

# Comprehensive Workforce Plan to Shape & Accelerate the U.S. Wind Industry



Contact:

The Wind Alliance  
501(c)(3) Non-Profit Organization  
1100 Louisiana Street, Suite 5005  
Houston, Texas 77002  
Office: (713) 600-9994

John D. White, Managing Director  
[John.White@TheWindAlliance.org](mailto:John.White@TheWindAlliance.org)  
Mobile: (713) 816-1772

Claire Henkhaus, Associate Director  
[Claire.Henkhaus@TheWindAlliance.org](mailto:Claire.Henkhaus@TheWindAlliance.org)  
Mobile: (832) 744-0356

## I. EXECUTIVE SUMMARY

University wind programs do not exist in the U.S. at a level necessary to support predicted wind industry workforce demands. Although a few universities have well-defined wind energy programs, most programs are in their infancy, lacking breadth of curricula and depth of professors, or both. The fact is, of the 205<sup>1</sup> wind education programs, only *one* institution in the U.S., Texas Tech University, graduates PhDs in wind science and engineering. Professors who have attained doctorate-level education *in wind technology* must train and supervise the wind instruction of MS, BS and two-year programs. How does the U.S. accelerate the wind industry without wind PhDs?

According to Dr. Andrew Swift<sup>ii</sup>, former Director of the Wind Science and Engineering Research Center at Texas Tech University, the cost to develop and certify their wind doctoral and graduate program approached \$25 million over five years. Dr. Patrick Barry Butler<sup>iii</sup>, Professor and Dean of the College of Engineering at the University of Iowa, believes the most efficient solution to the immediate PhD deficit is to create a web-based platform to manage the existing resources and gain critical mass through the acceleration of graduated geographically dispersed PhDs. Upon graduation, PhDs are then positioned to develop wind programs at universities across the nation.

The 20% wind energy by 2030 goals necessitate the adoption of a purposeful, long-term wind energy workforce policy. This commitment must include funding for: (1) a platform where all elements of the wind industry anchor and operate together in a coordinated effort, (2) accelerated graduation of wind PhDs, and (3) widespread university wind centers. These commitments are not mutually exclusive and may overlap.

## II. THE PLATFORM

Currently, as *Figure 1* suggests, academia, industry and the public sector are moving in disjointed directions. Similarly, wind industry funding has been isolated and uncoordinated.

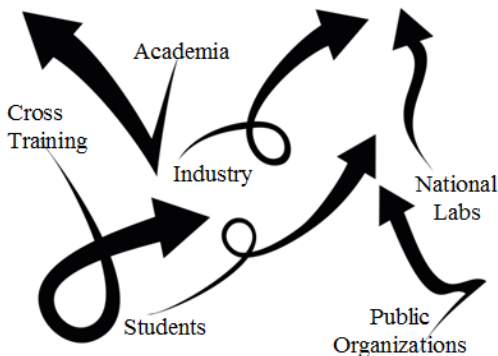


Figure 1: Current State of Industry – Disjointed

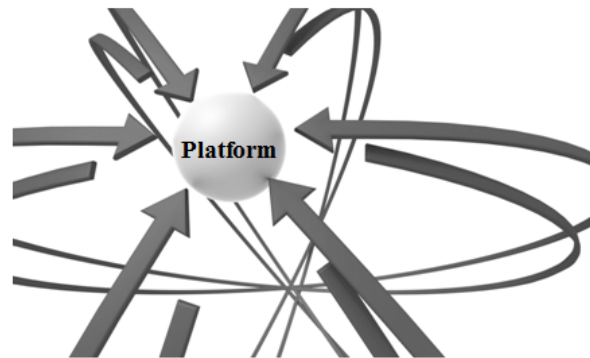


Figure 2: Proposed State of Industry Coordinated and focused with a single point of contact.

The industry must transform from *Figure 1* to *Figure 2* through a national, neutral Platform supported by a national policy commitment and investment. This Platform should coordinate, collaborate, communicate and facilitate the interests of the stakeholders within the wind industry – students, academia, industry, public organizations and international laboratories. The Platform must have the ability to create opportunities and administer national and international programs, including: a university inventory system; a web-based university portal offering full credit transfer and activities leading to the “whole student”<sup>iv</sup> concept; a cross-training program; national and international internships and reciprocal exchange programs; Co-op opportunities; publications and seminars; an out-of-use equipment program;

continuing education development; competitions; social networks; an industry driven scholarship program; and a wind for schools program.

