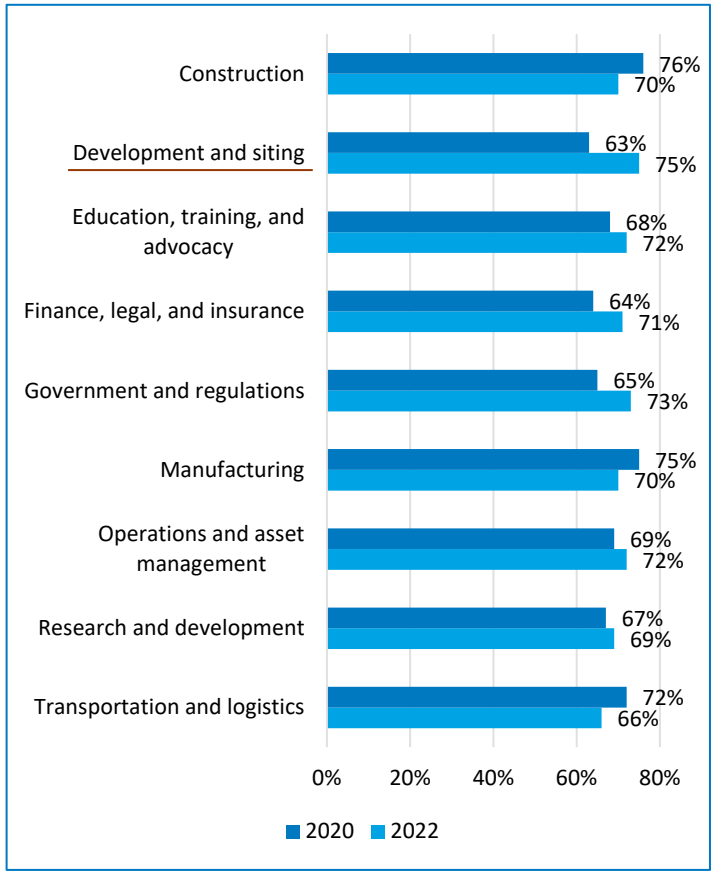
Note: The numbers above are the sum of employer respondents who reported "some difficulty" and "great difficulty."

Nonentry-Level	No Difficulty	Some Difficulty	Great Difficulty	Don't Know/Refused
Operations and Asset Management	23.5%	39.7%	32.4%	4.4%
Finance, Legal, and Insurance	25.8%	39.2%	32.0%	3.1%
Transportation and Logistics	31.8%	40.9%	25.0%	2.3%
Development and Siting	21%	41.0%	34%	4.0%
Construction	26.9%	45.4%	24.6%	3.1%
Government and Regulations	20.9%	42.9%	29.7%	6.6%
Education, Training, and Hiring	21.1%	39.0%	33.3%	6.5%
Research and Development	24.6%	41.8%	27.0%	6.6%
Manufacturing	28.3%	44.6%	25.0%	2.2%

Reported Difficulty for Finding and Hiring Qualified Applicants by Value Chain Segment



- Construction saw the greatest decrease in reported hiring difficulty for entry-level employees between 2020 and 2022.
- Development and siting saw the greatest increase in hiring difficulty for nonentry-level employees between 2020 and 2022.



Graph Courtesy of BW Research Partnership

Graph Courtesy of BW Research Partnership

Employer respondents who participate only in the offshore wind industry reported the greatest amount of hiring difficulty. This could be because of the novelty of the offshore wind industry in the United States.

Reported Difficulty for Finding and Hiring Qualified Applicants by Wind Industry Sectors

	Wind Sector	No Difficulty	Some Difficulty	Great Difficulty	Don't Know/Refused
Entry-Level	Land-Based Wind	29.0%	47.7%	15.0%	8.4%
	Offshore Wind	6.7%	40.0%	46.7%	6.7%
	Both	27.6%	42.9%	23.5%	6.1%
Nonentry-Level	Land-Based Wind	17.8%	37.4%	34.6%	10.3%
	Offshore Wind	13.3%	46.7%	40.0%	0.0%
	Both	25.5%	40.8%	30.6%	3.1%

Employer respondents who work only in offshore wind reported the greatest amount of difficulty when finding and hiring qualified entry-level (86.7%) and nonentry-level (86.7%) applicants when compared to land-based-only wind companies and companies that work in both land-based and offshore wind energy.

