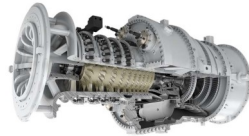


# Steam and Gas Turbine Report Ed1 2018



Steam turbines and gas turbines occupy parallel but different market segments. The turbine market will grow at a cagr of 4.4%, due to the continued increase in coal-fired and gas-fired power capacity, industrial expansion in the developing world and tightening AQ controls. China and India are pruning back on new coal-fired plants, but they are not stopping. Turkey, Indonesia and Bangladesh are going large on coal, and the United States is up-grading large chunks of its big coal-fired fleet to supercritical technology. This activity means more, advanced class steam turbines. Developments of gas turbines are expected in China.

## Highlights.

- Market estimates and forecasts of sales of steam turbines and gas turbines in \$ to 2022.
- About half the population of each type of turbine is used in power generation - half in oil & gas, industry and marine - with aviation using aeroderivative GTs.
- China produces over half the world's steam turbines, with Shanghai Electric, Dongfang and Harbin Electric the global leaders.
- GE and Siemens dominate the GT market, but new threats to their dominance are emerging.
- Production and off-take of GTs have lagged far behind in China, because of the supremacy of coal. This is changing as the country expands its relatively small gas share. Shanghai Electric and Harbin have already bought into GT technology with acquisitions and partnerships.
- Mergers and acquisitions are described and newcomers are flagged.
- There have been significant advances in turbine technologies, with G- and H-class STs and GTs meeting supercritical criteria of higher temperature and pressure. This has eroded the long-held dominance of F-class turbines and G- and H-class turbines are growing their shares.
- To meet energy and environmental conservation targets, efficiency is the dominant criterion for turbines today.
- Unexpectedly, instead of closing down inefficient coal power plants, many US owners have been converting them to supercritical base-load plants with G-or H-class turbines.
- Despite the rise of the advanced G- and H-class turbines, the long established F-class retains popularity among a segment of owners, as a well-established, proven performer, suitable for plants up to 500 MW.
- Aeroderivative turbines have been used for peaking but substantial new improvements in start-up times and ramp rates are making frame turbines more competitive for peaking.

## Steam and Gas Turbine Report Ed1 2018

The following companies feature in the report, with separate profiles and as participants in an extensive section detailing mergers, acquisitions and partnerships: GE, Siemens, Alstom, MHPS (Mitsubishi Hitachi Power Systems), Toshiba, Doosan, Ansaldo Energia, Rolls-Royce, Dresser-Rand, BHEL, Shanghai Electric, Harbin Electric, Dongfang and Hangzhou Electric.

StatPlan reports have been purchased or studies commissioned by Siemens, ABB, BASF, GE, Schneider Electrical, Reinhausen Maschinenfabriken, Toshiba, Hitachi, Thyssen, Softbank, Rolls-Royce, Babcock, Nanoelectro and Reuters, among others.

The research for this report was carried out with extensive desk research and reference to StatPlan's own databases, together with interviews conducted with industry executives in the United States, Europe and China.

56 pages.

Price of the PDF report : GBP 800 / USD 1,050.

