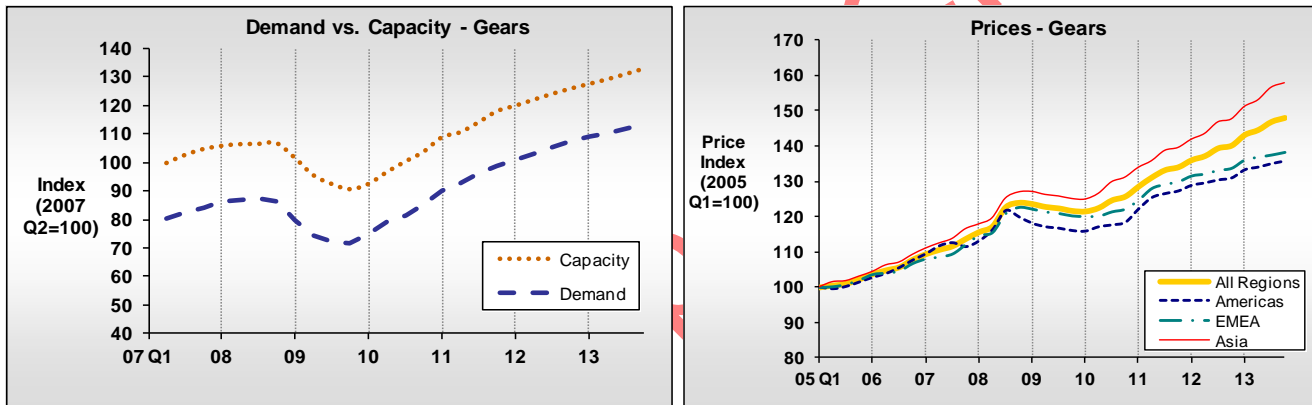


6 Gears

Sales rose 3.5% in Q3 on increased spending for high-speed gears for the power generation, oil & gas, and mining industries. Sales will increase 3% in Q4 and 14.7% by 2013, as oil & gas mining equipment purchases increase 7% and 28%, respectively. Utilization will decline slightly from 84% to 83.7% in Q4 as capacity additions outpace demand growth. Capacity utilization will rise incrementally before stabilizing at 85% in 2012. In Asia, metal costs rose 3%, production worker wages rose 3%, and engineer salaries rose 5.5% in Q3, contributing to a 1.5% global price increase. Gear prices will rise 0.6% in Q4, in line with inflation, as these rising labor costs in Asia will be partially offset by declining energy and metal costs. Prices will increase 4.5% in 2012 and 6% in 2013 as labor costs rise 10% annually in Asia and 2% in EMEA.

Figure 8: Key Indicators for Gears

Key Indicators	2011 Q4 - 2012 Q1	2011 Q4 - 2013 Q4
Demand	▲ 2.2%	▲ 14.7%
Order Lead Time	▲ 0.5%	▲ 0.3%
Prices	▲ 1.5%	▲ 10.4%
Capacity Utilization	▲ 0.5%	▲ 1.5%
Supplier Concentration	LO 0.3%	LO 2.4%



WEG acquired Watt Drive, an Austrian gear manufacturer, and formed a joint venture with Cestari Industrial, a Brazilian gear maker, to establish itself in the power transmissions business, and to allow it to offer complete drive and control systems. Japanese Sumitomo started assembling its Presto Neo parallel shaft gear motors in China, due to higher demand. ABB merged its US sales force with Baldor, and it will now have the broadest range of industrial drives and motors in the US market. Voith launched its power distribution gear, with an operating efficiency of 99%, compared to 98% in parallel shaft gears.

Figure 9: Top Gear Suppliers

	Name	Home Country	3-Year Annual Growth Rate	Power Transmission as a % of Sales	2010 Gear Revenues (\$M US)	R&D % of Sales 2010	Stock Price Change Last 90 Days	Q4 News
1	SEW	Germany	-7.2%	67%	\$1,006	N/A	N/A	Added capacity for industrial mining gears in Australia
2	Sumitomo	Japan	-8.8%	15%	\$809	1.5%	-18%	Opened \$73m facility in Brazil to boost regional sales
3	Siemens	Germany	-2.3%	<1%	\$747	5.1%	-22%	Announced first order for SGT-750 gas turbine
4	MAN	Germany	-4.6%	16%	\$496	2.5%	-1%	Renk orders up 25% YOY on turbo gear units in Q3
5	Rexnord	USA	-5.2%	72%	\$429	N/A	N/A	Received final funding for US factory expansion
6	Nord	Germany	2.1%	80%	\$280	N/A	N/A	Investing \$2.8m to expand factory in Wisconsin, US
7	MHI	Japan	-1.1%	<1%	\$263	2.0%	-14%	Received order for a 1.6 GW GTCC plant in Thailand
8	Lufkin	USA	-6.7%	21%	\$138	N/A	31%	10% price hike in 2011 to regain pre-2008 margins
9	Emerson	USA	-7.9%	2%	\$127	2.2%	-10%	N/A
10	ABB	Japan	-4.9%	<1%	\$106	3.4%	-21%	Merged US marketing with Baldor to harvest synergies

