

POWER SYSTEMS

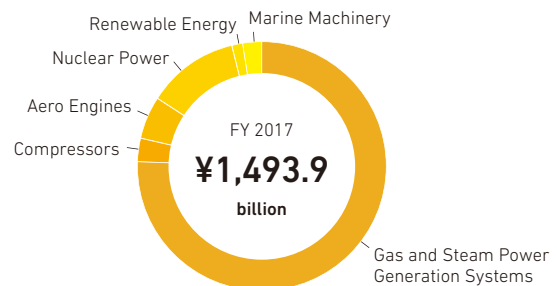
The Power Systems is supporting power supply throughout the world by offering a variety of energy solutions, including environmentally friendly gas turbine combined-cycle (GTCC) systems, geothermal and wind power generation, nuclear power generation that can be used as a baseload power and does not emit CO₂, and gas and steam power generation that can be stably supplied with superior economic efficiency. Additionally, we manufacture compressors for use in fertilizer plants that are indispensable in solving food issues, and engines for commercial aircraft that support comfortable travel. We are a Power & Energy Solution Provider that responds to social progress and diverse needs by offering new products created through solution proposals and turbomachinery synergies, along with our advancing and improving core machineries.

Operating Environment and Addressing Social Issues

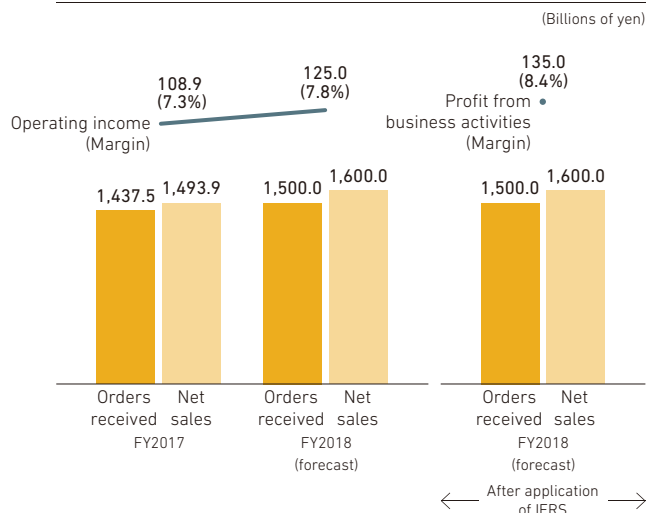
MHI believes that electric power demand will expand even further as electrification progresses, due to phenomena such as economic development in emerging countries and the spread of electric vehicles. At the same time, global warming is expected to spur movement toward low-carbon and carbon-free energy.

Geographic, economic, and social conditions differ depending on country and region, so it is important to offer power sources that correspond to these diverse needs. Demand for renewable energy, such as wind power, is continuously increasing. Simultaneously, we can see a growing need for supply and demand load regulation systems and energy storage systems that secure necessary stabilization of electric power sources and address requirements for improved generation efficiency and lower generating costs.

Net Sales by Core Business*



Operating Performance*



*Results for our affiliate MHI Vestas Offshore Wind A/S (MVOW), which deals in offshore wind power systems, are not included in this graph because the company is accounted for using the equity method.

