

The Global Gear Industry

INSIGHTS, PROJECTIONS, FACTS AND FIGURES

Jack McGuinn, Senior Editor



Gear science and manufacturing technology will play a key role in wind power technology's continued evolution and widespread acceptance. (Photos this page courtesy Siemens Corp.)

As reported in an April AP story, "A survey from the National Association for Business Economics finds that economists are hopeful that the broader economy is substantially improving, with rising employment reported for the fifth quarter in a row. The outlook for employment rose slightly, reaching a 12-year high," and "nearly all of the 72 economists surveyed—about 94 percent—now expect the economy to grow at least 2 percent in 2011."

U.S. firms cut 2.9 million domestic jobs while adding 2.4 million over-

seas, according to a recent *Wall Street Journal* report—"Big U.S. Firms Shift Hiring Abroad: Work Forces Shrink at Home." It goes on to state that in the last ten years, U.S. multinationals have cut 2.9 million American jobs, while hiring 2.4 million outside the United States.

The report notes that GE CEO Jeffrey Immelt explains the trends this way: "We've globalized around markets—not cheap labor. The era of globalization around cheap labor is over. Today we go to Brazil. We go to China. We go to India. Because that's

where the customers are."

In another published report, Bank of America Merrill Lynch economist Ethan Harris said the combination of supply chain problems and higher energy prices are bound to slow manufacturing growth in the months to come. At particular risk are automakers and electronics firms.

Lastly, but significantly, manufacturing's declining share of the U.S. economy over recent decades has reduced the pool of skilled workers available to fill jobs.

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Global demand for gears and gear assemblies is forecast to climb 4.7 percent annually through 2013 to \$169.5 billion.

Market gains will be driven by rising motor vehicle production, ongoing economic growth, increased manufacturing output and a shift in the product mix toward more expensive, energy-efficient units such as seven- and eight-speed automatic transmissions.

Strong demand in relatively small but fast-growing markets like wind and solar energy will also contribute to gear sales advances. Demand in developing parts of Asia, Eastern Europe, the Africa/Mideast region and Central and South America will outpace product sales in the United States, Western Europe and Japan.

Market gains in the developing world will be fueled by healthy economic growth, continuing industrialization efforts and climbing personal income levels, resulting in higher motor vehicle and other manufacturing output.

In addition, rising standards of living will help stimulate demand for motorcycles and other gear-containing durable goods, boosting both original equipment manufacturing and aftermarket gear sales. China and India will register some of the strongest market advances. China is expected to account for one-third of all additional gear demand through 2013 and will surpass Japan to become the second-largest national market behind the United States. By 2018, total gear sales in China will exceed product demand in the United States. Market growth is also expected to be healthy in Indonesia, Thailand, Iran and Russia.

Although advances will be less robust than in developing countries, gear product demand in the United States and Western Europe will increase as well—spurred by renewed strength in motor vehicle output following a period of decline. Gear sales in Japan—even prior to the recent trag-

ic events there—are predicted to slow noticeably, also negatively impacted by a drop in automotive industry production and continued sluggishness in capital equipment markets. Also prior to the disaster, Japan anticipated a more favorable outlook for machinery manufacturing to provide some impetus to growth, along with the large numbers of gear-containing equipment in use that would help support aftermarket gear demand. Only time will tell how that is resolved.

The global market for gears and gear assemblies is heavily reliant on the motor vehicle industry. In 2008, seven-tenths of all product sales were automotive related, with motor vehicle transmissions alone accounting for 45 percent of the entire gear market. Transmission demand will also grow at a faster rate than accessory, drive-line, steering and other motor vehicle gear sales through 2013, bolstered by an upturn in industry output in the United States, where more costly automatic transmissions are used in the vast majority of vehicles.

Average-per-vehicle transmission demand will also increase as these products become more complex and as medium- and heavy-vehicle output outpaces that of light vehicles.

Machinery will remain the second largest gear market, but will post somewhat slower gains. However, suppliers will benefit from industrialization activity in China and other developing areas, fueling demand for gears used in construction and manufacturing machinery.

