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# **Major Power Equipment Competition and Exports Study**

**Project No. 09-771-640002**

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## INTRODUCTION

This study assesses the manufacturing capabilities and global competitiveness in exports by US manufacturers of power-sector equipment. Exhibit 1 provides the nomenclature of these types of equipment as referenced in the U.S. government classification systems.

### Exhibit 1 - Trade Classification of Major Power Equipment

Classification System	Classification Number	Description
<b>Data available in full report</b>		

Exhibit 2 below provides the approximate breakdown and average ranges for major equipment.

### Exhibit 2 - Power Plant Cost Estimate Breakdown (%)

Major Cost Component	Combined Cycle Power Plant	Coal Power Plant
<b>Data available in full report</b>		

Source: <>

The choice of major equipment for this industry analysis represents up to 50% of the power plant cost. Power plant cost varies significantly based on the location and technology selected. Combined-cycle power plant cost can be normally estimated in the \$<>/kW range, while state-of-the art supercritical coal technology would be in the \$<>/kW range. This translates to about \$<> million for the gas turbine equipment for <> MW combined cycle power plant constructed at \$<>/kW cost. The Heat Recovery Steam Generator (Boiler) for such a plant will cost about \$<> million, and the steam turbine will cost about \$<> million.

## WORLD POWER DEVELOPMENT TRENDS

Exhibit 3 shows that the world conventional electricity generating capacity grew on average at <>% over last <> years. The Middle East, North & South America and Asia regions clearly led this growth, while Europe (i.e. Eastern Europe) and Eurasia in general showed low growth. This is primarily explained by low level of economic development that has taken place in the NIS (Newly Independent States) region as well as a result of regional instability.

**Exhibit 3 - Global Changes in Thermal Electricity Installed Capacity (MW) and Economic Growth** (For selected countries only)

Region/Country	Capacity 1990 to	2000 to
Mexico		
United States		
<b>North America</b>		
<b>Central &amp; South America</b>		
Croatia		
Czech Republic		
Hungary		
Poland		
Slovenia		
<b>Europe</b>		
Armenia		
Azerbaijan		
Moldova		
Russia		
Turkmenistan		
<b>Eurasia</b>		
Israel		
Jordan		
Kuwait		
Oman		
Qatar		
Saudi Arabia		
United Arab Emirates		
<b>Middle East</b>		
<b>Africa</b>		
Bangladesh		
China		
India		
Indonesia		
Korea, South		
Philippines		
Singapore		
Taiwan		
Thailand		
Vietnam		
<b>Asia &amp; Oceania</b>		
<b>World Total</b>		

**Data available in full report**

Source: <>

In the last <> years, capacity additions in conventional fossil-fuel fired electricity generation has seen primarily the addition of gas-turbine-based capacity including simple cycle and combined cycle gas turbine plants. Next in capacity additions have been new coal-fired and other fossil-fuel fired thermal plants, as well as completion of unfinished plants started some years ago. Very few advanced clean-coal thermal power projects (such as Integrated Gasification Combined-Cycle (IGCC) or Circulating Fluidized Bed (CFB)), or Ultra Supercritical Units have been implemented in last <> years.

It should be noted that both countries with the electricity sector operating in a free market environment, (such as Croatia, Singapore, Philippines, and Taiwan), as well as countries representing an electricity market under government control (such as China, Saudi Arabia, South Korea), have shown significant market growth rates. Economic development, represented by indicators such as growth in GDP, is a major driver of generating capacity addition decisions and electric system development.

## **MAIN WORLDWIDE INDUSTRY PLAYERS**

Rating agencies and financial institutions classify major power equipment under the Industrial Machinery category. Exhibit 4 below shows the largest manufacturers by country of origin and revenues in the industrial machinery segments of economic activity. It should be noted that the industrial machinery category also includes non-power related equipment, such as automation equipment, industrial manufacturing equipment, and others.

