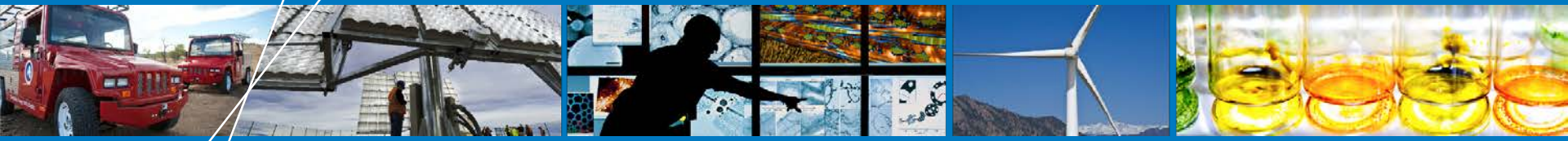
NREL
NATIONAL RENEWABLE ENERGY LABORATORY

The National Wind Energy Skills Assessment & Preparing for the Future Wind Workforce



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North American Wind Energy Academy Symposium

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Background

A robust workforce is essential to growing domestic wind manufacturing 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 needs.

Our literature review showed that a U.S. wind workforce assessment has not been performed on a national scale. Our research, report, career map, and other projects contribute to workforce knowledge, including education and training.


Photo by David Parsons, NREL 05572


Photo by Dennis Schroeder, NREL 21958


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Research Method

For this research, we:

1. **Surveyed the current wind-focused education and training programs at American colleges and universities**
2. **Determined which jobs are in the wind industry today and what type of training employers prefer**
3. **Estimated the need for new or expanded wind-focused education and training programs to reach future goals.**

Two Projects in One

Education and Training Database

Community college outreach

University outreach

- Number of current students
- Number of graduates
- Percentage in the wind industry.

Industry Survey

A survey of more than 400 wind industry companies

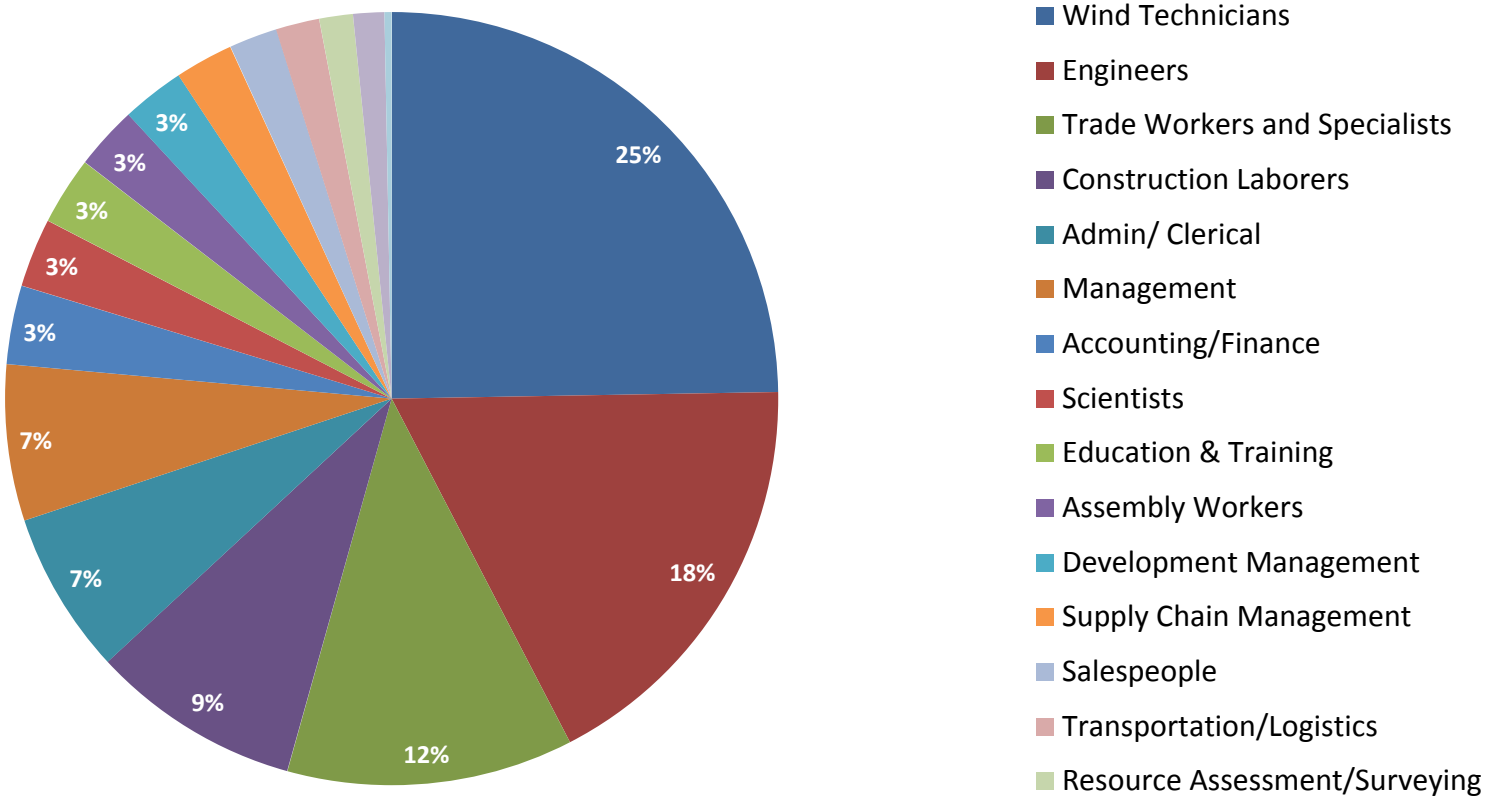
- Number of workers
- Categories of jobs
- Employee skills
- Employee training.

