

Growing a Wind Workforce: The National Wind Energy Skills Assessment Report

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A robust workforce is essential to grow high-quality domestic wind industry capabilities. The purpose of this research is to better understand today's domestic wind workforce, projected needs for the future, and how existing and new education and training programs can meet future wind workforce needs.

Introduction

Results presented in this report provide the first published investigation into the detailed makeup of the wind energy workforce as well as a glance at the educational infrastructure and training needs of the wind industry. Insights from this research into the domestic wind workforce allow the private sector, educational institutions, and federal and state governments to make better informed workforce-related decisions based on the current data and future projections.

The research had five components:

- 1) Conduct a wind industry employer survey
- 2) Compile an evolving catalog of wind-specific education and training programs
- 3) Correlate employer preferences with available education and training programs
- 4) Project new hires needed in the wind workforce to account for growth needed for the 20% Wind by 2030 scenario
- 5) Estimate the number of graduates needed by program type (e.g., graduate-level course, community college degree).

The Wind Industry Employer Survey

- NREL subcontracted with BW Research for the survey.
- NREL's wind employer online and phone survey began in August 2012.
- The utility-scale wind sample included 418 companies.

Results: Importance of Wind-Specific Degree

Job Type	College Degree	Wind Energy-Specific College Degree	Ratio of Importance of Wind Energy-Specific College Degree vs. Degree Not Specific to Wind
Assembly workers	29%	29%	100%
Wind technicians	40%	40%	100%
Development technical specialists	84%	47%	56%
Research engineers	97%	48%	50%
Professors & teachers	100%	47%	47%
Trade workers	19%	7%	38%
Engineers	100%	36%	36%
Development managers	94%	28%	30%
Resource assessors & surveyors	88%	24%	27%
Managers of sales, operations, & training	95%	24%	25%
Transportation/logistics workers	53%	13%	25%
Land-leasing agents	62%	15%	25%
Professional trainers	91%	22%	24%
Construction managers	77%	18%	24%
Scientists	100%	20%	20%
Paralegals	100%	17%	17%
Product designers	93%	15%	16%
Manufacturing salespeople	86%	11%	13%
Admin/clerical	61%	8%	13%
Manufacturing managers	80%	10%	13%
O&M accountants & bookkeepers	93%	7%	8%
Supply chain & purchasing managers	79%	6%	7%
Attorneys	100%	7%	7%
Development finance	85%	5%	6%
Construction laborers	9%	0%	0%
Government regulatory workers	100%	0%	0%



Photo by Dennis Schroeder, NREL 21958

Wind Workforce Projection Method

- Used primary survey data to assess current employment
- Anchored employment results to 20% Wind Energy by 2030 report (U.S. Department of Energy 2008), which estimated industry growth rates.
 - Anchored O&M jobs to cumulative installed capacity
 - Anchored construction and development jobs to annual installed capacity.
- **Built in:**
 - Retirement rates
 - Labor efficiency gains.

Results: One Segment of Jobs in Today's Wind Industry

Subset of the Workforce Captured in Our Survey (~46,000 Workers)

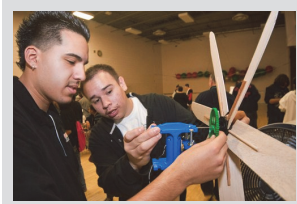
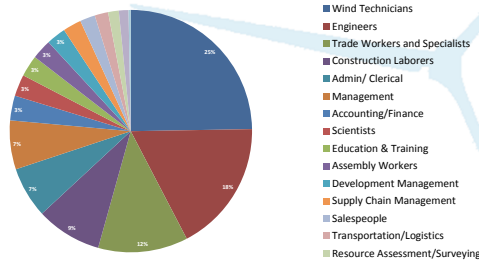


Photo by Pat Corkery, NREL 17128



Photo from Northern Power Systems, NREL 13853

Results: Level of Difficulty in Finding Qualified Applicants by Occupation

Occupation	Some or Great Difficulty
Professors & teachers	84%
Product designers	75%
Trade workers	71%
Manufacturing salespeople	64%
Wind technicians	79%
Construction managers	72%
Professional trainers	77%
Development technical specialists	74%
Engineers	66%
Scientists	71%
Research engineers	69%
Managers of sales, operations, and training	61%
Attorneys	44%
Transportation/logistics workers	41%
Land-leasing agents	46%
Development managers	52%
Paralegals	44%
Supply chain & purchasing managers	54%
Construction laborers	73%
Resource assessors & surveyors	44%
Development finance	40%
Admin/clerical	35%
Manufacturing managers	74%
Government regulatory workers	73%
O&M accountants & bookkeepers	60%
Assembly workers	67%

Responses greater than 70% for the sum of "Some or Great Difficulty" are highlighted in green.

The seven occupations highlighted in blue are those exceeding the threshold on both 25% "Great Difficulty" and 70% "Some Difficulty" or "Great Difficulty."

Results: Final Estimate of Education & Training Gap

To meet predicted wind industry growth over the next 20 years, we need to increase the number of **wind-energy-specific** education and training programs offered at the community college and university levels.

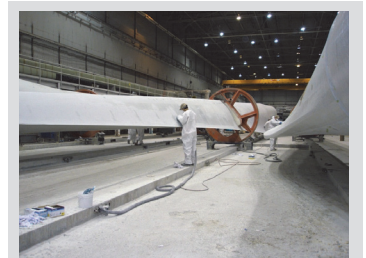


Photo from Gamesa, NREL 16001

Degree/Certificate	Maximum New Hires Needed with Wind-Specific Degrees/Certificates	Type of Institution Offering	Estimated Percent of Graduates Entering Wind Industry	Number Needed to Graduate in Max Year	Estimated Graduates Per Program Per Year	Number of Programs Needed in United States	Number of Programs Currently Available	Difference
Post-secondary professional certificate (journeyman, trade/technical programs)	2,750	Community & tech colleges	83%	3,310	21	160	70	90
Associate's degree	1,000	Community & tech colleges		1,200		60	90	0
Bachelor's degree	800	University	48%	1,660	34	50	20	30
Post-bachelor's professional certification (e.g., CPA, PE, LEED)	210	University		440		10	NA	0-10
Master's degree, Ph.D., or Law	550	University		1,150		30	20	10

Source: A National Skills Assessment of the U.S. Wind Industry in 2012

Michael Leventhal and Suzanne Tegen, NREL 2013

www.nrel.gov/docs/fy13osti/57512.pdf