

Wind for Schools Project Curriculum Brief

Introduction

The U.S. Department of Energy's (DOE's) 20% Wind Energy by 2030 report recommends expanding education to ensure a trained workforce to meet the projected growth of the wind industry and deployment. Although a few U.S. higher education institutions offer wind technology education programs, most are found in community and technical colleges, resulting in a shortage of programs preparing highly skilled graduates for wind industry careers. Further, the United States lags behind Europe (which has more graduate programs in wind technology design and manufacturing) and is in danger of relinquishing the economic benefits of domestic production of wind turbines and related components and services to European countries.

DOE's Wind Powering America initiative launched the Wind for Schools project to develop a wind energy knowledge base among future leaders of our communities, states, and nation while raising awareness about wind energy's benefits. This fact sheet provides an overview of wind energy curricula as it relates to Wind for Schools.

A recent study shows that K-12 students with expectations for a science-related career are three times more likely to earn physical science or engineering degrees than students without similar expectations. This statistic emphasizes the important impact that life experiences prior to college can have on future career plans.



The Wind for Schools project recognizes the mutual benefits gained as university students learn not only through classroom instruction but also by participating as “consultants in training” on projects that involve analysis, planning, design, and implementation of small wind systems. Students at Kansas State helped to install a turbine as part of the Kansas State Wind Application Center. Ruth Douglas Miller/PIX16024

Wind for Schools Overview

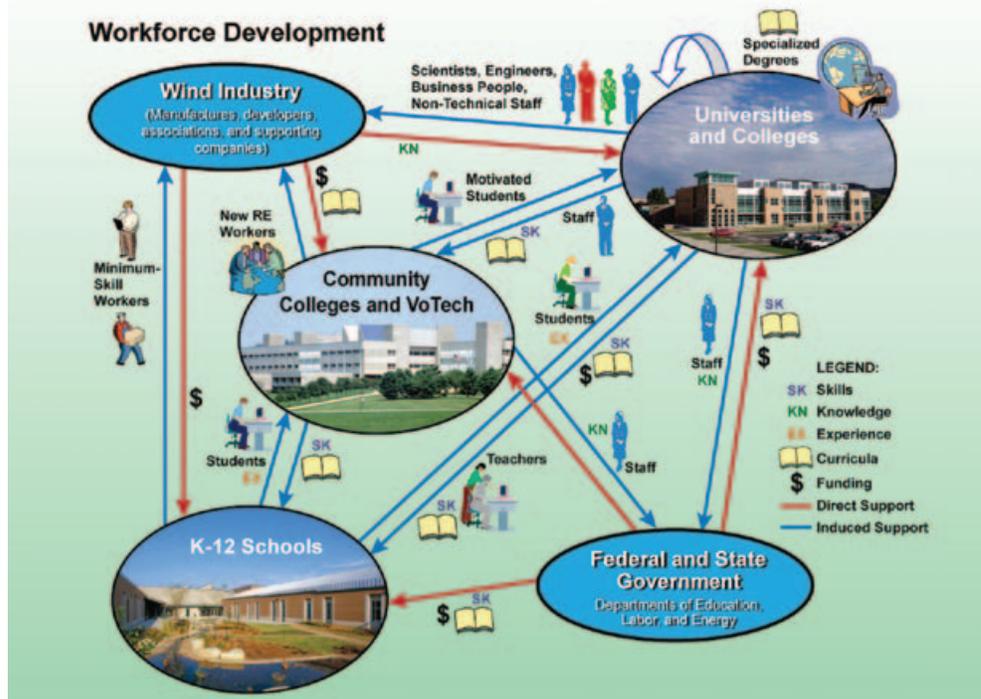
Wind for Schools addresses U.S. wind industry education concerns. Rural K-12 schools serve as “living laboratories” with small, operating wind turbines on their campuses (where possible). The turbine projects provide exposure to and context for principles of mathematics, science, and other applicable subjects. This exposure to real-world applications can have an important impact on future career plans: a recent study shows that K-12 students with expectations for a science-related career are three times more likely to earn physical science or engineering degrees than those without similar expectations.