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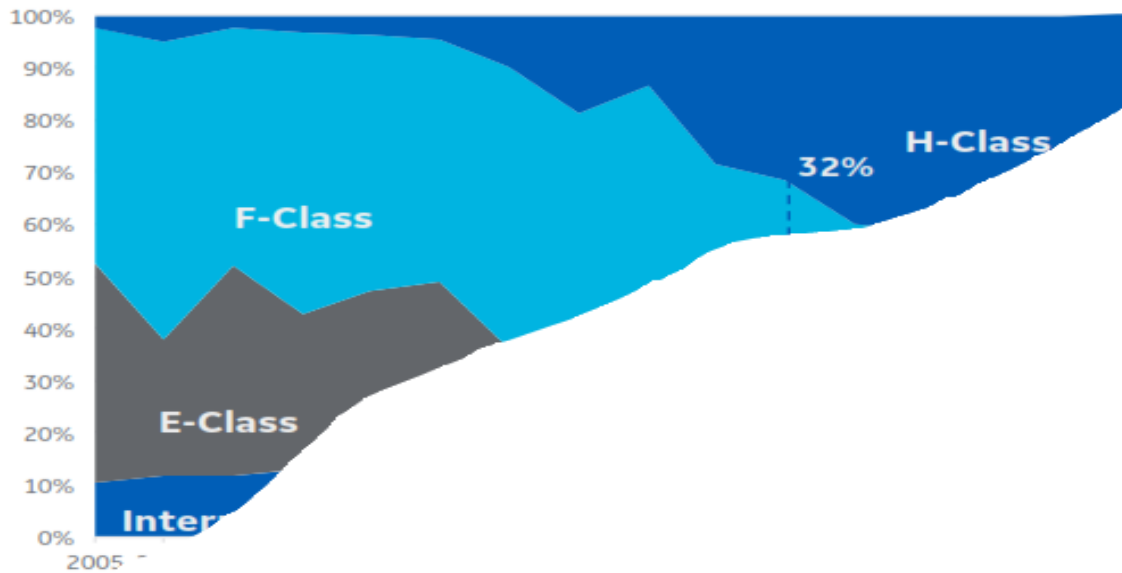
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Excerpts from Sample Pages

## Industry dynamics, E-class to H-class – Gas Turbines > 40 MW



### Aeroderivative versus frame GTs

Aero and aeroderivative gas turbine engines are likely to be built in modular construction. This means that one module of the gas turbine engine may be removed from service and the other modules left in place. A substitute module may be inserted in place of the removed module so the gas turbine can resume service. A frame engine is more likely to be constructed in a non-modular format. If part of a frame engine has serious problems, it is likely that the entire engine will be down for maintenance.

Across power markets, there are needs for new peaking capacity, and all markets value the main characteristics of a peaking facility; quick start/ramp rate, emissions compliance, flexible operation, and output. Historically, aeroderivative gas turbines have been the mainstay of the peaking market, with characteristics that match the demands. With the advancements in frame machine technology and the projections of low gas prices, this not be so clear cut anymore.

Peaking plants are valued .....

## Steam and Gas Turbine Report Ed1 2018

### MARKET SIZE AND MARKET SHARES

Turbine sales are estimated at \$XX billion in 2018, rising at a cagr of XX% to \$XX billion in nominal values in 2022. Steam turbines will amount to \$XX billion in 2018 and gas turbines \$XX billion. STs will rise at a cagr of XX% to \$XX billion in 2022 and GTs at a cagr of XX% to \$XX billion.

The ST market, although larger than GTs, is being affected by government policies to cut down on coal generation, notably in China and India, to meet environmental targets.

**Table 3: Turbine sales in nominal \$ million, 2018 to 2022**

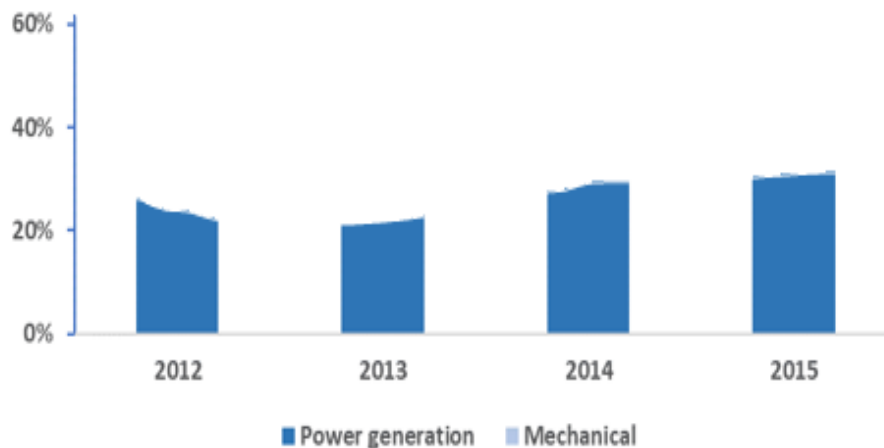
	2018	2019	2020	2021	2022	cagr
Steam turbines						
Gas turbines						
All turbines						