Note: These numbers are the sum of employer respondents who reported "some difficulty" and "great difficulty."

Reasons for hiring difficulties change based on wind industry sector. Offshore wind employers reported that there is a **lack of adequate training and education** for entry-level applicants and a **lack of experience** for nonentry-level applicants. In addition, land-based wind employers reported that there are **not enough applicants** for entry-level and nonentry-level wind positions.

Top Reasons Reported for Hiring Difficulty by Sector (Entry-Level)
Land-based wind: There are **not enough** applicants for the positions.

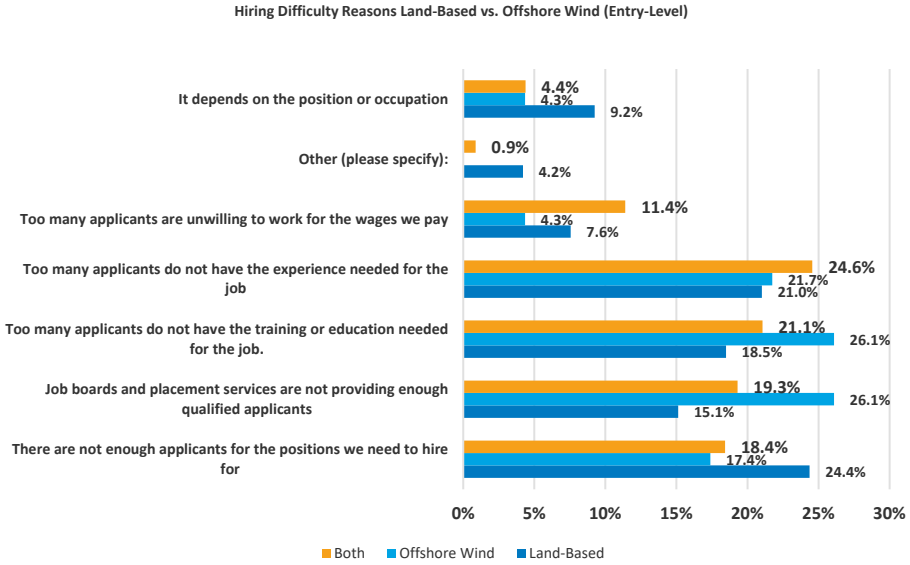
Offshore wind: There are too many applicants who **do not have** the training or education needed; job boards and placement services are **not providing enough** qualified applicants.

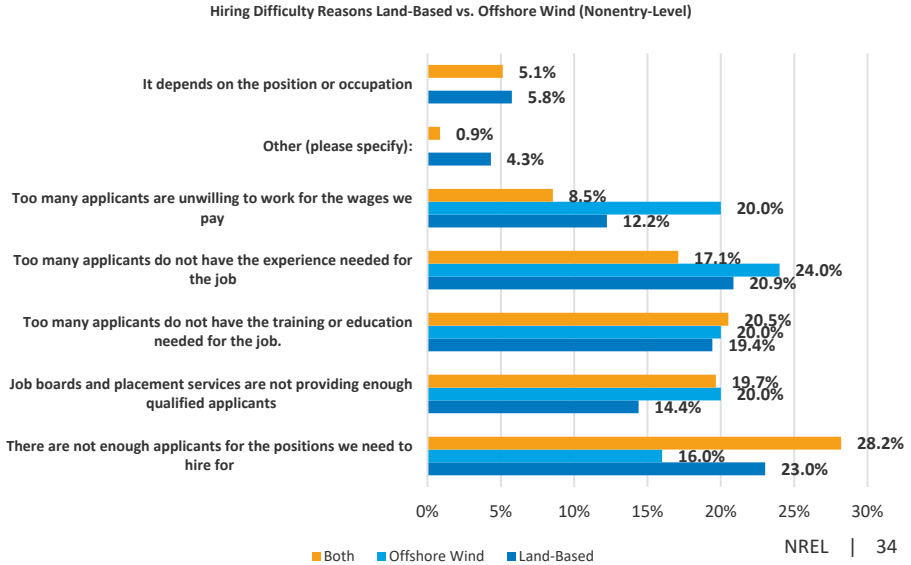
Both: Too many applicants **do not have the experience** needed for the job.

