WIND POWER: GENERATING LOGISTICS OPPORTUNITIES

The wind power industry continues to grow, expand, and excel domestically—and equipment manufacturers and specialty transportation providers are growing with it.

While the U.S. economy continues its slow climb toward recovery, a few industries are leading the way with strong, steady, and consistent growth. The wind power industry is among them.

More than 100 separate wind projects are currently under construction in 31 states, according to the American Wind Energy Association, a wind development trade association. The U.S. wind industry has added more than 35 percent of all new generating capacity over the past four years—second only to natural gas, and more than nuclear power and coal combined.

Several factors are contributing to this growth. Thanks to a federal push, many states have adopted clean energy goals and are striving to make progress toward them.

Bumps in the Road

Although the wind power industry shows solid signs of growth, it also remains somewhat volatile.

One reason is that the federal renewable energy production tax credit (PTC)—the primary financial policy for the wind industry since its inception in 1992—has been extended mostly in one- and two-year intervals, and even allowed to expire on occasion.

"The market has been volatile over the past five to 10 years, due partly to the PTC tax subsidies' inconsistency," says Ken Adams, director of international marketing and sales for industrial products at Union Pacific Railroad. "Every time the PTC expires, the industry tends to have a bad year until it is renewed. The tax credit is set to expire again at the end of 2012, so there is a huge push to get projects going before then."

Industry advocates are making progress toward longer-term tax policies, which would help provide consistency and market certainty. On Nov. 2, 2011, Washington Representative Dave Reichert and Oregon Representative Earl Blumenauer introduced a bi-partisan four-year PTC extension bill in the U.S. House of Representatives. The American Wind Energy Association, a wind development trade association, is working with congressional supporters to introduce a similar bill in the Senate.

In addition, policies in most states offer producers and consumers incentives and tax credits to make wind energy more affordable.

Federal tax credits are also helping wind projects come to fruition. The federal renewable energy production tax credit (PTC), originally included in the Energy Policy Act of 1992, provides an income tax credit of 2.2 cents/kilowatt-hour for electricity produced by utility-scale wind turbines.

Also contributing to the wind industry's growth is the development of new technology that allows wind farms to locate outside the traditional wind corridor—generally defined as Nebraska, Kansas, Oklahoma, Missouri, Arkansas, Louisiana, Texas, and New Mexico.

"Some of the best wind sites have already been fully developed," says Kenneth M. Lemke, Ph.D., economist for the Nebraska Public Power District electric utility, based in Columbus, Neb. "But new wind power technology allows wind to be captured in areas that might not have been considered good sites five years ago. This combination of technology and a big country means running out of wind farm sites is not a near-term concern."

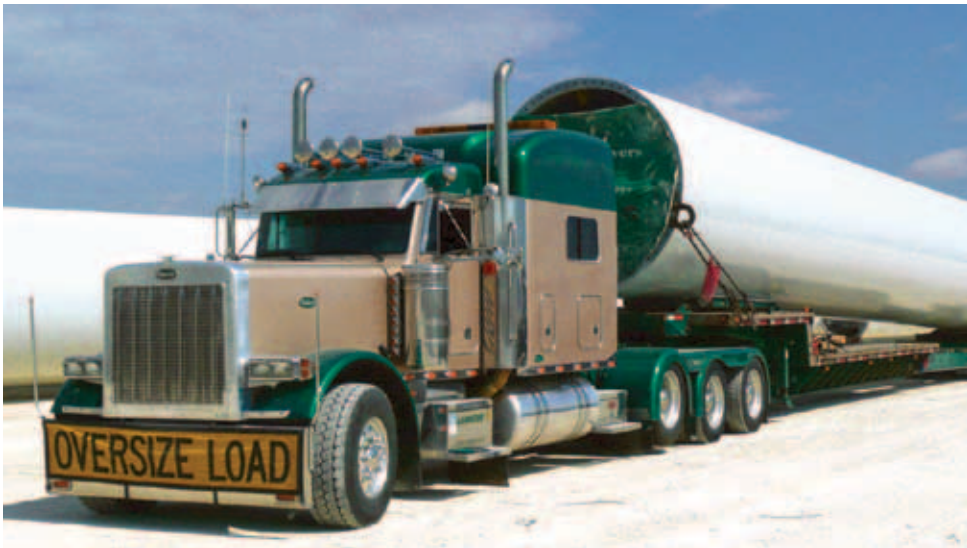
A Growing Industry

In addition to new development, many of the first wind farms ever built may need to be replaced over the next several years as new technology continues to evolve. All of this means good news for the growing industry.