National Wind Energy Skills Assessment Analysis and Report

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

Subset of the Workforce Captured in Our Survey

(~46,000 of ~80,000 Workers)



Manufacturing jobs include some from the following categories: trade workers, assembly workers, supply chain management, salespeople, transportation, and some admin/ clerical—approximately 25%.

Wind Workforce Projection

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

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.

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 US	Number of Programs 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**

Summary: We Need a Qualified Workforce

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.

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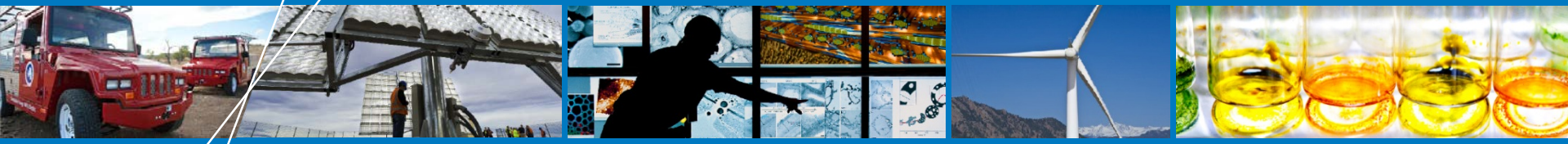


In addition to the workforce research, DOE/NREL have wind workforce-related projects.