Top Reasons Reported for Hiring Difficulty by Sector (Nonentry-Level)
Land-based wind: There are **not enough** applicants for the positions.

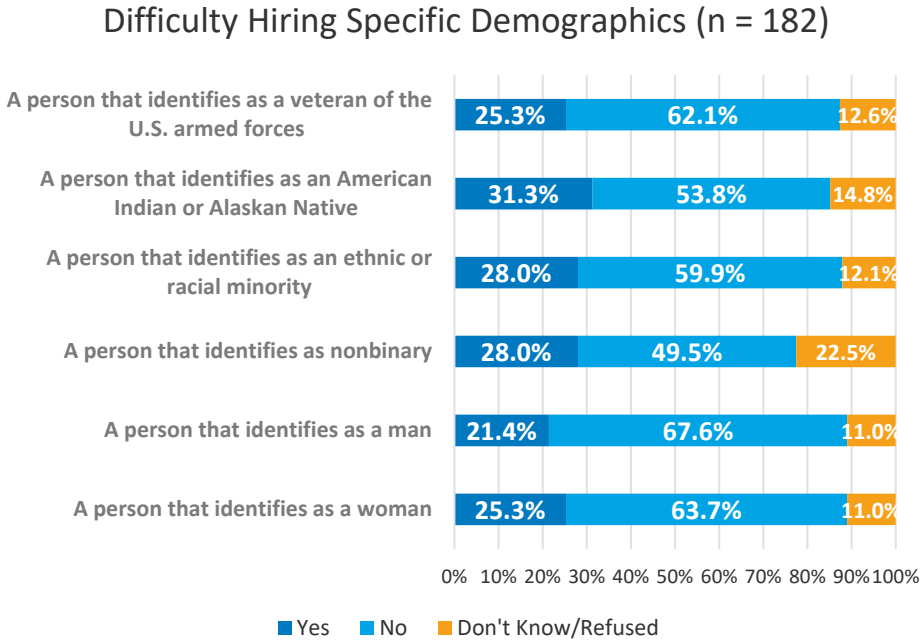
Offshore wind: Too many applicants **do not have the experience** needed for the job.

Both: There are **not enough** applicants for the positions.





Wind energy firms reported some hiring difficulty across all demographic groups. Reducing barriers into wind industry education programs and employment is essential to improving the workforce gap. While the wind workforce continues to increase, intentional inclusivity and equity practices will be needed to not only mitigate the further emergence of historical inequities but also to ensure that local benefits, such as job creation, are allocated to the community where development is occurring.