### End users

The industry reports for turbines and reciprocating engine orders worldwide, excluding Chinese companies, have recorded a steady increase on the proportion of orders for power generation and a decline in the proportion for mechanical drive. Although both categories have demonstrated a lot of lumpiness and have fluctuated a great deal, this has been driven more by the greater increase in the volume of capacity for power generation than for mechanical drive.

The category of power generation includes all producers of power; utilities, merchant and industrial generators. The figures do not, therefore, reflect a break of utilities versus industry, since industry uses turbines for both power generation and mechanical drive for industrial process.

**Figure 5: Proportions of turbine capacity for power generation and mechanical drive, by output capacity in MW**

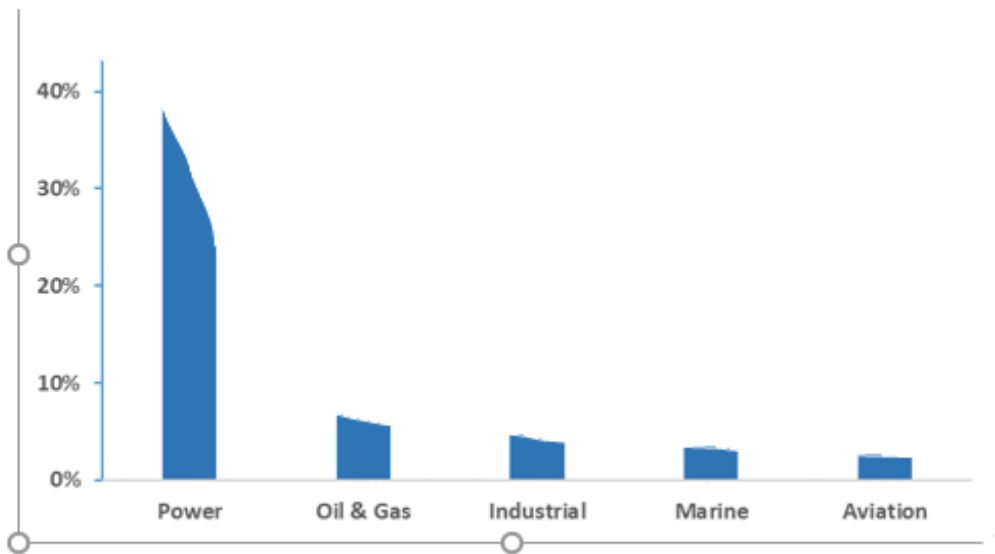




## Steam and Gas Turbine Report Ed1 2018

In the following figure, power generation refers to utility generation. The other four categories, Oil & Gas, Industry, Marine and Aviation include both power generation and mechanical drive.

**Figure 6: Gas and steam turbine shares of end-users**



Source: Company reports and StatPlan estimates

### Market shares

#### Steam turbines

China has XX% of the world's installed coal generating capacity, compared with only XX% of global gas capacity. This has led to China's leading position as a manufacturer of steam turbines, with about half the world's ST production, but a much smaller share of gas turbine production. The steam turbine market in China is dominated by three major manufacturers; Shanghai Electric Group, China Dongfang Electric Corporation, and Harbin Electric Co, which account for over 80% of the total steam turbine production in China.

GE steam turbines equip XX% of the world's combined-cycle plants, XX% of fossil power plants, and XX% of the world's nuclear power plants. This has been increased with the Alstom base of XX GW of steam turbine capacity. This GE figure .....

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