

Harnessing The Power of

Wind Energy

BY TAWNY M. DOTSON

“Where the wind comes sweepin’ down the plain” is more than just a song lyric for Oklahoma’s career and technical education community. It’s the acknowledgement of an untapped natural resource that has the potential to translate into both energy independence for the country and jobs for the state. Statewide, technology center instructors and administrators, Oklahoma’s Department of Career and Technology Education (*CareerTech*) staff, state officials and business partners are working together to develop and deploy training programs that will foster economic development, a positive environmental impact, budget savings and create local jobs.

The United States government issued a report forecasting what it would take to get 20 percent of U.S. energy from wind power. Oklahoma’s Department of Commerce heard that call and is ready to be a part of the answer, relying on *CareerTech* to get the state there. Commerce department officials estimate that Oklahoma will be the nation’s second-largest generator of wind power by 2030, generating 9 percent of electricity in the United States.

Economic Development

Advancing wind energy and renewable power in Oklahoma means creating “green collar” jobs for Oklahomans and capitalizing on an abundant natural resource. Oklahoma’s commerce department estimates the industry could produce \$500 million in tax revenue and 18,000 jobs for Oklahomans over the next 10 years. Within five years, the wind industry cluster could create almost 7,000 jobs across the state, with average salaries increasing from \$44,900 the first year to \$60,400 by the fifth year. The department expects \$1.48 billion in total personal income to be created from the wind industry cluster alone. Total economic activity over five years, represented by gross domestic product, will be greater than \$2.48 billion.

“Oklahoma is eighth in the nation for wind resource,” said Kylah McNabb, wind development specialist at Oklahoma’s Department of Commerce. “Twice what Texas is ranked.”

A typical wind energy farm produces a great deal of economic impact, according to some of the Oklahoma cities that are home to existing wind energy companies. The money starts to come to the community in the form of land leases

and construction jobs. In addition, the hospitality industry and sales tax revenues will increase, and, eventually, ad valorem taxes—which fund most Oklahoma schools—will also go up.

Environmental Impact

In addition to its economic impact, wind energy appears to have no emissions or fuel requirements. Recently, issues have arisen concerning the animal populations affected by the placement of wind turbines. Since the turbines are generally in open prairie space, their placement can infringe on the needed space for certain animals; the habitat within one mile of a tower is generally unusable.

“We are getting better at placing wind turbines,” McNabb said.

The Oklahoma Nature Conservancy is studying the environmental impact on the land and animals around wind turbines. The organization has worked with wind-energy developers to ensure the turbines are being placed in areas with the highest potential for wind, and also have limited sensitive habitat around them.

Curriculum

A challenge exists in developing curriculum for a new industry. Currently no national standards exist on which schools can model their training initiatives. Although there are organizations working to establish this standard, *CareerTech* and the commerce department have had to forge a path on their own. *CareerTech* began working with the Multi-State Academic and Vocational Curriculum Consortium (MAVCC), and McNabb, to develop curriculum that would meet the need for trained workers in the wind energy industry. McNabb has more than six years experience working in the industry and holds a hybrid position that reports to both the commerce department and *CareerTech*. Her contacts allow her to connect industry leaders with curriculum writers to ensure Oklahoma’s training reflects the relevant skills and training

needed for the future of the industry. The commerce department turned to *CareerTech* knowing the immediacy with which the system can respond to the needs of business and industry.

“*CareerTech* can train new workers for the industry and save the businesses money,” said McNabb. She points out that a typical worker may need four weeks to become fully trained as a wind energy technician; but with training from *CareerTech* focusing on safety, hydraulics and electronics, that time can be cut down to just days. A number of schools and training organizations are starting programs in wind energy and Jan Huston, director of MAVCC, has collaborated with many of them.

“We have already completed two modules and look forward to a meeting of curriculum writers and industry professionals in April,” said Huston. “We are committed to monitor the industry and find the next step.” At the meeting, Huston will continue to work with a committee to develop the standards that all technology centers will use to instruct future workers in the wind energy industry. Part of the curriculum equation is establishing an industry language and Huston is confident that such meetings will help that language emerge. *CareerTech*’s curriculum will initially be for a wind turbine technician career major. “This is the person performing maintenance troubleshooting,” said Huston. “Most start-ups in Oklahoma appear to be focused on wind turbine technicians.”

According to Huston, the curriculum will be set up in a modular approach so that students can pick and choose content based on what they need, and the technology center can be flexible and choose what it wants to offer. The final product for students will be certification in a curriculum that places an emphasis on safety.