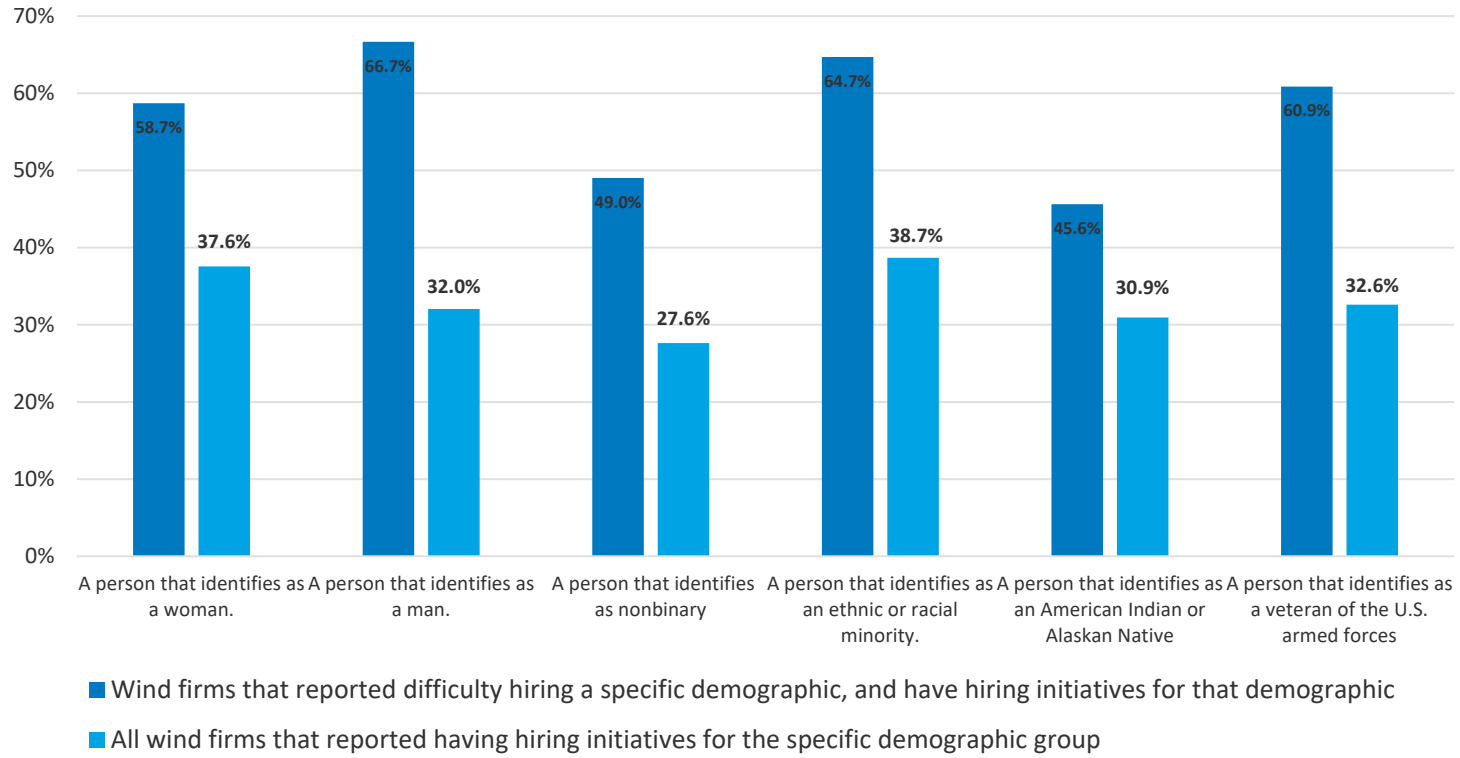


Wind firms reported the highest difficulty with hiring were people who identifies as…

1. American Indian or Alaskan Native (31.3%)
2. An ethnic or racial minority (28.0%)
3. Nonbinary (28.0%)*
4. Woman (25.3%)
5. Veteran (25.3%)

*Of the employers who responded, 22.5% were unsure or refused to answer if there was difficulty when trying to hire a person who identifies as nonbinary.

Wind energy firms that reported difficulty hiring employees of the following demographic groups reported having more initiatives and programs to increase recruitment numbers than all wind firms that reported in general. This distribution could potentially be attributed to awareness of DEI practices and tracking of metrics within the specific wind energy firms.



Hiring Challenges: Job Seekers

Over half of the surveyed students and recent graduates reported difficulty finding employment in wind and renewable energy industries other than wind.

Challenges Finding Employment Opportunities in Energy Industries (n = 224)

	Difficulty	No Difficulty	Not Applicable
Wind energy industry (offshore)	61.2%	17.0%	21.9%
Wind energy industry (distributed)	54.9%	21.4%	23.7%
Wind energy industry (land-based)	58.0%	22.3%	19.6%
Renewable energy industry other than wind	55.4%	23.7%	21.0%
Energy industry other than renewable energy (e.g., fossil fuels, nuclear power)	49.6%	23.7%	26.8%

- Students and recent graduates reported the highest percent of difficulty finding employment in offshore wind (61.2%).
- Students and recent graduates reported the lowest percent of difficulty finding employment in energy industries other than renewable energy (49.6%).

