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**Panelist:** Ty Haines  
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**Organization:** GLWN™ Program  
WIRE-Net

**Testimony before the U.S. – China Economic and Security Review Commission**  
*The Challenge of China's Green Technology Policy and Ohio's Response*

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– Ty Haines, VP Manufacturing Services, WIRE-Net

July 12, 2010

**Pivotal Year for US Wind Supply Chain**

June 2010

By Ed Weston

Two utility-scale turbine assembly plants began American operations last year and three more are coming online in 2010, bringing the domestic total to nine. This should be great news for manufacturers looking to diversify and take advantage of regional opportunities. But larger turbine designs, a temporary drop in demand, and investment uncertainty are making this a pivotal year for the US supply chain.

Already, the US parts sourcing base are affected by the increasing size of turbines. Ductile iron castings, which comprise many of the largest structural elements of a turbine, are growing beyond the capability of many foundries to produce them.

For instance, if a 1MW turbine requires a 10-ton casting, there are probably a half dozen domestic suppliers. As turbines increase to 3MW, castings requirements increase to 30-tons, for which there may be just two or three suppliers. At 5MW, domestic sources may be reduced to just one or two.

Towers manufacturing will also be affected. Larger turbines call for larger rotors requiring taller towers of up to 120 meters. New designs may include concrete bases and modular construction to reduce weight and transportation costs. At the same time, crane requirements will be extended to accommodate the additional height and nacelle weights, which will reach 300 tons for offshore turbines.

Blade length will also grow with turbine size, requiring larger production facilities and additional handling equipment. New plants will need to be built in locations close to both expected project sites and an available workforce.

**Supply Chain Outlook**

Since the fall of 2008, several factors have chilled the rate of manufacturing orders to supply chain companies. New orders for turbines dried up until the US federal government's economic stimulus

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package took effect last summer. World turbine prices dropped, and when combined with extra inventory stockpiled from undelivered orders, excess capacity now available offshore, plus a falling euro, the result has been a return to the wrong side of the boom-and-bust cycle for domestic wind component manufacturers..

But signs of market recovery are in place. "We're seeing financing coming back, which puts additional burden on getting deals done," says Dan McDevitt, VP of Supply Chain for Nordex USA, the German wind turbine manufacturer which is currently constructing a factory in Arkansas to build its turbines.

Siemens, which plans to open its new Hutchinson, Kansas assembly plant in December, reported in February that its entire capacity for new turbines was sold out worldwide through the end of the year. Meanwhile, a number of wind turbine manufacturers, or original equipment manufacturers (OEMs), and specialized suppliers from Europe continue to operate in a holding pattern, awaiting a stronger market before ramping up new North American operations.

US manufacturers remained logistically advantaged within the world's leading wind market for the past four years until finally overtaken by China last winter, and there's a desire by domestic wind turbine plants to capitalize on the proximity of available suppliers. "I deal with the majority of the large OEMs operating here in the US," added John Purcell, VP of Wind Energy for Leeco Steel, "and all have told me their preference is to buy locally in each of their markets. They much prefer this over an extended international supply chain."

For large components, the savings from buying American currently translates into 10-20%, plus avoiding weeks on a boat. Most turbine OEMs prefer to assemble turbines and source parts in a chosen market because it protects against currency fluctuations between countries.

Other US supply chain strengths include an incredible appetite for diversification, as evidenced by the record-breaking crowds at recent annual conferences hosted by the American Wind Energy Association and strong attendance at regional supply chain events.

There's a real interest in investing, too. Top notch machining capacity has been added across the Midwest, and European supply chain veterans are bringing their technology to US facilities. ThyssenKrupp's Rotek, for instance, invested \$80 million last year in an Ohio ring mill as part of an expansion to eliminate a former industry bottleneck for slewing rings. These are the giant diameter rings coupling the top of a turbine tower to the moving nacelle base and the blades to the rotor hub. In February the US Department of Energy announced the awarding of economic stimulus grants to 29 component manufacturers for additional capital projects totalling \$160 million.

Looking forward, the best opportunities on the manufacturing side will include large castings, bearings, generators, composites for blades and nacelle housings and turbine control systems. On the services side, demand will be robust in operations and maintenance, turn-key contractors that cover engineering, procurement, and construction (EPC), and logistics companies (trucking, rail, barges for onshore and offshore) as well as suppliers to these industries.

Many components for wind are industry-specific, and joint ventures with experienced off-shore suppliers can provide a jumpstart for US manufacturers wanting faster results. Another source of competitive advantage will be to offer an entire ready-to-assemble component or system rather than individual parts. For example, a company could sell castings as a final package that takes the product from raw casting, machining and finish coating instead of the business being broken up as it often is in today's domestic wind supply chain.

For US component suppliers, major challenges remain. The nature of wind turbine OEMs is extremely risk-averse, and the qualification process to approve even the most capable component suppliers can extend beyond a year. Competition is global and fierce. Over the past decade Europe has developed a robust, cost-effective network of suppliers, many of whom are delighted to export to the US. In Asia, recent investment has created new supply chain resources with available capacities that are targeting the US market. For US domestic manufacturers, the mandate for wind industry success is extraordinary quality and a ruthless commitment to beat down costs through best practices, continuous improvement and new technology.

## The Path Forward

Industry executives see cost-competitiveness as crucial to long-term growth, and new capital investment that adds both capacity and efficiency will be critical. Most agree that the government has an important role to play. “The number one thing needed is to establish a balanced, well-thought out national energy policy including a renewable energy standard that runs for at least ten years out,” says Richard Morrison, President and CEO of Molded Fiber Glass.

A renewable energy standard, or renewable electricity standard (RES), is a public policy that requires electric utilities source a rising percentage of their power from renewables. More than half of US states have such policies and the push is fierce in the wind industry to establish a federal RES for the country. “Doing this will change the uncomfortable, risky situation we now have in which we’re facing making large, long-term investments in an uncertain market environment.”

Nordex’s McDevitt agrees. “When I talk with people in Europe, I hear a real concern about whether the US wind market will come back strongly. A good national energy policy will remove lots of those doubts and give our industry the long-term footing we need to compete against other technologies.”

But many agree that there’s another important policy step to fully develop the domestic supply chain, and that is to create parity between US and Asian companies. Complaints are frequently heard of Asian components being sold here for the cost of raw materials. Causes are traced to currency manipulation of the Yuan (which some economists estimate has created a subsidy of 25-40%) and to common practices such as loan forgiveness, which enables start-up companies to write off their overhead debt and quote new orders on only variable costs (Windpower Monthly, May 2010).

“We need the government to level the playing field,” explains Joe Simko, Vice President of Business Development for Hodge Foundry. “If we received economic stimulus money, we would invest to improve our competitiveness, win more business, and create jobs on American soil.”

### About the author:

Ed Weston is director of the [Global Wind Network, GLWN™](#), an international wind energy supply chain advisory group and network of manufacturers and suppliers whose mission is to increase the domestic content of North America’s wind turbines and grow the wind industry. Ed has led manufacturing teams in start-up, turn-around, and fast growth situations for multi-national and privately-held firms. He holds degrees from the University of Illinois and Purdue University.