Local Benefits

Autry Technology Center in Enid, Oklahoma, began the process to install a wind



Autry Technology Center, in Enid, Oklahoma, is the home of a small wind turbine. The center plans to start offering wind turbine technician courses soon in an effort to build a skilled workforce for the wind energy industry in Oklahoma.



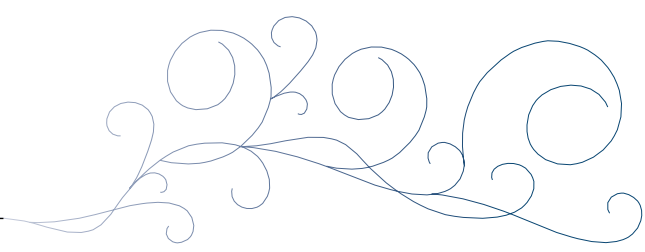
Red River Technology Center electronics students Landon Blalock (front) and Alex Kline (back) simulate converting the energy produced by a DC generator, like the one in Red River's new wind turbine, to an AC current for household use.



Red River Technology Center electronics student Keziah Cook learns the basics of making an electric motor using electromagnetism. Red River's turbine has provided the school with more than 600-kilowatt hours of electricity in three weeks.



Within five years, the wind industry cluster could create *almost 7,000 jobs* across the state, with average salaries increasing from \$44,900 the first year to \$60,400 by the fifth year.



turbine on its campus after being approached by a wind energy company at a superintendents' conference last year. The company, Endurance Wind Power, touted the benefits of the turbine's economic impact through reduced electricity bills and the prospect of developing a new skill training program at CareerTech. Autry officials decided that they were interested in starting a training program, but recognized the need to go much further.

"We thought if we're going to be out there promoting wind energy training we have to be willing to do it ourselves," said Marcie Mack, assistant superintendent at Autry.

Autry installed an Endurance Wind Power Model 250 wind turbine. The complete unit is more than 85 feet tall and the turbine weighs more than 650 pounds (considered a small turbine). Administrators report the turbine, which took only a few short weeks to install, produced 720 kilowatts of energy for the school in a two-week period. It registered maximum wind speeds of 51.9 miles per hour, and the school expects it to last between 15 and 20 years. In addition to the economic benefits, Autry has embarked on establishing a wind turbine technician program for the school. An existing mechatronics program will provide some electrical and mechanical basis for the training, with the additional focus on safety.

"Our intent is to provide students the training they need to have a base knowledge of how to function at the company on day one," said Mack.

Autry has already received many positive comments on the turbine. While many are comments of curiosity, community members are impressed by its quietness. Overall, three technology centers in Oklahoma are well on their way to established wind turbine technician programs, and two have installed wind turbines on campus. Nationwide, the wind energy business

continues to develop at a rapid pace. Oklahoma is no different and the harvest needed to meet the needs of our nation's energy demands will rely on a new, skilled workforce trained through innovative means like those being developed. **T**

For More Information:

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High Plains Technology Center
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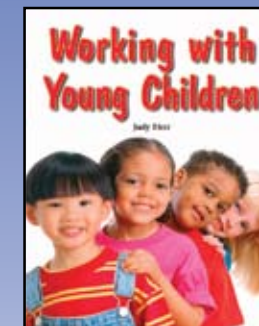
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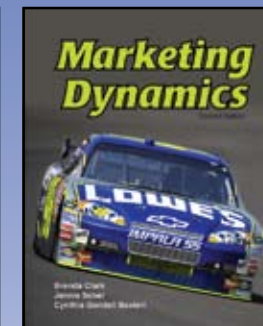
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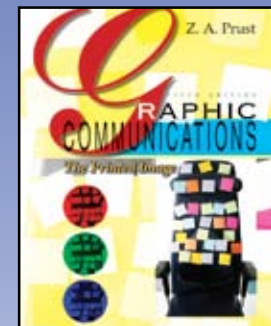
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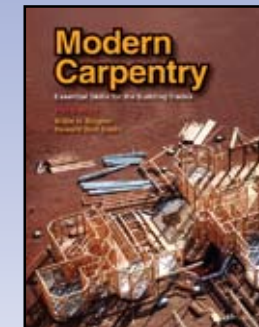
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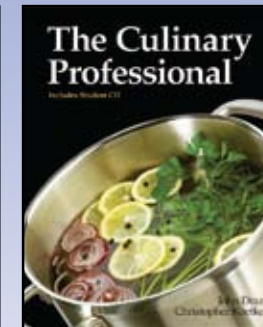
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