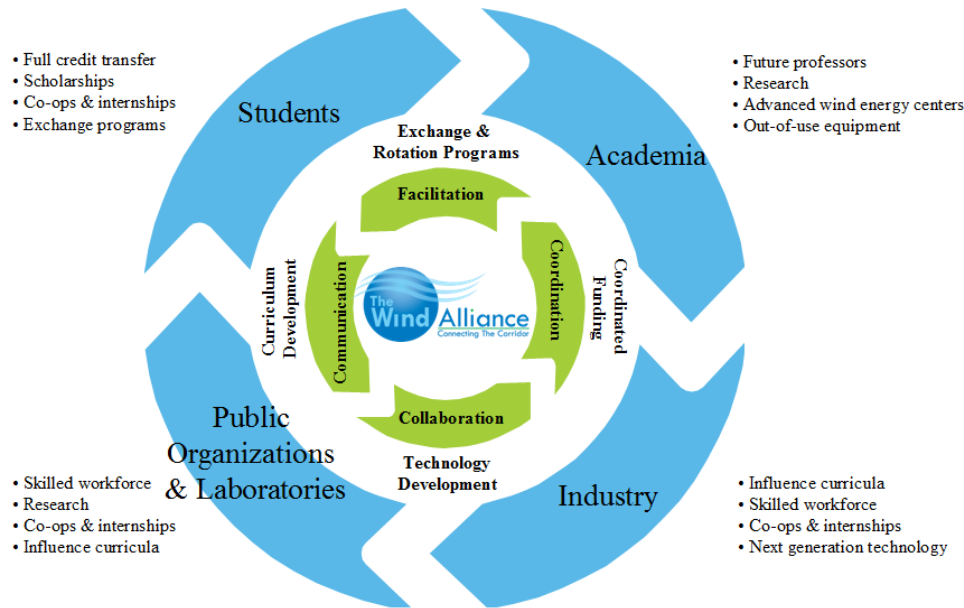


Figure 3: The Platform

The Platform is the mechanism to synergize the industry, as shown in *Figure 3*. The Wind Alliance<sup>y</sup> is poised to serve as this Platform. The Wind Alliance ([www.TheWindAlliance.org](http://www.TheWindAlliance.org)) is an established collection of industrial, academic and public-sector entities that collaboratively focuses on continuous pre-competitive improvement of workforce, infrastructure and technology within the wind industry. With more than 50 member entities, The Wind Alliance spans the nation from coast-to-coast and throughout the wind corridor. Members have well established working relationships and access to an unparalleled collection of physical assets and technical capabilities.

### III. PHD & UNIVERSITY WIND CENTERS

In today’s marketplace, advanced wind positions are globally competitive. According to Dr. Carsten Westergaard, Global Technology Director for Vestas Technology R&D<sup>vi</sup>, multi-national companies located in the U.S. hire wind PhDs from overseas to fill current workforce needs. The rate at which PhDs are enrolled in the U.S. must increase. Currently, the U.S. has 1/3 of the wind PhD’s enrolled compared to the Danish wind PhD enrollment. Wind industry growth will be severely constrained in the U.S. unless the critical deficit of wind PhDs is addressed. The number of PhDs needed to reach the U.S. wind workforce demands of 2030 is staggering, particularly considering the five-year lead time on a graduated PhD. The U.S. needs a minimum of 375 PhDs enrolled today, and that number should exceed 1,000 enrolled by 2030.

The solution is to form critical mass and momentum by graduating large quantities of geographically dispersed wind PhDs through web-based sharing of existing national and international university resources and by supporting these PhDs by investing in their development of wind degree programs across the nation. Knowledge disseminates from the PhD to the MS, then to the BS and finally to the two-year wind energy programs, enabling the academic and industry workforce demand to be met. Once this national, coordinated infrastructure is in place, industry may begin to leverage collaborative research opportunities for next generation wind technology.

The funding and incentive priorities for this vision are illustrated in *Figure 4*, below.