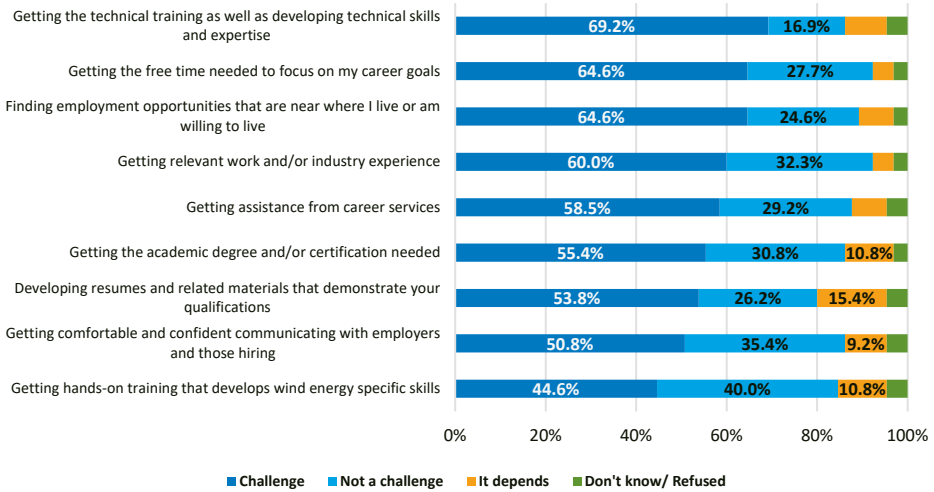
Both current and recently graduated students and current wind industry employees reported finding employment where they live or are willing to live as one of their top three reasons for hiring difficulty. Other reasons include gaining technical training, hands-on training, experience, and the free time needed to focus on career goals.

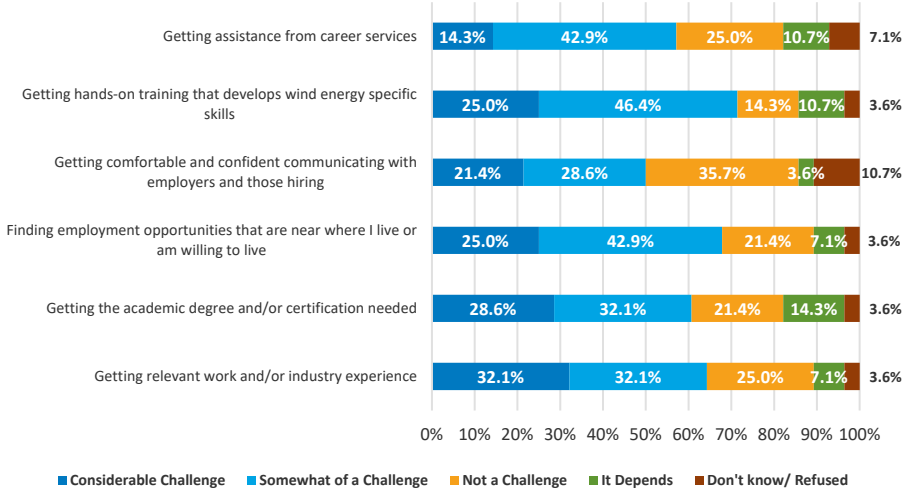
Top Three Reasons Reported for Hiring Difficulty by Students

1) Getting the **technical training** as well as developing **technical skills** and expertise
2) Getting the **free time** needed to focus on my career goals
3) Finding employment opportunities that are **near where I live or am willing to live**

Top Three Reasons Reported for Hiring Difficulty by Current Wind Employees

1) Getting **hands-on training** that develops wind-energy-specific skills
2) Finding employment opportunities that are **near where I live or am willing to live**
3) Getting relevant work and/or industry **experience**





Students and recent graduates who attended 2- and 4-year degree programs reported that getting technical training was their top challenge when trying to find employment in the wind industry. Getting free time to focus on career goals and relevant experience were also reported as challenges by both. Four-year degree program students reported finding employment where they live or are willing to live and getting assistance from career services as challenges to finding employment in the wind industry.

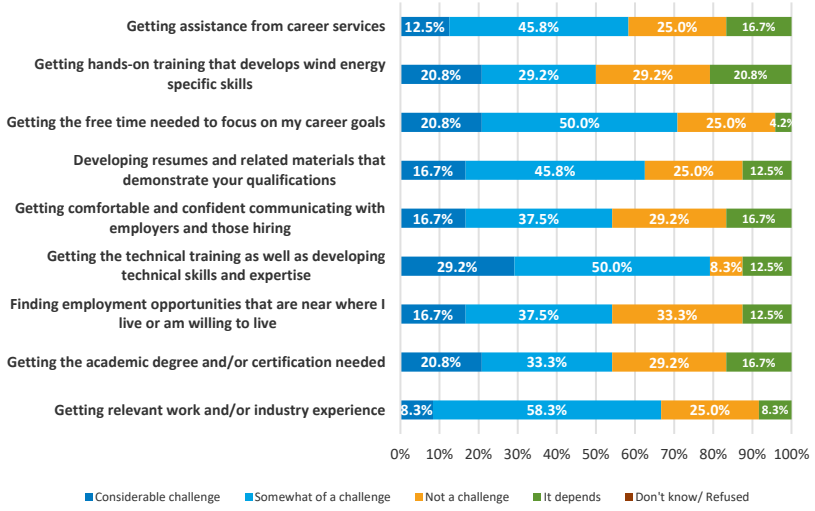
Top Three Reasons Reported for Hiring Difficulty by 2-Year-Degree Program Students