6.1 Sourcing Recommendations – Gears:

1. Source gears from manufacturers like Voith Turbo, Flender-Graffenstaden, and Amarillo Gear LLC whose prices will remain steady in 2012 in comparison to Philadelphia Gear, who will raise prices over the next two years, and Lufkin, whose 10% price increases in 2011 will begin to reflect in 2012 Q1.
2. Include WEG with Siemens, ABB, MHI, and Emerson, in bids for projects that require the supply of complete drive and control systems that include electric motors, frequency inverters, and gearboxes. WEG is the number five supplier of electric motors, and has recently entered into the gearing and power transmission industry through various mergers and acquisitions.
3. Buy Voith Turbo BHS's power distribution gear for use in future projects that require the high-power high-speed functionality of parallel shaft gears, such as gas-turbine to compressor applications. The power distribution gear can transmit up to 65 MW of power and has an operating efficiency of 99%, compared to 26 MW of power and 98% operating efficiency for a parallel shaft gear unit in the same application.

6.2 Sales will grow 3% in Q4 on a 4% increase in oil & gas and mining industry spending, and a 5% increase in demand for engines and turbines.

Demand for Gears rose 3.5% in Q3 on orders from the power generation, mining, and plastics industries. The most impactful driver of growth was high-speed gearing for wind turbines and oil & gas applications. Asia and EMEA led demand with growth at 4% and 3.5%, respectively, as the offshore wind sector of both regions saw increased activity in 2011. UK wind farm operators built or gained consent for the construction of wind farms with 3.3 GW of generating capacity, while China began the tendering process for 2.5-3 GW of offshore concession projects. Demand grew 1.4% in the Americas, an improvement from Q2 when the sales level remained unchanged.

Gear sales will rise 3% in Q4 primarily due to an increase in orders for wind turbines. In the US, the ratio of electricity generated by wind power has reached 20% in South Dakota and Iowa, and construction is already underway to increase the country's total electricity from wind by 7.4 GW in 2011. Of the different types of gears, planetary, helical, and worm gears are best suited for use in wind turbines.

- Duke Energy Corporation ordered a total of 174 wind turbines for a range of projects in the US. The turbines will be used at sites in Kansas, Pennsylvania, and Texas.
- Hydro Tasmania ordered 56 V90-3.0 MW wind turbines to be installed at its 168 MW Musselroe wind farm in Hobart, Australia. The gear unit in these turbines is a combination of a two-stage planetary gear and a one-stage helical gear.
- Sterling Agro Group, Gujarat Power Corporation, Rajasthan Gums, and Malpani Group all placed orders for Suzlon's S82-1.5 MW and S88-2.1 MW wind turbines. The S82 turbine is designed with a three-stage (one planetary and two spur gears) gearbox, while the S88 turbine is designed with a three-stage (one planetary and two helical gears) gearbox.

reduction gears and 12 weeks for its double reduction gears. Philadelphia Gear's API 677 standard products have lead times that range from 8-16 weeks.

For API 613 specialized gears, lead times will average 32 weeks in Q4, with forgings as the primary bottleneck in the process.

- Flender-Graffenstaden requires 20 weeks to manufacture its 8 MW API 613 specialized gearboxes, and 40-48 weeks for its 100 MW API 613 specialized gearboxes.
- MAN's lead times range from 24-32 weeks for its customized gears.
- The lead time on Vorecon, Voith Turbo's API 613 variable-speed planetary gear is about 32 weeks. For the upgraded Vorecon M+ gear, the lead time doubles (up to 64 weeks), while for a complete drive system that includes the Vorecon gear and a motor, the lead time increases by 50% (up to 48 weeks).

Lead times will rise (imperceptibly) in 2012 Q1 on minor changes in backlogs and spare capacity. Capacity margin will shrink 1.5%, and industry backlog increase 1.4%.

Lead times for standard API 677 gear units will stabilize at 11.7 weeks in 2012, and will decline only marginally to 11.6 weeks in 2013, as industry backlogs drop 4.6% and capacity margins increase 5%. However, for API 613 specialized gears, Voith and Flender-Graffenstaden have both expressed concerns that the lead times for these units will increase in the long term. At Voith, current automation measures will only help to manage lead times to some extent because of the need to move between single-part manufacturing and series production for spare parts.