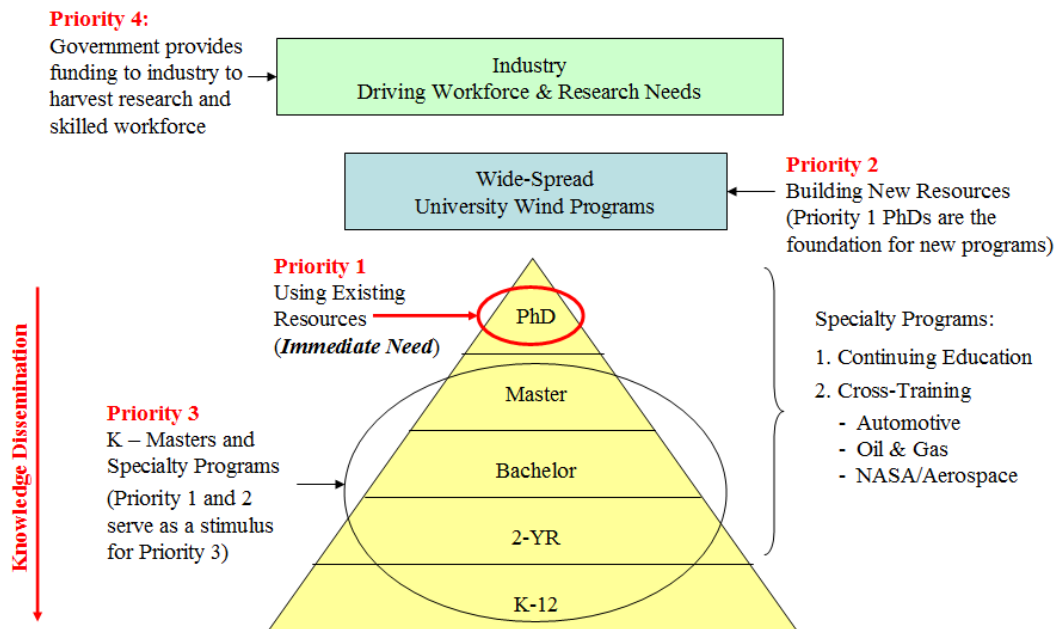


Figure 4: Proposed Vision & Priorities

**Priority 1: Accelerate graduation of wind PhDs to Provide Foundation for Workforce Infrastructure.** The objective is to graduate wind PhDs in the short-term by creating a web-based “virtual university” portal that combines existing resources among the 205 U.S education programs as well as international institutions, such as Denmark’s Risø National Laboratory. The program could emulate the *Great Plains Interactive Distance Education Alliance* model to gain critical mass, economies of scale and momentum (creating a “flywheel effect”).

**Priority 2: Build new university wind centers and programs around the graduated wind PhDs.** Newly graduated PhDs provide the necessary pool of professors to support an expansive network of national university wind programs. The Wind Alliance Platform will allocate funds to consortium universities that collaborate with the Platform to develop first-class, dynamic wind centers and degree programs.

**Priority 3: Develop academic infrastructure.** Kindergarten through masters and specialty programs (including cross-training and continuing education) will be implemented to support industry demand. These programs will be facilitated by the proposed Platform.

**Priority 4: Leverage academic infrastructure to promote a robust wind industry.** Funding should be provided to industry to harvest workforce and technology through collaborative academic institutions to engage faculty, catalyze new programs, attract students and spur technological innovation.

<sup>i</sup> AWEA, U.S. Wind Industry – 2010 Annual Market Report.

<sup>ii</sup> Dr. Andrew Swift, Texas Tech University, Co-chair of [The Wind Alliance](#) Workforce Committee.

<sup>iii</sup> Dr. Patrick Barry Butler, University of Iowa, Co-chair of [The Wind Alliance](#) Infrastructure Committee.

<sup>iv</sup> The “whole student concept” implies a graduate that has fulfilled course requirements as well as internships, labs, and other real-world activities.

<sup>v</sup> [The Wind Alliance](#) is an independent, 501(c)(3) non-profit organization with over 50 nation-wide academic, industry and public sector members and was originally formed by the members of the Lone Star Wind Alliance. The Lone Star Wind Alliance no longer exists.

<sup>vi</sup> Dr. Carsten Westergaard, Vestas Technology R&D, Chair of [The Wind Alliance](#) Technology Committee.