1) Getting the **technical training** as well as developing technical skills and expertise
2) Getting the **free time** needed to focus on career goals
3) Getting relevant work and/or industry **experience**

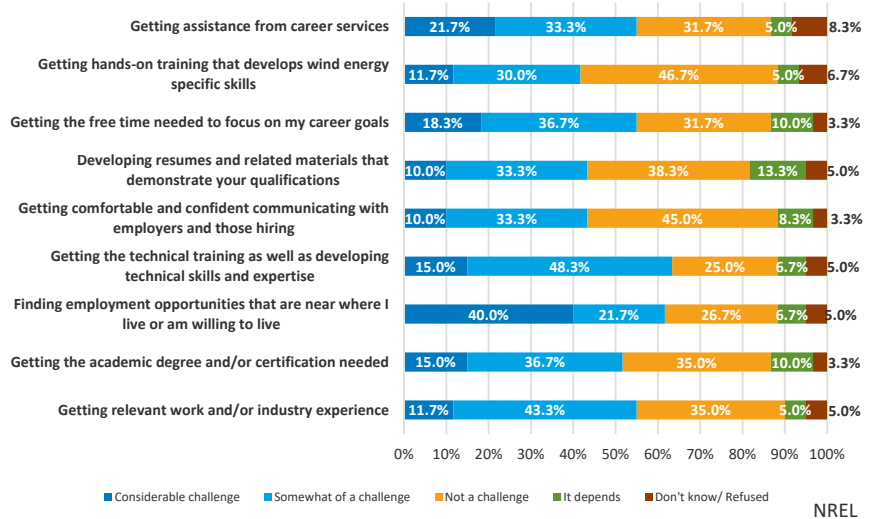
Top Reasons Reported for Hiring Difficulty by 4-Year-Degree Program Students

1) Getting the **technical training** as well as developing technical skills and expertise
2) Finding employment opportunities that are near **where I live or am willing to work**
3) Tie for getting **experience, free time, and assistance from career services**

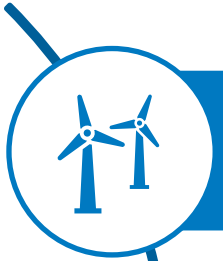
Wind Industry Hiring Challenges: 2-Year Certification or Degree Program Students



Wind Industry Hiring Challenges: 4-Year Certification or Degree Program Students



Top challenges to finding work in the wind industry reported by students who are currently working in land-based wind, offshore wind, and renewable energy other than wind.



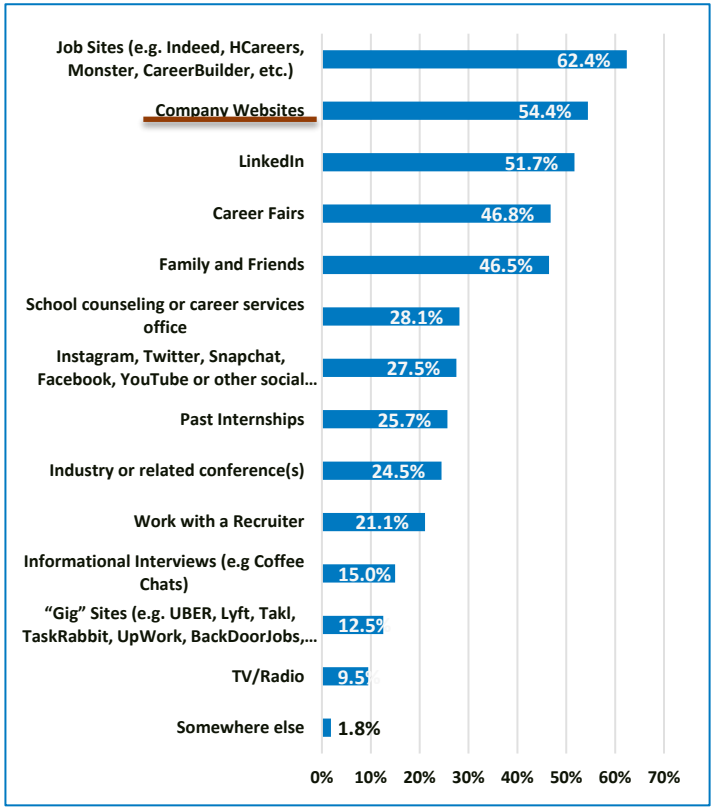
Land-Based Wind: Finding employment opportunities that are near where I live or am willing to live (60%); getting the free time needed to focus on my career goals (60%)