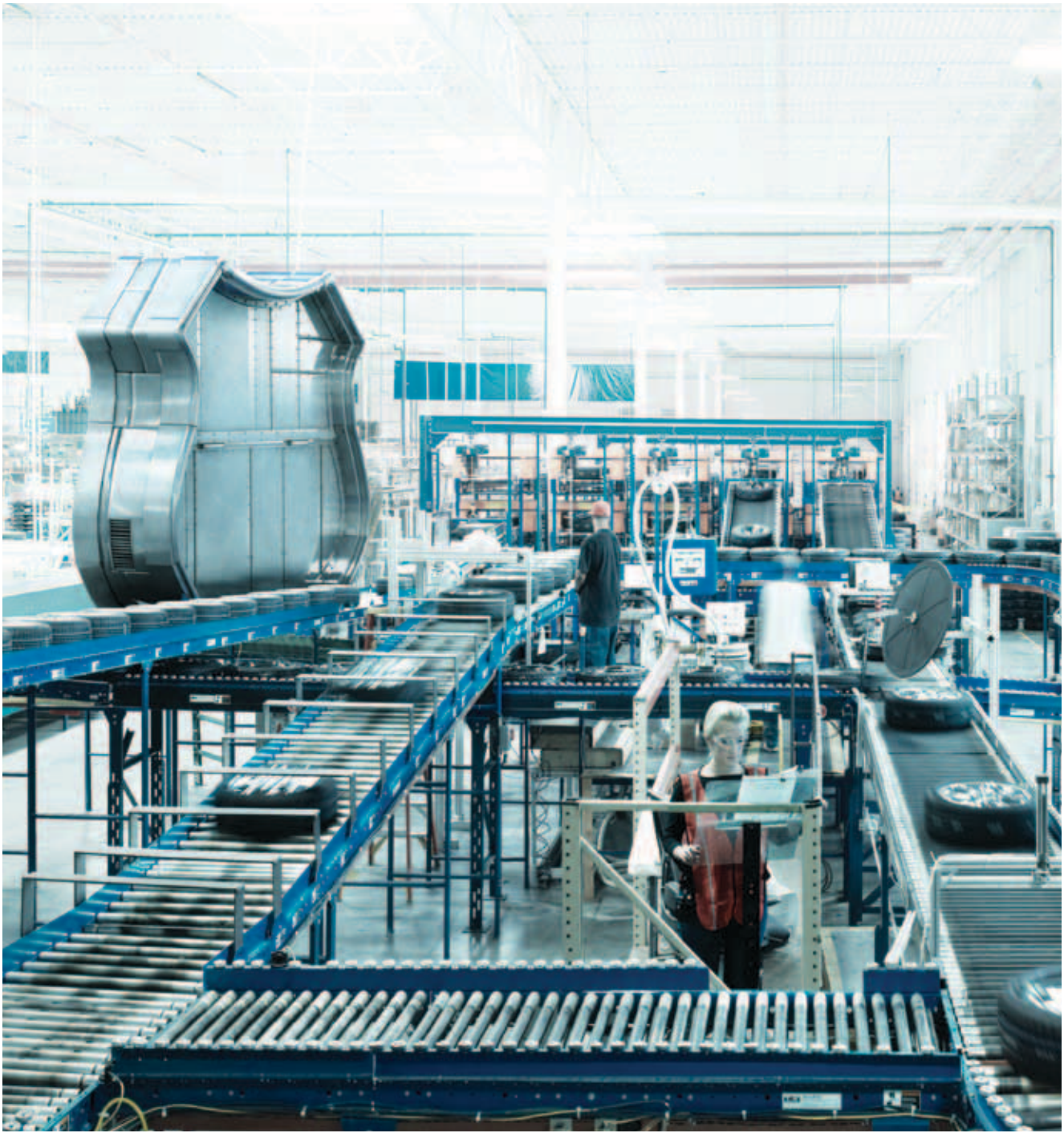
And good news for the wind industry means good news for other industries as well.