Demand for gears used in all other applications—which include everything from aircraft and home appliances to motorcycles and solar energy systems—will expand more quickly than either motor vehicle- or machinery-related product sales. Advances will be driven by growth in global economic activity and higher income levels, boosting demand for a number of gear-containing products.

Sales of individual gears will rise somewhat faster than demand for gear assemblies, spurred by generally healthy aftermarket sales conditions. Growing demand for high-value individual gears, such as large-diameter units utilized in heavy machinery and

SUMMARY TABLE/ WORLD GEAR DEMAND (million dollars)						
Item	2003	2008	2013	2018	08/03	13/08
Gear Demand	97,850	134,500	169,500	217,000	6.6	4.7
North America:	29,900	32,650	40,450	48,800	1.8	4.4
United States	23,690	24,800	30,100	36,100	0.9	3.9
Canada & Mexico	6,210	7,850	10,350	12,700	4.8	5.7
Western Europe	27,200	32,150	36,200	41,100	3.4	2.4
Asia/Pacific:	30,900	51,100	68,350	94,600	10.6	6.0
China	6,720	17,250	28,900	45,600	20.7	10.9
Japan	15,200	19,500	19,800	21,900	5.1	0.3
Other Asia/Pacific	8,980	14,350	19,650	27,100	9.8	6.5
Central & South	2,910	5,500	7,090	9,340	13.6	5.2
Eastern Europe	4,670	8,850	11,800	15,700	13.6	5.9
Africa/Mideast	2,270	4,250	5,610	7,460	13.4	5.7

(Source: The Freedonia Group, Inc.)

wind turbines, will also help bolster overall dollar gains.

(The Freedonia Group is an international business research company that publishes more than 100 industry research studies annually, providing an unbiased outlook and reliable assessment of industries relative to product and market forecasts, industry

trends, threats and opportunities, competitive strategies and market share determinations. More than 90% of the industrial companies in the Fortune 500 use Freedonia research to help with their strategic planning.)

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**The Top 7
 Gear and Gear-Assembly
 Manufacturers**

1. General Motors (U.S.)
2. ZF Friedrichshafen (Germany)
3. Volkswagen (Germany)
4. Ford (U.S.)
5. Aisin Seiki (Japan)
6. Honda (Japan)
7. Toyota (Japan)

In 2008, five of the companies shown (chart) accounted for 31 percent of world gear demand. A significant slice of that pie is automotive-related (Source/Chart: The Freedonia Group.)

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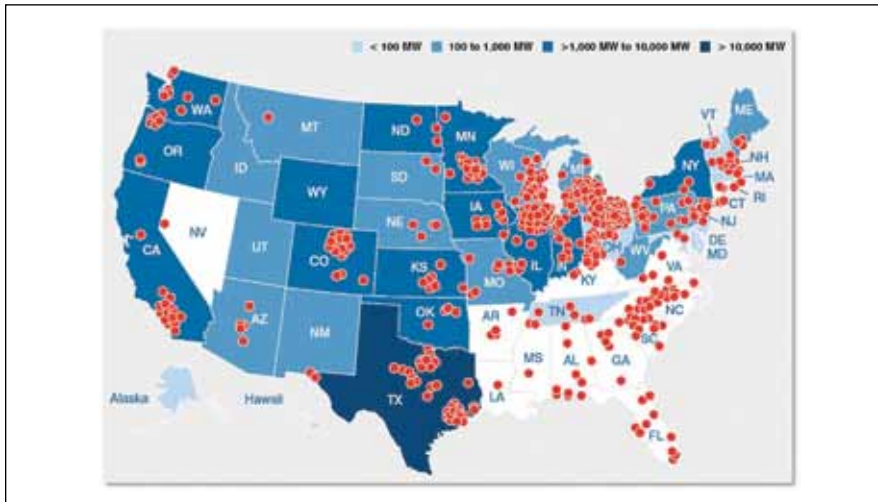
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U.S. Wind Industry Makes Gains Despite Economy and No National Energy Policy



A recent AWEA U.S. Wind Industry Annual Market Report for 2010 underscores wind's affordability as a domestic generation source. America's wind power industry grew by 15 percent in 2010 and provided 26 percent of all new electric generating capacity in the United States. With the 5,116 MW added last year, U.S. wind installations now stand at 40,181 MW, enough to

supply electricity for over 10 million American homes.