S		
Strengths	Gas and Steam Power	<ul style="list-style-type: none"> • Systems offering world's highest levels of thermal efficiency and output • A full range of output levels, from small and medium-sized to large • State-of-the-art environmental technologies (AQCS,*1 IGCC*2)
	Nuclear Power	<ul style="list-style-type: none"> • Highest levels in the world in safety technologies and product quality
	Renewable Energy	<ul style="list-style-type: none"> • Extensive track record in offshore wind turbines (second-largest share of the world market) and launch of a 9.5 MW, high-output offshore wind turbine (MVOW)
	Aero Engines	<ul style="list-style-type: none"> • Combustor and low-pressure turbine manufacturing techniques amassed over many years
	Compressors	<ul style="list-style-type: none"> • Top share of the market in the chemical plant field
	Marine Machinery	<ul style="list-style-type: none"> • Flexible customization and the ability to provide solutions
	Turbomachinery Synergies	<ul style="list-style-type: none"> • Mutual use of technologies, human resources, and facilities • Gas turbines, aero engines, aero-derivative gas turbines [PWPS*3], compressors, pumps, MET turbochargers, organic Rankine cycle [Turboden]
<small>*1 AQCS: Air Quality Control System *2 IGCC: Integrated coal Gasification Combined Cycle *3 PWPS: PW Power Systems</small>		
W		
Weaknesses	Gas and Steam Power	<ul style="list-style-type: none"> • Limited track record for delivery of aftermarket services
	Nuclear Power	<ul style="list-style-type: none"> • Little experience in constructing new plants overseas
	Renewable Energy	<ul style="list-style-type: none"> • Limited lineup
	Aero Engines	<ul style="list-style-type: none"> • Market led by European and US engine manufacturers
	Compressors	<ul style="list-style-type: none"> • Track record in the oil and gas market
	Marine Machinery	<ul style="list-style-type: none"> • Global service network
O		
Opportunities	Gas and Steam Power	<ul style="list-style-type: none"> • Need for high-efficiency, green power generation in line with increasingly stringent environmental regulations • Need for supply and demand adjustments in accordance with the expansion of renewable energy
	Nuclear Power	<ul style="list-style-type: none"> • Introduction and expansion of new generation capacity, mainly in emerging markets in anticipation of upcoming carbon-free societies
	Renewable Energy	<ul style="list-style-type: none"> • Growing demand for offshore wind turbines (markets are expanding in Europe, the U.S., Taiwan, and Japan)
	Aero Engines	<ul style="list-style-type: none"> • Sustained growth in the airplane market
	Compressors	<ul style="list-style-type: none"> • Increasingly vigorous oil and gas markets
	Marine Machinery	<ul style="list-style-type: none"> • Strengthened environmental regulations
T		
Threats	Gas and Steam Power	<ul style="list-style-type: none"> • Increasingly stringent competition with overseas companies • Expanded use of renewable energy and backlash against coal-fired thermal power
	Nuclear Power	<ul style="list-style-type: none"> • Trend away from nuclear power generation
	Renewable Energy	<ul style="list-style-type: none"> • Market susceptible to policy-driven subsidy trends
	Aero Engines	<ul style="list-style-type: none"> • Aircraft component business changing due to technological innovation
	Compressors	<ul style="list-style-type: none"> • Delayed recovery in the oil and gas market, increasingly severe competition
	Marine Machinery	<ul style="list-style-type: none"> • Long slump in the maritime transport and shipbuilding industries

The Value We Deliver

MHI Group provides stable electrical power with superior economic efficiency and offers solutions that allow for both societal development and comfortable livelihoods. We do this by promoting a harmonious coexistence between renewable energy and stable sources of electric power such as gas, coal-fired power, and nuclear power.

For example, we also deal in hydrogen mixed-fuel combustion power generation, which has a low environmental impact. MHI Group is aiming to conduct hydrogen mono-fuel combustion power generation that does not emit CO₂ in the future, and will drive the construction of an energy supply chain by com-

binning its diverse technologies.

Additionally, we are able to offer environmentally friendly solutions in existing power generation fields, such as coal-fired generation systems equipped with IGCC—which generates power with a low environmental impact by extracting gas from coal—and with technology that recovers about 90% of CO₂ emissions.

MHI Group will propose an electricity supply system that fits societal needs and fulfills the basic requirements of 3E+S (economy, energy security, and environmental protection and safety), as outlined in Japan's Strategic Energy Plan.

2018 Medium-Term Business Plan: Growth Strategies

Throughout the duration of the 2018 Medium-Term Business Plan, we will steadily execute ongoing projects involving our abundant gas and steam power systems and endeavor to secure profit. At the same time, we will promote the growth strategies below, which were formulated in anticipation of the 2021 Medium-Term Business Plan.

We will work to improve profitability by establishing new gas and steam power systems, performing revamp work on existing power generation facilities to reduce carbon emissions and enhance efficiency, and expand the service business by making use of leading-edge digital technologies.

In the nuclear power business, we will focus on the safe and reliable construction of facilities that are compliant with new Japanese safety criteria and that can handle specific large accidents. After restarting facility operations, we will engage in all varieties of maintenance. Furthermore, we will continue to provide support for the Fukushima Daiichi Nuclear Power Station of Tokyo Electric Power Company Holdings, Inc.

In terms of aero engines, we will strive to expand resources in order to respond to robust demand for commercial aircraft and focus on our engine over-

haul and parts repair business.

MHI is also aiming to strengthen its competitiveness in renewable energy. To this end, we will respond to an expanding offshore wind power market by bolstering our system of mass production and by releasing an offshore wind power generation device with a higher output than any other. Furthermore, we will propose solutions that raise added value through a combination of flexible power sources (small size gas turbines, etc.) and energy storage (storage batteries, power to fuel, etc.).