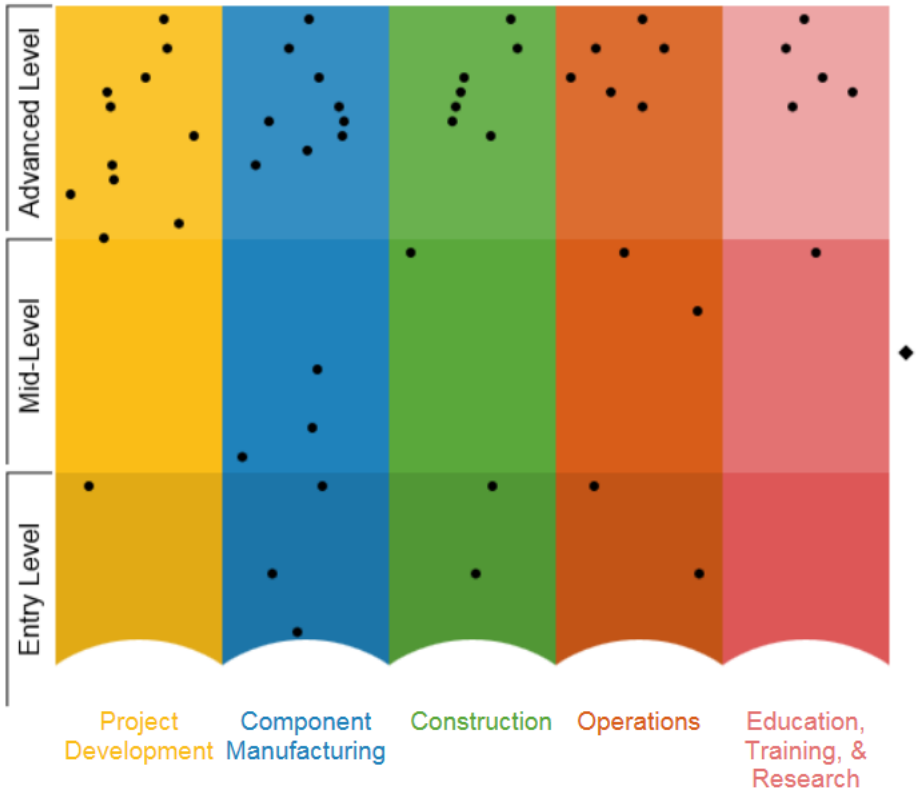
Wind Workforce – Wind Career Map

WIND CAREER MAP

- Wind Program Home
- About the Program
- Research & Development
- WINDExchange
- Financial Opportunities
- Information Resources
- News
- Events

This wind career map explores an expanding universe of wind energy occupations, describing diverse jobs across the industry, charting possible progression between them, and identifying the high-quality training necessary to do them well.

About this Mapping Tool



Wind Jobs

Mouse over the career map at the left to explore wind industry related jobs in Project Development; Component Manufacturing; Construction; Operations; and Education, Training, & Research. Or select a multi-sector career route below.

