



# Wind Power **LOGISTICS** and **TRANSPORTATION**

Transportation is a critical part of the logistics and cost structure of a wind power project and is one of the reasons the U.S. has shifted dramatically toward domestic manufacturing.

The costs associated with transportation and logistics of the large, heavy components of wind turbines make it desirable for turbine and component manufacturers to set up shop as close as possible to the ultimate point of turbine delivery to improve competitiveness.

In addition to other factors, transportation and logistics is one of the main reasons domestic content of wind turbines installed in the U.S. has grown to 67 percent, with over 550 manufacturing facilities around the country supplying components to the wind industry.

## 1 The Transportation Logistics Working Group of AWEA

As wind farms continue to sprout up across the U.S., so does the need to mitigate logistical challenges associated with transporting turbine parts and material components to project sites.

As a result of this, the American Wind Energy Association (AWEA) sponsored a meeting at the WINDPOWER 2010 Conference & Exhibition in Dallas to discuss the transportation and logistics needs of the wind industry with the leadership of this industry segment. Many issues were discussed and submitted for recognition. The formation of the Transportation & Logistics Working Group (TLWG) began with these initial discussions.

The first-ever AWEA "Transportation & Logistics Summit" was held at the AWEA Supply Chain workshop in March 2011 in Little Rock, Arkansas.

This event brought together participants from all parts of the wind energy industry, with the stated goal of leading efforts to eliminate or minimize transportation and logistical challenges. Industry experts met there to begin the process of addressing the needs of this market segment.

Moving forward, the TLWG is now focusing on several key issues:

### Permitting harmonization

Manufactured components from one state are frequently delivered to projects in other states, and efficient transportation is hampered by differing state permitting rules for oversize, overweight loads. The following are examples of inefficiencies requiring resolution:

- These differences may be as small as different colored flagging required on loads.
- Permitting with small government entities (all wind farms are in rural locations): Most are small counties or townships with antiquated permit systems (in person/paper system).
- Permit inconsistencies: Permit applications are all different (some online, some fax, some e-mail) while certain states have very specific requirements.
- Permit errors: With no online application, the "back and forth" with permit applicants drastically increases permit lead times.
- Permitting in mass volumes: State permit systems are set up for heavy haul movement for single trips and not mass volumes on repetitive routes. Harmonizing permit rules among key states can reduce the time and cost of highway transportation.

## 2 TLWG Update

For the past several years, the Transportation Logistics Working Group has been engaged in promoting change in the harmonization of state regulatory transportation policies.

Over the past two years, the American Association of State Highway and Transportation Officials (AASHTO) set policy resolutions for Actions to Reduce Impediments to Interstate Commerce Harmonizing Requirements for Truck Permits. The first phase was to establish a truck oversize, overweight permit harmonization initiative to focus initially on the following requirement categories:

- Escort requirements
- Warning flags
- Warning lights
- Warning signs
- Days and hours of operation

Phase I recommendations were presented at the recent Specialized Carriers and Rigging Association Symposium (March 19-21, 2014) for additional industry input. States that are less restrictive are not expected to go backward, however it does give states that are more restrictive something to shoot for and provides a tool to support change efforts. The website for these projects is at: <http://highwaytransport.transportation.org/Pages/Harmonization.aspx>.

Phase Two of the Resolution is to continue the harmonization efforts and focus on the following:

- Number of valid days allowed on single trip permits
- Permit amendments
- Holiday restrictions
- Type and size of escort vehicles
- Escort requirements for overheight loads and overheight loads with other dimensions
- AASHTO member states are working through making the required changes per the resolution, and updates will be provided to the public shortly.

## 3 Driver shortage

The economics and aging of the driving work force has created a significant reduction in available trucks and drivers, and it is expected that the shortage will continue through the coming years as added regulatory requirements are being imposed on drivers and trucking companies. The TLWG devised a wide range of suggestions for addressing the driver shortage, including promoting the development of training programs, offering scholarships, and working to understand potential regulatory barriers.

## 4 Increasing the size of wind turbine components (blades, nacelles, tower sections)—manufacturers guide

Longer blades, heavier nacelles, and tower sections of greater diameter require advanced planning on a project-by-project basis and close cooperation between transportation and logistics providers and turbine manufacturers, as well as state and federal agencies. Transportation and third party logistics providers are looking to work more closely with manufacturers to ensure that efficient and cost-effective solutions are available.

To that end, the AWEA Transportation and Logistics Working Group is currently drafting an Original Equipment Manufacturers (OEM) Guide that will allow the research and development and engineering teams of turbine manufacturers to understand and work within existing transportation constraints. The primary projects of the working group to date include creating the OEM Guide and developing a relationship between AWEA and the American Association of State Highway and Transportation Officials (AASHTO) in order to work on harmonizing the permitting process across states.

## 5 Engineering logistics for optimized equipment utilization

While the manufacturing processes for wind turbine components have been effectively engineered, the logistics leg of the supply chain—i.e., origin manufacturing to pad site destination—is not always effectively or consistently considered or managed for optimized equipment utilization.

## 6 Multimodal Transportation

- Waterways - Waterways have played an increased role for wind energy component delivery using properly located ports, equipment capacity, and capabilities.
- Ports - Managing challenges such as sufficient laydown areas, infrastructure limitations, lifting and transfer requirements, and qualified labor, is part of a logistical strategy that has been developed to enable wind turbine components to be delivered safely through ports.
- Rail - Many of the same challenges affect the use of rail (sufficient laydown areas, lifting and transfer requirements, and qualified labor) and are being developed to provide the industry with a multi-modal solution.
- Green solutions - Developing a "green" supply chain solution for the wind energy industry involves developing a correlating proactive and consistent green logistics solution, factoring in all modes of transportation to create the most efficient and green end result.