In the compressors business, we will secure orders for petrochemical plants, which has been an area of strength for us. In addition, we will demonstrate our turbomachinery synergies and strive to expand our business into the upstream oil and gas market with the support of technologies such as our gas turbine-driven LNG compressor train, which combines compressors with small- to medium-size gas turbines.

Furthermore, MHI will work to open up new fields of business through its power and energy solution business, which incorporates an integrated management system that utilizes AI and IoT technologies such as MHPS-TOMONI® and ENERGY CLOUD®.

Activities Focused on the 2018 Medium-Term Business Plan and Beyond

OUR GOALS

Technology that contributes to the achievement of low-carbon and carbon-free societies

Evolution of core technologies and commercial machinery

Improvement of existing power generation systems

(Safety improvements in high-efficiency and large-capacity GTCC, hydrogen, ammonia, and methane-fueled gas turbines and light-water reactor plants)

Renewable energy power generation

(Wind, geothermal, hydroelectric, and organic Rankine cycle)

Turbomachinery synergies

Efficient business expansion through mutual use of turbine technology, human resources, and facilities

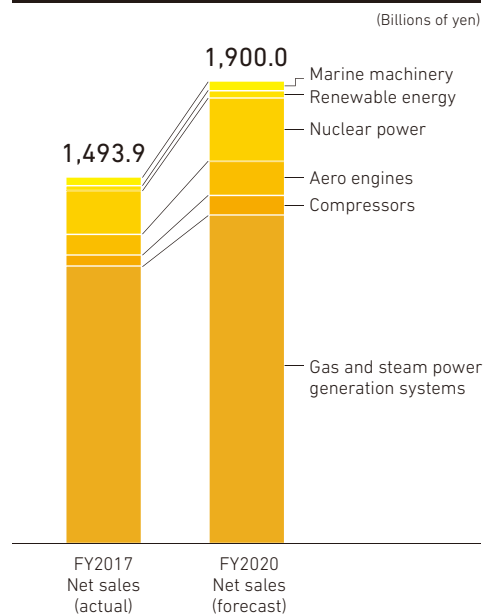
(Turbine products such as our gas turbines, aero engines, aero-derivative gas turbines, compressors, pumps, MET turbochargers, and organic Rankine cycle)

Measures Aimed at Achieving Goals in the 2018 Medium-Term Business Plan

Gas and steam power generation systems	<ul style="list-style-type: none"> Improvement in profitability through efficient construction in ongoing projects Expansion of the service business (modification to existing facilities aimed at reducing carbon emissions and improving efficiency, digitalization, and O&M* optimization, etc.) Improvement in operating efficiency with continued implementation of PMI
Nuclear power	<ul style="list-style-type: none"> Response to new Japanese safety criteria and promotion of safe and reliable construction of facilities that can handle specific large accidents Implementation of maintenance after restarting facility operations Support for the completed construction of nuclear fuel cycle facilities Support for stabilization of the Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Station Strengthening of risk management for participation in overseas projects
Aero engines	<ul style="list-style-type: none"> Expansion of business scale in response to robust demand for commercial aircraft Expansion of engine overhaul and parts repair business
Renewable energy	<ul style="list-style-type: none"> Strengthening of competitive power in response to an expanding offshore wind power market
Others (compressors, turbomachinery synergies, power and energy solution business, etc.)	<ul style="list-style-type: none"> Creation of new compressor facilities and enhancement of service facilities as the oil and gas market environment recovers Business creation and demonstration of synergies of our wide-ranging turbomachinery technologies Opening of new business fields through the power and energy solution business

*O&M: Operation and Maintenance

Breakdown of Sales Plan



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As a Member of the Local Community

Mitsubishi Hitachi Power Systems Americas, Inc. (MHPS Americas), a power business company in the Americas, invites multiple local high school and college student groups every year to its Orlando Service Center. Through this opportunity, the students learn how power plants work, and how natural gas turbines are manufactured and repaired. MHPS Americas aims to promote science, technology, engineering and mathematics (STEM) and manufacturing careers.



Integrated management that utilizes AI and IoT technologies

Power and energy solutions

Services for power generating stations

(Flexible operation, performance improvement, and O&M optimization)



Services for customers

(Support for energy infrastructure, O&M support, EMS* and utility optimization systems, and maintenance support)



*EMS: Energy Maintenance System