Offshore Wind: Getting the free time needed to focus on my career goals (63.6%); getting hands-on training that develops wind-energy-specific skills (63.6%)

Renewables Other Than Wind: Finding employment opportunities that are near where I live or am willing to live (75%); getting hands-on training that develops wind-energy-specific skills (75%)

There is also a reported disconnect between where students search for jobs and where industry employers look for applicants.

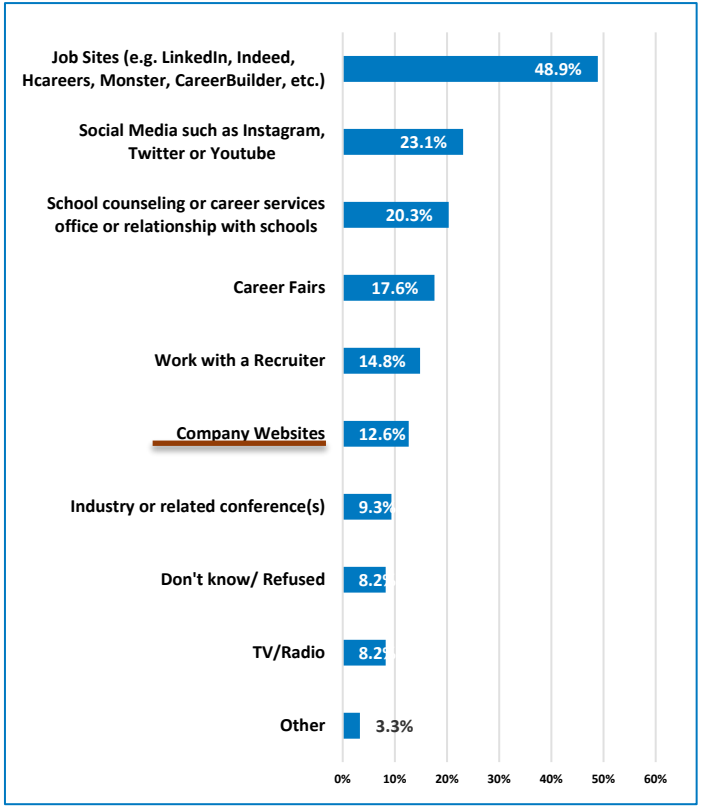
Students



Graph Courtesy of BW Research Partnership

- Job sites were most used for finding applicants by wind firms (48.9%) and finding jobs by students and recent graduates (62.4%).
- Misalignment could prevent students from connecting with industry for job opportunities (e.g., company websites).

Industry Employers



Graph Courtesy of BW Research Partnership

Potential Actions for Industry and Education/Training Programs To Better Connect With Qualified Students

More information can be found in the *Connective Actions for Educator & Wind Industry* presentation

Actionable Steps To Address Workforce Gap

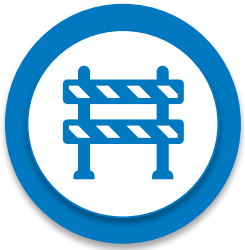
Lack of Experience…

Collaborate With Education Institutions To Build Awareness of Wind Industry Opportunities

Establish Effective Internship and Apprenticeship Programs and Pipelines

Lack of Applicants…

Connect With Students Through Outreach and Programs Like Collegiate Wind Competition



Reduce Barriers to Entrance for Historically Underrepresented Populations

More information can be found in the *Connective Actions for Educator & Wind Industry* presentation

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Thank You

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