Turbines in China

Industry Study with Forecasts for 2011 & 2016

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Demand to grow 8.4% annually through 2011

Demand for turbines in China is expected to advance 8.4 percent per annum through 2011 to ¥106.5 billion. Market advances will be stimulated by growth in utilities construction spending, particularly on electricity generation, and increasing expenditures on air carrier services. Growing manufacturing production and government concerns about energy efficiency will also bolster investment in cogeneration facility construction in China.

Wind turbine demand to outpace dominant steam turbine segment

Demand for steam turbines, the largest product segment, will decline by 2011 based on a slowdown in new electricity generation capacity following large scale power plant construction over the past five years. However, sales will be supported by the low cost, high efficiency and ease of installation of steam turbines. Government efforts to close small coal-fired power plants and to build electric utilities with large output capacities will also help support demand for steam turbines over the forecast period. Demand gains for wind turbines will grow faster than for steam turbines, boosted by government encouragement of clean energy sources and the abundance of sites with suitable wind conditions in China. Sales of turbine engines will be supported by a healthy airplane maintenance/repair/operation (MRO) industry in China, as well as higher personal income levels, which are increasing air travel.

Aerospace to be fastest growing application

The electric utilities market will continue to be the largest user of turbines due to the wide range of turbine applications in electric power generation. Strong expansion of the Chinese manufacturing industry and improving living standards are driving demand for electricity in China, requiring the construction of new power plants. However, electricity generation capacity additions, and associated turbine sales, are expected to moderate with the correction of recent electrical power capacity shortages. Improvements in the efficiency of energy use as well as upgrades to the national grid and other transmission networks will also limit the construction of new power generation facilities in China going forward. Sales of turbines used in aerospace applications are expected to see the fastest growth, benefiting from an increasing demand for civil and military aircraft, and by government development of a domestic producer of commercial aircraft. Compared with the aerospace market, process manufacturing and other turbine applications are expected to see below-average gains through 2011.
Demand for turbofan engines in China is forecast to increase over 18 percent annually to ¥10.7 billion in 2011. Gains will be driven by the increasing number of airplanes in use in China, which will drive demand in MRO applications. The planned production of commercial airplanes in China will also support turbine sales at the original equipment level.

Turbofan engines create the thrust required for flight by the integration of three major components: a fan, a compressor-combustor-turbine unit (referred to as the core) and a power turbine. First, air flows through the fan. Some of that air flows around the core and out the exit nozzles, creating thrust just like a propeller. The rest flows into the core, where it is mixed with other gases in the compressor and then combusted to create a high-energy hot gas. This gas fuels the power turbine’s rotation, creating the rest of the thrust required for flight.

All of the jet engines that power current generation commercial jet aircraft are turbofans, which are used because they are highly efficient and relatively quiet in operation. Turbofans are also used in some military jet aircraft when high speeds and lower weights are not required. Turbofans are also considered to be less environmentally damaging than other engine types.

The turbofan engine market is dominated by GE (US), Rolls-Royce (UK) and Pratt & Whitney (US). Nevertheless, Chinese companies, such as Shenyang Liming Aero-Engine and Xi’an Aero-Engine, will expand their production capacity and increase market share going forward.

**TABLE III-1**

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**CHART VI-1**

**TURBINE MARKET SHARE IN CHINA BY COMPANY, 2006**

("¥71.1 billion")

- GE
- Rolls-Royce
- others 59.4%
China Chang Jiang Energy Corporation (CCJEC) is a state-owned enterprise that manufactures power generation equipment. The Company also provides related services for the construction of power stations.

The Company is active in the Chinese turbine industry through the production of such power generation equipment as steam and hydraulic turbines, turbine generators, and turbine generator sets. CCJEC’s steam turbines are available in extraction, extraction back-pressure, condensing and back-pressure styles, featuring over 110 different models with output capacities ranging from 1 to 200 megawatts (MW). Hydraulic turbines encompass custom and standard models, including impulse, tubular, Francis and Kaplan varieties. The Company’s range of steam turbine generators comprises QF series air cooled units; and QFQ, QFQN and QFSN series hydrogen-cooled models.

According to CCJEC, it has an annual production capacity of more than 2,000 units of power equipment. Many of the Company’s

“Demand for steam turbines in China is projected to decrease 2.6 percent annually through 2011 to ¥20.5 billion. This decline will result mainly from the high levels of expansion efforts in electricity generation capacity during the 2003-2005 period, which were undertaken to address power shortage problems in some of the more developed regions in China ... Following this short burst of rapid capacity expansion, as well as upgrades to electricity distribution networks and anticipated improvements in energy efficiency, demand for steam turbines is expected to decline going forward.”

--Section III, pg. 60
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Other Studies

World Batteries
This study analyzes the global battery industry. It presents historical demand data for the years 1997, 2002 and 2007 and forecasts for 2012 and 2017 by battery product (e.g., alkaline, zinc-carbon/zinc-chloride, lithium, lead-acid, nickel-based); market (e.g., consumer, automotive, industrial); world region and major national markets. The study also considers market environment factors, details industry structure, evaluates company market share and profiles leading battery manufacturers worldwide.

Machine Tools in China
This study presents historical Chinese demand data (1997, 2002, 2007) and forecasts for 2012 and 2017 by machine tool product (metal cutting, metal forming, nonmetal machine tools, machine tool accessories); market (e.g., industrial machinery and equipment, transportation equipment, primary and fabricated metals, electrical and electronic equipment); and region (e.g., Central-North, Central-East). The study also considers market environment factors, profile industry participants and evaluates market share.

Industrial Valves in China
This study analyzes the Chinese market for industrial valves, the fastest growing among the major economies. It presents historical demand data (1996, 2001, 2006) and forecasts for 2011 and 2016 by valve type (e.g., application-specific, quarterturn, multiturn, safety and relief, control, regulator, automatic actuators); market (e.g., process manufacturing, utilities, resource extraction industries, construction); and by region (e.g., Central-North, Central-East). The study also details market share and profiles major players.

World Pumps
Global demand for fluid handling pumps will increase 4.4% annually through 2012. Developing areas such as China and India will offer strong growth prospects. Centrifugal pumps will remain the largest type, while diaphragm and turbine pumps will post more rapid gains. Utilities will exhibit the fastest growth among the major pump markets. This study analyzes the world pumps industry, with forecasts for 2012 and 2017 by type, market, world region and for 35 countries. It also details market share and profiles industry players.

World Electric Power Equipment
World electric transmission and distribution equipment demand will rise 4.4% annually through 2011. The industrial and commercial sector will see the strongest gains as cogeneration proliferates and products such as high voltage transformers become more common outside of the utility sector. This study analyzes the $85 billion world electric power equipment industry, with forecasts for 2011 and 2016 by product, market, world region and for 17 countries. It also details market share and profiles major players.

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