Wind for Schools also educates college students in wind energy applications by establishing Wind Application Centers (WACs) at U.S. higher education institutions. A WAC's primary responsibility is to develop and implement wind energy curricula as one step toward graduating engineers, systems analysts, and other majors who are knowledgeable in the wind energy development process and motivated to pursue a career in wind energy. College students participate as “consultants in training” on the K-12 wind system projects, which involve

small turbine analysis, planning, permitting, design, and implementation. Mutual benefits are realized between the two groups as young K-12 students and their teachers can mine university resources for ideas and assistance.

Wind Curricula Advance under Wind for Schools

An integral component of Wind for Schools is developing and implementing new courses, modules, classroom activities, and field work into existing curricula at K-12 and university levels. DOE's National Renewable Energy Laboratory initiated Wind for Schools at state universities in Colorado, Idaho, Kansas, Montana, Nebraska, and South Dakota; the curriculum impacts at these institutions were recognized within the project's second year. Five additional states joined Wind for Schools in 2010: Alaska, Arizona, North Carolina, Pennsylvania, and Virginia. New courses have been created and existing courses enhanced with wind modules. The project's influence is apparent by the increased numbers of students who elect to take these courses and engage in wind-related projects. There is also a corresponding increase in the number



The Wind for Schools project promotes the exchange of knowledge and resources among industry, educational institutions, and the government. Federal and state governments and the wind industry provide direct support to K-12 schools, community colleges and vocational schools, and universities and colleges. Colleges, universities, and vocational schools provide induced support to government and the wind industry while all three levels of educational institutions support each other.

of students who choose to pursue wind energy careers.

Wind for Schools also supports teacher training and curricula developed by the National Energy Education Development (NEED) project, the KidWind Project, and Windwise Education. Wind for Schools emphasizes the importance of a small, operating wind turbine on a school campus to help students and teachers apply classroom lessons where possible.

The project brings together wind installations and data acquisition technologies that allow educators and students to collect and use electricity generation and weather data for research, analysis, and expanded class curricula. The data from wind turbines are stored so that students with computers connected to the Internet can access it for educational purposes. Students can compare data from a turbine at their school to turbines at

other schools. This data sharing greatly increases the educational impact of the turbine installations and allows schools without a viable wind resource to become involved in wind energy education.

Career Opportunities

The wind industry is experiencing record growth, and subsequently the demand for trained labor is increasing at all levels, from high school graduates to students with advanced degrees. Multiple federal agencies are coordinating their efforts to support the call from recently passed legislation and the Obama administration for new programs to help transition to a clean energy economy that will create thousands of new jobs in energy efficiency, renewable energy development, and sustainability.

A broad range of career opportunities already exists for individuals who wish to work within the wind industry, and the number of positions and career

paths is increasing quickly. Many of these opportunities are found within the manufacturing industry and will require trained managers, contractors, engineers, materials specialists, designers, operators of equipment and systems, assemblers, technicians, analysts, utility experts, legal professionals, sales/procurements specialists, and accountants. WAC participants are poised to excel in these professions.

Workforce Development Initiatives

The Green Jobs Act of 2007 authorized new workforce development initiatives that identify needed skills, develop training programs, and train workers for jobs in industries that include energy efficiency and renewable energy. DOE's Office of Energy Efficiency and Renewable Energy recognizes the importance of coordinating efforts across programs to ensure that a skilled labor force is available to develop and deploy energy efficiency and renewable energy technologies and has dedicated new resources to promote a strong workforce to service a new green economy.

Summary

Wind for Schools connects universities that engage in wind power to rural K-12 schools that can benefit from Wind Application Center support. Wind for Schools assists communities in implementing sustainable school wind energy projects and provides the resources to effectively advance science education in a way that is appealing and accessible to students and teachers. A viable WAC and partner schools can simultaneously advance education and workforce development.



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