Educational Impact
University Research and Education for Wind Energy Workforce Development

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2016 Ports-to-Plains Energy and Agriculture Summit
Arbor Hotel and Conference Center
Lubbock, Texas
March 30, 2016
Overview

- Wind – a global industry
- Workforce
- The National Wind Institute
  - Research and Commercialization
  - Research Facilities
  - Jobs and NWI Education Programs
• Wind is a global industry, and renewable power installations continue to expand:

• The latest annual UN Report* reveals that 53% of all generating capacity installed last year around the world was renewable.

• Renewable Generation Investment for 2015 was $266 billion vs $130 billion for Coal and Gas

*"Global Trends in Renewable Energy Investment 2016"
Global Wind Power Capacity

MW

- Cumulative
- Constructed During Year

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For the US, Texas leads the nation in installed wind capacity at 14 GW of the 66 GW nationally.

Number of wind-related jobs in the U.S. at the end of 2014, across fields such as development, siting, construction, transportation, manufacturing, operations, services:

73,000
Estimated Total Wind Energy Jobs
(Professional jobs; 8-10% of total)

Total Direct and Indirect Jobs, est.

- US
- Global

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The US Department of Energy projects that wind energy in the US could grow to 20% of electrical power generation in the US by the year 2030. We are currently close to being on track at 66 GW of wind installed.
Professional Wind Energy Jobs

ESTIMATED NUMBER OF PROFESSIONAL JOBS THAT COULD BENEFIT FROM UNIVERSITY EDUCATION IN WIND ENERGY

- Other
- Operations
- Construction
- Manufacturing

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Non-Engineering Jobs in the Wind Industry related to University Education

- Resource assessment specialist
- Wind / wind power forecasting
- Technical sales and marketing
- Project development
- Utility liaison / interconnection
- Community liaison
- Regulatory / government liaison
- O & M management and supervision
- Supply chain management
- Manufacturing oversight/ mgmt.
- GIS specialists / Cartographers

- Wind project finance and analysis
- Marketing wind power and projects
- Energy commerce; Land Use
- Legal and regulatory specialist
- Permitting , Contracting experts (turbine supply, construction, PPA’s)
- Environmental / habitat specialists
- Ag. specialist / landowner liaison
- Architecture / visual impact simulation
We recommend to students that if their primary interest is engineering, for example, 

*Wind Turbine Design* or *Wind Power Systems*, 

that they Major in Engineering and

[Minor in Wind Energy.](#)
The National Wind Institute

Everything Wind!
Wind Energy at Texas Tech University

• 45+ Year History in Wind R and D
• Focus Areas
  – Wind Research and Field Site
    • PhD in Wind Science and Engineering
  – Industry and Business Partnerships
  – Education and workforce development

TTU-National Wind Inst.

Alstom wind turbine at Reese Center

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History cont.

- Beginning in 2003, TTU has been developing multidisciplinary programs in *wind energy* research and education.
Established in 2012 as the National Wind Institute, NWI is intended to serve as an intellectual hub for multidisciplinary research, commercialization and education related to wind science, wind energy, wind engineering and wind hazard mitigation.

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• Centrally located on the TTU campus
• Over 40 University Faculty Affiliates – From Engineering, Atmospheric Science, Economics, Business, and others
• Technical staff located at Reese Technology Center
DOE-SNL  Scaled Wind Farm Test Facility at RTC Field Site

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First in the nation
Graduate Certificate in Wind Energy (2009 – TWC Support)
- Both Technical and Managerial tracks
Bachelor of Science in Wind Energy (2011 – TTU Support)
- Approved Fall 2011 as a Science and Technology degree
- Offer a Minor in Wind Energy
- Offer an Undergraduate Certificate in Wind Energy

Significant investment to grow wind energy programs to current level.
NWI Educational Program – Metrics

BSWE Majors
Program approved by the TTU Board of Regents, August 2011

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- Fall 2011: 40
- Fall 2012: 100
- Fall 2013: 120
- Fall 2014: 160
- Fall 2015: 180
NWI Educational Program – Metrics

Wind Energy Course Enrollments

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NWI Educational Program Outreach/Partnership Activities

– **Outreach and Engagement project with Western Texas College**, Snyder, Texas – Curriculum development and licensing initiative.

– **Contract with DNV GL** – are providing tailored state of the industry case studies and support materials for the Graduate Wind Energy Certificate program courses.
  
  • (DNV GL is a leading international corporation for the energy value chain including renewables and energy efficiency and one of the top three certification bodies in the world) Run on the Wind Summer Camp for Middle School Students

– **Two STEM summer camps** with a focus on wind power and renewable electric technologies – partnered with TTU-IDEAL, on-campus, week long *Run on the Wind* (Middle School Students) and *GenTECH* (High School Students).
Landsailers at Reese Technology Center

“Run on the Wind” Summer Camp
TTU’s First BSWE Graduates
Fall 2012
Wind Energy Graduates have been employed by:
Questions and Comments