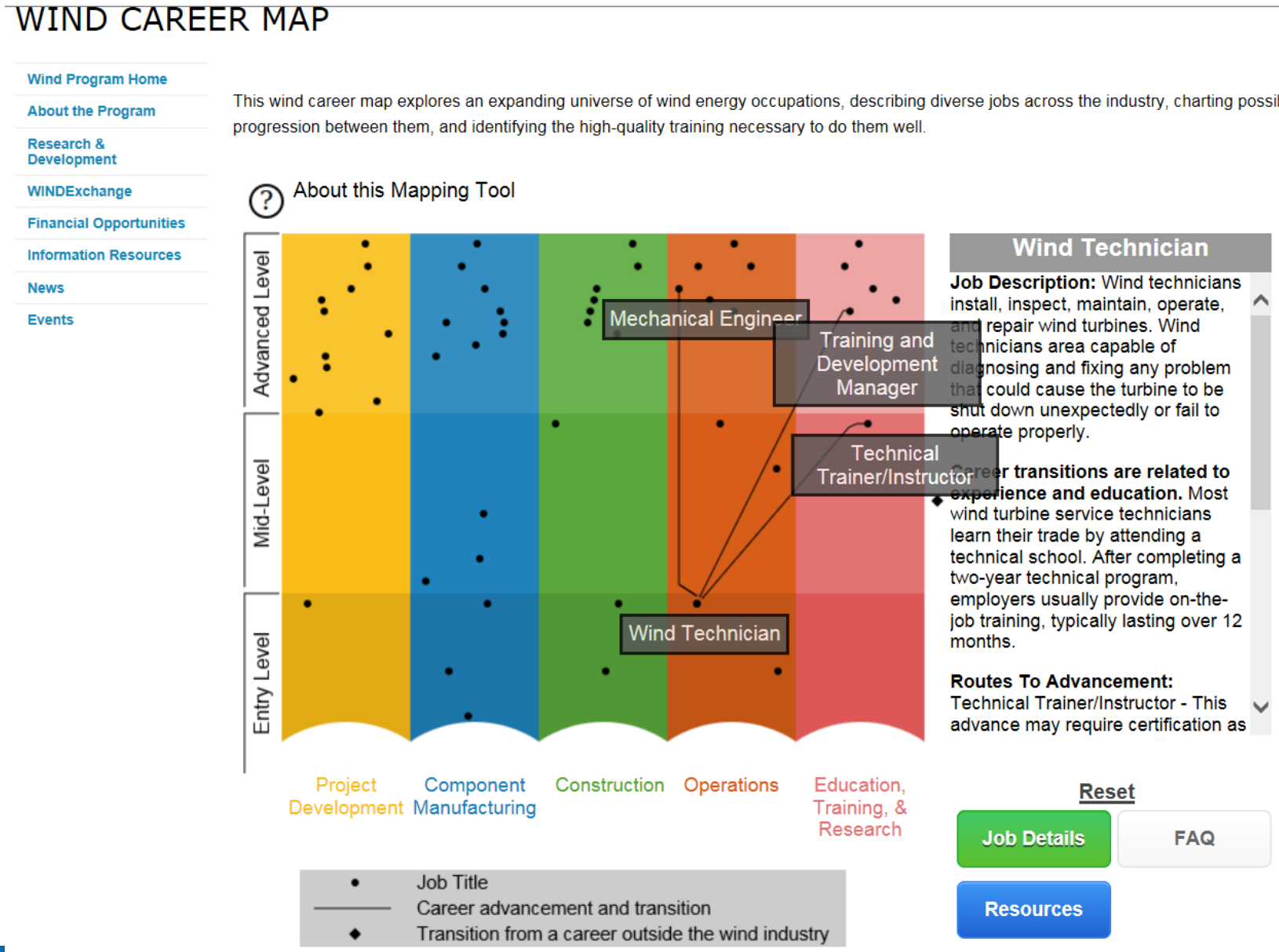
Selected Cross-Sector Routes

Reset

○ Technician >> Training Manager

FAQ

Wind Workforce – Wind Career Map



Collegiate Wind Competition

Stimulate student interest and industry awareness of a highly qualified next-gen workforce and new wind power education and training programs

2014 Inaugural Competition

- **10 undergraduate university teams**
- **3-day event held in conjunction with WINDPOWER 2014**

2015 Follow-up Technical Competition

- **3-day event at NREL's National Wind Technology Center**
- **Seven undergraduate university teams**

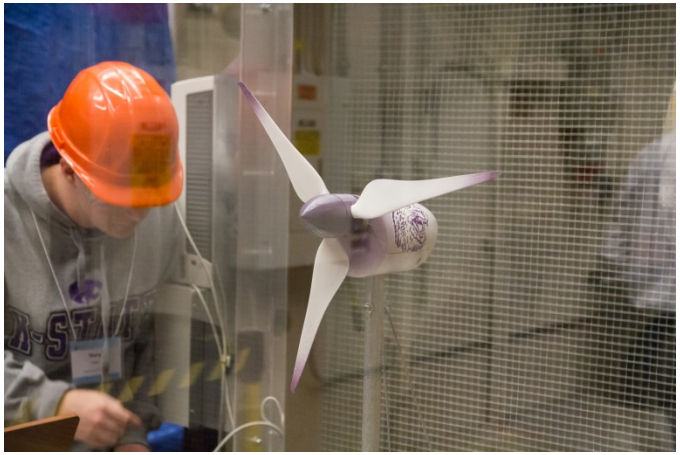


Photo by Lee Jay Fingersh, NREL 34112

Photo by Dennis Schroeder, NREL

DOE Wind Program Director with team members from Boise State, winner of the 2015 Technical Wind Competition

COLLEGIATE WIND COMPETITION
U.S. DEPARTMENT OF ENERGY

- **Design, build, and test a wind turbine**
- **Present on wind energy topics**
- **Deliver a cohesive business plan.**

Wind for Schools

- K-12: Introduce wind energy concepts into our school's science curricula
- University level: provide juniors and seniors with real-world skills/experience in wind energy applications
- Engage communities to consider wind energy benefits and costs
- Through Wind Application Centers, develop centers for excellence.

Photo from South Dakota Wind Application Center, NREL 18283

Photo from Joe Jacobs, NREL17945

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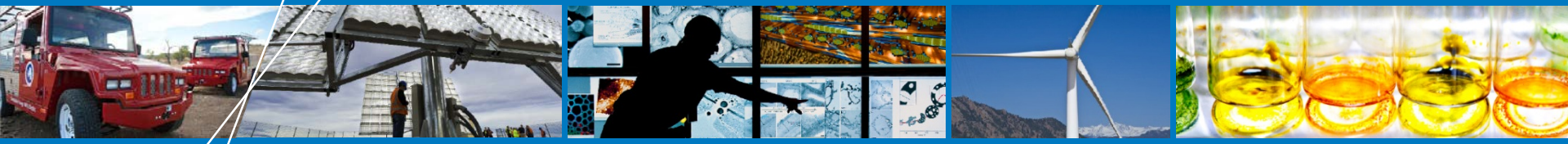

Thank you.