Wind Pushing Future of Mechanical Components

Randy Stott, Managing Editor

The global wind power industry is BOOMING again.

After a sluggish 2013, annual installations of new wind turbines grew by 44% in 2014, according to the Global Wind Energy Council. And while much of that growth has been in Asia—particularly China, which now leads the world with 114 GW of installed capacity—the USA, Europe, and the rest of the world expect steady growth for the next couple of years as well (Fig. 1).

The Dry Lake Wind Power Project, online since 2009, was Arizona's first utility-scale wind farm (courtesy AWEA).

In the USA, of course, capital investment in wind energy projects is largely influenced by the infamous Production Tax Credit, which the U.S. government allowed to expire at the end of 2014. Despite that, the projects that began prior to the end of last year will keep the industry busy through 2015 and much of 2016.

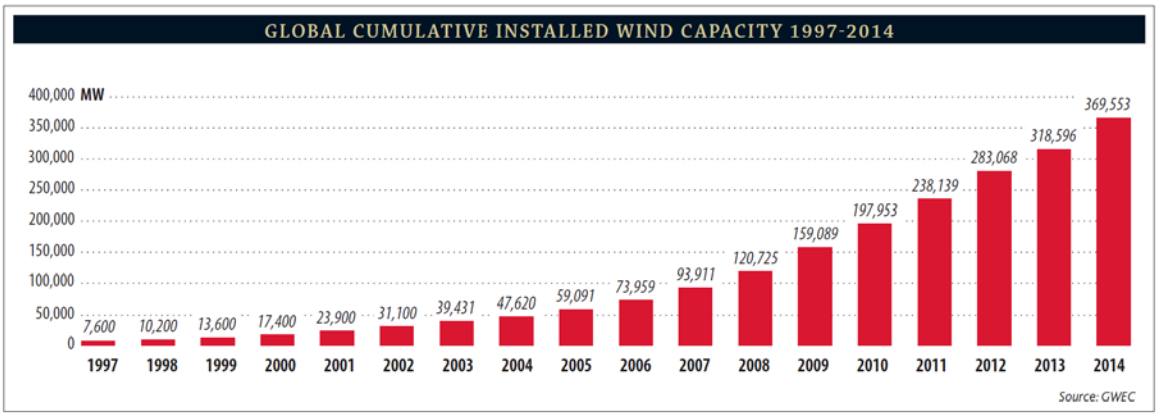

Figure 1 Growth in the global installed capacity of wind turbines (courtesy GWEC).

So there's still reason for optimism, especially if you're a supplier to the industry. Gear drives, bearings, couplings and related components not only help translate the power of wind into electricity, but they're also responsible for the many devices on wind turbines that help position the nacelle and blades to maximize productivity.

According to the American Wind Energy Association (AWEA), the U.S. wind-related manufacturing sector consists of more than 550 manufacturing facilities across 44 states, producing more than 8,000 components that comprise a typical wind turbine. U.S.-based facilities make everything from major components such as blades, towers, rotor hubs, generators and gearboxes, to internal components such as bearings, slip rings, brake systems, fasteners, power converters, sensors and control systems—reason enough for readers of *Power Transmission Engineering* to pay attention.

In fact, the AWEA says that over the past five years, new wind power project installations have grown at an average rate of 36% per year in the USA. This has allowed many U.S. manufacturers to get involved in the industry, bringing down the overall cost of a wind turbine and increasing the amount of U.S. manufactured content from less than 25% in 2005 to more than 67% today.

One of the best places to learn more about how you can get involved in the global wind turbine manufacturing industry is at the AWEA-sponsored Windpower 2015 Conference & Exhibition, which takes place May 18-21 in Orlan-

do, Florida. The annual event features major suppliers to the wind power industry, including many gearbox, bearing and other mechanical component providers (see sidebar for highlighted exhibitors from this year's show).

For example, the Schaeffler Group (Booth 2122) will present a number of the company's latest advances for wind turbines, including its FAG X-life cylindrical roller bearings for planetary gears, replace as well as the WiProM portable diagnostic tool, which offers the performance of a permanently mounted system in a rugged, portable unit.

WiProM is Schaeffler's new diagnostic tool for analyzing the performance of wind turbine components such as motors, gearboxes and generators.

Bonfiglioli's 700T Series planetary speed reducers are used by a number of leading wind turbine manufacturers for pitch and yaw control. The 700T are flange-mounted reducers with a torque range from 2,500 up to 300,000 N-m. They can be manufactured with three to five planetary reduction stages, providing ratios from 60 to 3,000 (Fig. 3).

Centa's Centalink couplings offer misalignment capability up to 2 degrees under rated operating conditions (and up to 6 degrees in exceptional cases). They are available for wind power applications from 6 to 50 kNm, and they're rated for temperatures from –45°C to 80°C.

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Figure 3 The 700T Series of gearboxes and gearmotors from Bonfiglioli is used for control of pitch and yaw in wind turbine applications.

In addition to the exposition, Windpower 2015 also offers educational opportunities in the accompanying conference. **PTE**

Windpower 2015
AWEA Windpower Conference & Exhibition 2015
Orange County Convention Center
Orlando, FL
May 18-21
www.windpowerexpo.org
Learn more about the show on AWEA's YouTube Channel at *www.youtube.com/user/americanwindenergy*

Featured Exhibitors:
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"Wind energy is growing throughout this country, but it's growing more in some parts of the country than others. In Florida, we think there's a great opportunity for more."
—Tom Kiernan, AWEA CEO

Expand Your Design Options with a Visit to Powdermet

By Randy Stott, Managing Editor

Powdermet 2015

MPIF/APMI International Conference on Powder Metallurgy & Particulate Materials

Hilton San Diego Bayfront Hotel
San Diego, CA
May 17-20
www.mpif.org

Many of the best applications for powder metallurgy (PM) are found in mechanical power transmission components. Every year, at the industry's annual conference, when the PM design awards are announced, the winning parts are often gears and transmission parts (Fig 1).

Because PM processes offer significant advantages over other metal forming and metal cutting operations, they are often ideally suited for mechanical parts. Those advantages include minimal material waste and the ability to form complex shapes, making them ideal candidates for many transmission parts.

The industry continues to make significant advancements in terms of part strength and finishing, and Powdermet is the place where industry experts gather to share and exchange knowledge. The conference includes more than 200 technical presentations from industry experts.

The educational sessions are supported by an exhibition featuring more than 100 booths. Exhibitors include leading suppliers of powder metallurgy and particulate materials and processing equipment, powders and related products.

Figure 1 Among the 2014 MPIF Design Excellence Award grand prize winners (pictured here) were an automotive transmission planetary carrier assembly and a dis-engagement mechanism for a snow-blower system. This year's winners will be announced at Powdermet 2015.

Figure 2 The sector gear and fixed ring shown here were winners of the 2014 MPIF Design Excellence Award of Distinction in the automotive transmission category. This year's winners will be announced at Powdermet 2015.