"There has been significant growth in domestic wind component manufacturing over the past several years," says Doug Graham, senior director for Union Pacific Distribution Services (UPDS), an Omaha, Neb.-based subsidiary of Union Pacific Railroad (UP) specializing in designing and executing rail-based logistics programs. "Initially, many large wind components were imported to the United States."

Today, more than 400 manufacturing facilities across the United States produce wind turbine components



Increased wind farm development led specialized logistics provider Landstar to invest in the modified equipment required to transport the components.



Union Pacific offers expedited auto parts delivery in the U.S., Mexico and Canada. Plus, logistics experts to help you manage inventories. No matter what you ship, whether it's auto parts, electronics or even produce, our vast resources and networks might just be the shipping solution you've been searching for. Visit UnionPacific.com or call (877) 883-1422.

Wherever you find business, you'll find us.

UNION PACIFIC

BUILDING AMERICA®

150 YEARS

Transporting wind power components by rail allows shippers to circumvent some of the complications involved in moving the large equipment over the road.

such as towers, blades, and the assembled engine housings known as nacelles.

Domestic wind power manufacturing facility development has driven improved efficiencies in transporting the equipment. "We used to move components 500 to 1,000 miles by truck to reach the wind farms," says Jay Folladori, vice president of heavy/specialized services for Landstar, a Jacksonville, Fla.-based third-party logistics (3PL) provider. "The rise in domestic wind power equipment manufacturing reduces mileage to the farms. We are now using a hub-and-spoke distribution approach, which also reduces costs."

Investing in the Future

Wind farms are more financially attractive to developers today than they have been in the past. "Turbines continue to grow larger and cost less, and the combination of higher megawatts and lower price is pushing growth," says Ken Adams, director of international marketing and sales for industrial products at Omaha, Neb.-based Union Pacific Railroad.

The push to place wind farms in non-traditional locations has created challenges along with opportunity.

"Many new developments are on top of mountains and in other

Giving Wind Energy A Lift

Landstar is uniquely equipped to handle all your specialized transportation logistics needs.

Landstar is the largest platform capacity provider in North America and ranked #2 in the world according to *International Cranes & Specialized Transport*. Landstar is recognized as a leader in the industry when it comes to safe, reliable, on-time delivery.

Uniquely equipped to handle all your specialized transportation logistics needs.

- Double drops
- Extendables
- Multi-axles
- Steerables
- Beam Trailers
- Removable Goosenecks
- Schnabel Trailers
- 600 5-13 axle RGN units
- Lowboys with 40-80 ton capability
- More than 1,500 Stepdeck Trailers
- Flatbed & Stepdeck Stretch Trailers

Let Landstar configure the right combination of equipment to move your freight – whether it's hauling one load or managing and executing entire project moves.

LANDSTAR®

877-428-5432 www.landstar.com

SUPPLY CHAIN SOLUTIONS • AIR • OCEAN • WAREHOUSING • RAIL INTERMODAL • TRUCKLOAD • LTL • HEAVY HAUL/SPECIALIZED • EXPEDITED

hard-to-reach areas," notes Folladori. "The trucks and trailers that transport wind farm components are meant for use on highways, not mountaintops. Delivering to the new locations increases transportation costs and adds complexity."

Carriers taking on wind power logistics projects have to invest capital in specialized trailers and equipment. Heavy haul has always been part of Landstar's business, so when the wind power sector started to take off, the 3PL acquired the modified equipment necessary to transport wind power components.