### **Exhibit 4 - Leading Global Providers of Industrial Machinery**



Source: <>

Concerning the ranking of industrial machinery providers shown in Exhibit 4, above, it is worth noting that the industrial machinery sector is very nontransparent and fragmented, as well as being driven by a few of the largest players. For example, the three largest manufacturers represent as much of the market as the next 20 companies.

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Looking further into the market that concerns power equipment manufacturers, Exhibit 5 lists principal power equipment categories as well as the major U.S. and international players.

**Exhibit 5 – Major U.S. and International Equipment Manufacturers**

Product Category	Company	Country	Equipment Size
Gas Turbines	<b>Data available in full report</b>		
Steam Turbines (non-nuclear)			
Steam Boilers			

Source: <>

**U.S. MAJOR POWER EQUIPMENT EXPORTS**

<>  
<>

Exhibit 6 shows U.S. exports of major power equipment by country. Consultants focused on middle- and low- income countries.

**Major Power Equipment Competition and Exports Study**

**Exhibit 6 - U.S. Exports to Selected Country (\$ million)**

**(a) 8411 - Gas Turbines**

	2001	2002	2003	2004	2005	2006	5-Yr Increase	5-Yr Growth
<b>World Total</b>	17							
Mexico								
South Korea								
China								
Saudi Arabia								
India								
Taiwan								
United Arab Emirates								
Malaysia								
Israel								
Hungary								
Poland								
Thailand								
Indonesia								
Romania								
Czech Republic								
Oman								
Viet Nam								

**(b) 8406 - Steam Turbines**

**World Total**

- China
- Mexico
- South Korea
- Singapore
- Saudi Arabia
- India
- Indonesia
- Taiwan
- Qatar
- Thailand
- Hong Kong
- Malaysia

**Data available in full report**

**(c) 8406 - Steam Boilers**

**World Total**

- China
- Mexico
- Indonesia
- Saudi Arabia
- India
- Thailand
- South Korea
- Malaysia
- Taiwan

Source: <>

## U.S. AUXILIARY POWER EQUIPMENT AND SERVICES EXPORTS

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## U.S. MANUFACTURING CAPABILITIES FOR POWER EQUIPMENT

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### Exhibit 8 - Equipment Manufacturing Sourcing and Target Markets

Company	Main and Foreign Manufacturing Subsidiaries	Products Produced	Markets Served
<p><b>Data available in full report</b></p>			
	China		

Source: <>

## BARRIERS TO US EXPORTS



◇  
**WORLDWIDE COMPETITIVENESS U.S. POWER INDUSTRY**

<>  
**Exhibit 9 - Equipment Supply Track Record**

Company	Equipment Type	Major orders won from
C		
F		
F		
E C		
N		

**Data available in full report**

Source: <>

It should be noted that companies in general do not publish or disclose unsuccessful bids. At the same time, during the discussions, many industry specialists have made a statement that marketing efforts are directed primarily toward markets, where levels of purchasing activity are above average. These markets are typically identified by the companies themselves. For example, General Electric identifies its most promising markets as shown on Exhibit 9 below. In General Electric's opinion, the most marketing efforts will be directed toward Asia, Europe, and Middle East.

**Exhibit 10 - Markets Size Estimate by GE Energy**



<>

Overall U.S. equipment manufacturing companies' competitiveness can be assessed in the following terms:

- **New Orders as % of Revenues (Sales)** - Generally, new orders ratio for all companies is in the range of <>...
- **Profit Margin as % of Revenues (Sales)** - Overall, most of the US companies show a <>...

Exhibit 10 - Leading Equipment Manufacturers (FY2009, \$billion)

Company	Division Name	New Orders	Revenues (Sales)	Profit
C	<b>Data available in full report</b>			
S				
f				
E				
A				
N				
I				
A				
U				
F				
N	Company - Power			

Source: <>

<>

Exhibit 11 -Gas Turbines Market Overview

<b>Data available in full report</b>
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It is difficult to estimate what market share U.S. manufacturers hold in the gas turbine market. However, based on the information above and assuming <>...

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