"The American wind industry is delivering, despite competing with energy sectors that have permanent government subsidies in place," says Denise Bode, CEO of the American Wind Energy Association (AWEA). "Wind is consistently performing," she goes on, "adding 35 percent of all new generat-

ing capacity since 2007. That's twice what coal and nuclear added combined."

Statistics from the April AWEA U.S. Wind Industry Annual Market Report, developed in conjunction with the AWEA Wind Power Finance and Investment Workshop in New York, reveal that wind continues to be an important player in the nation's energy sector, with lower costs competitive with other generation sources, and it's second in new generation capacity only to natural gas.

"It's simple—wind is affordable," says Elizabeth Salerno, director of data and analysis and chief economist for AWEA. "It's costing less than ever, and competing with other sources thanks to improved turbines built for better performance without a big price tag."

In addition to wind power's increased affordability, the 1603 investment tax credit program contributed to new project starts in 2010. On top of new construction starts, 2010 saw new manufacturing as well. A virtuous cycle was in play—manufacturers continued to respond to the demand and set up shop in the U.S. The indus-



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try brought 14 new manufacturing facilities online, consistent with 2009.

“Continued interest and investment by manufacturers in America demonstrates that the U.S. continues to be a global powerhouse for wind development—today and in the future,” says Bode. “With these new investments, wind energy is now up to 20,000 manufacturing jobs across 42 states.”

As for 2011, the U.S. wind market began with 5,600 MW under construction—more than twice the megawatts under construction at the start of 2010. The extension of the 1603 tax credit in December 2010 provided a signal to investors to continue growing wind in the U.S., as this strong performance indicates. “we remain on track to produce 20 percent of America’s electricity by 2030 with wind, as laid out by the Department of Energy during the Bush administration,” Bode continues. “We know wind is ready to deliver even more of our portfolio with clean, affordable, homegrown power.”

(Copyright 1996, 2011, American Wind Energy Association. All Rights Reserved. AWEA’s U.S. Wind Industry Annual Market Report is available to association members by logging on to the member center at awea.org. Non-members can purchase the report at the AWEA store.)

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Global player TÜV Rheinland’s Industrial Services division, a full-service inspection, testing and certification company providing both field and laboratory inspection services—including all NDT methods, QC/QA functions and material testing—has introduced a new emergency, rapid response service—

the Containment Emergency Response Team (C.E.R.T.). This specialized team has been assembled to quickly minimize OEM production disruptions when out-of-specification products have entered the supply chain.

C.E.R.T. is comprised of certified inspectors who are readily deployable nationally and internationally to respond to suspected quality issues throughout the supply chain. Using non-destructive testing techniques, the team provides rapid on-location inspec-

tion, sorting and containment services to quickly minimize the likelihood of faulty products causing production shutdowns.

According to Mark Forbes, laboratory sales manager for TÜV Rheinland Industrial Services, “While adhering to JIT and lean manufacturing principles can lower production costs, the necessitated minimal inventory volumes can magnify the cost of faulty products entering the supply chain. Often,

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a product defect is not discovered until well after the part is already on trailers, in transit, on the customer's floor or in assembled products on vehicles. Our team can travel to where the suspect products are located to provide on-site inspection, sorting and containment services to minimize possible production disruptions."

Continues Forbes, "As the recent Japanese earthquake and tsunami have shown, it can only take one missing component to quickly bring an entire production line to a halt. Our C.E.R.T. service can be thought of as the paramedics for the industrial world, quickly getting to the scene and applying on-site services to keep the production line moving."

C.E.R.T. inspectors are ASNT-TC-1A qualified using procedures from A2LA 17025:2005 laboratory accreditations. They are qualified in both laboratory and field services. TÜV is a Tier 1 NDT service provider to General Motors and performs inspections on parts for almost every auto manufacturer. The company is accredited to test to the Pressure Equipment Directive and has inspectors that can test to EN473 (European NDT standards).

Both laboratory and field-based inspection services are available in multiple industries, including: chemical, petrochemical, power generation, food processing, pulp and paper mills and general manufacturing. In addition, services are available to government agencies, storage facilities, architectural/engineering companies and education facilities.

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