Equipped for Success

Landstar now provides road transportation for a variety of wind energy manufacturing companies.

"We haul hundreds of blades, towers, and other components," says Folladori. Landstar also participates in wind farm construction project management to coordinate site preparation and delivery.

"Landstar's investment in wind power logistics has grown along with the wind power industry," says Folladori.

One challenge facing wind power logistics providers is the increasing size of the components. Advancing technology does not mean smaller components; in fact, the more powerful turbines become, the bigger they get.

"Wind power component dimensions dictate the equipment required to move them, and the ability to travel specific routes through each state," says Folladori. "Each state has different heavy and oversized load permit requirements, and arranging them demands impeccable coordination and timing.

"The increasing size of wind tower components is making it harder to transport them," he continues. "Height and weight are being pushed to the maximum. Many states are working to simplify the permitting process, but it's a challenge for them to find the resources when they are struggling financially."

Wind farms such as Nebraska Public Power District's Ainsworth Wind Energy Facility serve as a clean, inexhaustible, domestic source of electric generation.

Along the Railway

For some shippers, transporting wind components via rail makes more sense than over the road. Although there may be fewer restrictions and planning concerns involved with rail moves, they still demand extensive preparation.

Experience helps facilitate the planning process. UP and UPDS have been providing rail transportation and logistics services to the wind power industry since 2007.

"Oversized loads require developing dimensional transportation solutions," says UP's Adams. "We consider where the components have adequate bridge and tunnel clearance, and whether distribution centers can handle the trains and the volume. A multitude of considerations go into making a wind power component project successful."

The rise in domestic manufacturing sites has been key to making wind farm logistics work more efficiently. "Union Pacific transports wind power components via rail to distribution centers close to wind farms," says Adams. "This approach allows shippers to minimize truck usage, as well as turn trucks faster."

"Transporting components 50 to 200 miles by truck instead of thousands of miles simplifies wind farm development," says Graham. "It helps project planners ensure the right components arrive at the right time."

Pursuing Alternative Resources

As the wind power industry grows, electric utilities across the country are increasingly adding wind energy to their power supply portfolios as a clean, inexhaustible, and domestic source of electric generation.

One of those forward-thinking utilities is Nebraska Public Power District (NPPD), the state's largest electric utility, which delivers power to about one million Nebraskans. Headquartered in

Columbus, NPPD was founded in 1970 when two power companies merged.

"More than 50 percent of our energy was produced by non-carbon resources in 2010," says Lemke. "It's important to draw from a diverse mix of resources. Wind and renewable energy help maintain that diversity and reduce risk going forward."

Nebraska is the only 100-percent public power state, which means NPPD had some legislative issues to resolve before it could begin developing power facilities.

"Public power has the right of eminent domain for generation facilities," says Lemke. "Because the legislature has removed that barrier in the past few years, 50 more projects are developing today."

The Ainsworth Wind Energy Facility is the state's largest publicly owned wind farm. Located six miles south of Ainsworth, Neb., the facility has been in operation since 2005, generating more than one billion kilowatt hours of wind-powered electricity for NPPD customers. The facility, the second-largest publicly owned wind farm in the country, operates 36 1.6-megawatt turbines.

A Bright Future

Among the states, Nebraska ranks third in terms of wind potential. "A new transmission line planned for Nebraska will improve energy flow in and out of the state," says Lemke. "That development will further improve the potential for new projects."

Both NPPD and Omaha PPD, the two largest electric utilities in the state, have established goals to improve renewable energy resources 10 percent by 2020, and wind power will likely play a large role in pursuing those results.

The incentives and opportunities that exist today have huge potential to make wind power generation in the United States more prominent. This push for renewable energy sources can help the country in its effort to reduce its dependence on foreign oil, protect the environment, and stabilize energy costs. But it's a combination of many factors, including safe, reliable and affordable wind power component transportation options, that will make it all work.

"The wind energy industry holds promise for thousands of jobs and for increased clean energy production," says Folladori. "And both of those goals are extremely important."