Providing optimal solutions toward the creation of improvement of social infrastructure in the energy and environmental areas

Energy & Environment

Energy & Environment provides optimal solutions in social infrastructure in the areas of energy—including thermal, nuclear, and renewable energies—and the environment, such as water and flue gas treatment, and chemical plants. MHI also combines its engineering, procurement, and construction (EPC) capabilities relating to the domain's various businesses and products to provide optimal solutions.

By pursuing the MHI Group's diverse product and operational strengths and synergies, we will strive to win out in global competition by responding to customer and market needs.

Atsushi Maekawa
Domain CEO,
Energy & Environment

Fiscal 2013 in Review

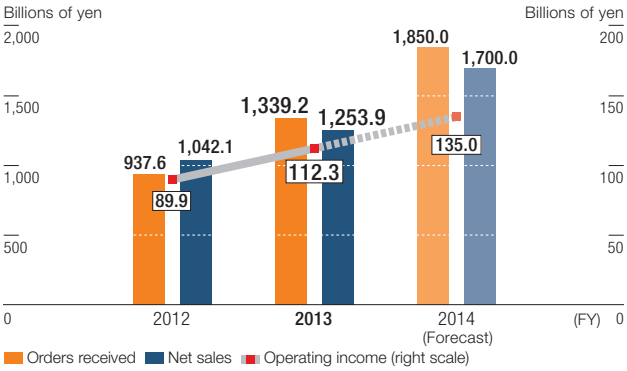
During fiscal 2013, MHI received orders for chemical plants in Russia and the United States, and orders for large-scale gas turbines totaled 18, up from eight in the previous fiscal year. Benefiting from the rise in large overseas projects, centering on thermal power and chemical plants, orders received amounted to ¥1,339.2 billion, significantly higher than in the previous fiscal year.

In addition to the integration of the thermal power generation businesses of MHI and Hitachi, Ltd., higher sales of thermal power and chemical plants helped push up consolidated net sales in this domain to ¥1,253.9 billion. Operating income was also up year on year, to ¥112.3 billion, due primarily to higher sales of gas turbine combined-cycle (GTCC) and chemical plants and the effects of yen depreciation.

Operating Environment

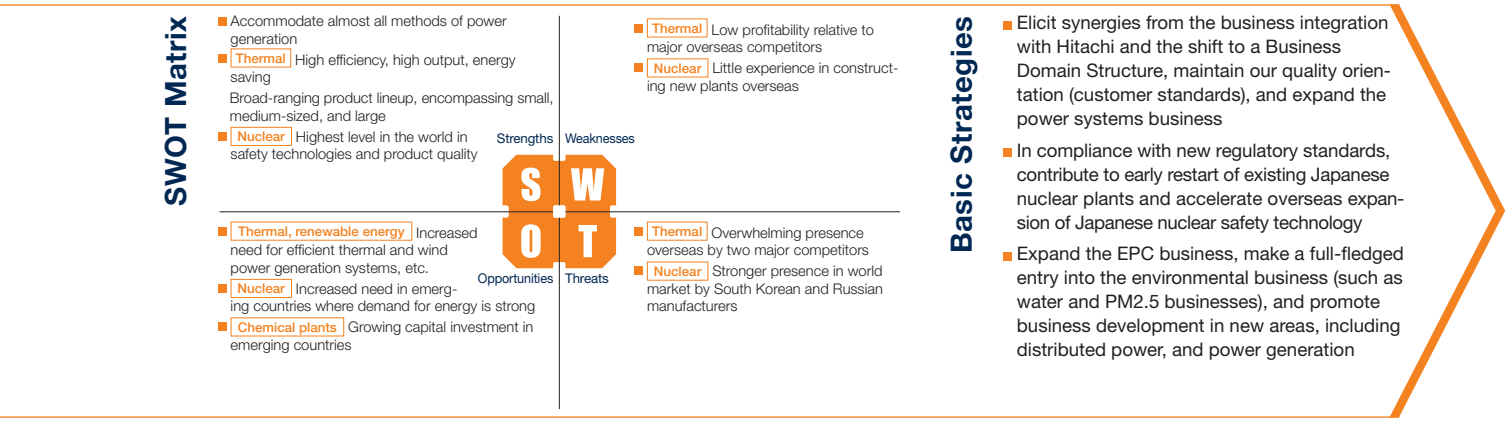
Energy demand continues to grow on a global scale; by 2035, demand is forecast to be 1.3 times the current level.* In thermal generation, given that the shale gas revolution is driving down

Orders Received / Net Sales / Operating Income



Strategic Business Unit (SBU)

- GTCC
- Large Conventional Plant & Service
- Industrial Conventional Plant & Service
- Onshore Wind Turbine
- Offshore Wind Turbine
- Photovoltaic Power System
- Marine Diesel Engine
- Marine Machinery
- Pump & Hydro Turbine
- Power Generation Project Development
- Nuclear Turbines
- New Products
  - Desalination Plant
  - Geothermal Power Plant
  - SOFC
  - Lithium-ion Battery
- Nuclear Power Plant (Domestic)
- Nuclear Power Plant (Global)
- Nuclear Fuel Cycle & Advanced Solutions
- Chemical Plant
- Environmental Plant



natural gas prices, GTCC demand is expected to stay strong going forward. We expect coal-fired thermal power demand to remain robust, owing to demand to upgrade aging facilities and build new generating plants in emerging countries. At the same time, as CO_2 emissions from power generation account for 41.7% of the global total,* pressure for global warming countermeasures is growing. Under these circumstances, we are seeing growing demand and expectations for nuclear power generation and renewable energy, as well as for thermal power generation that is highly efficient and curtails CO_2 emissions.

The new construction of chemical plants is growing in North America, where shale gas development is pushing ahead, and in such gas-resource-rich areas as Russia and Africa.

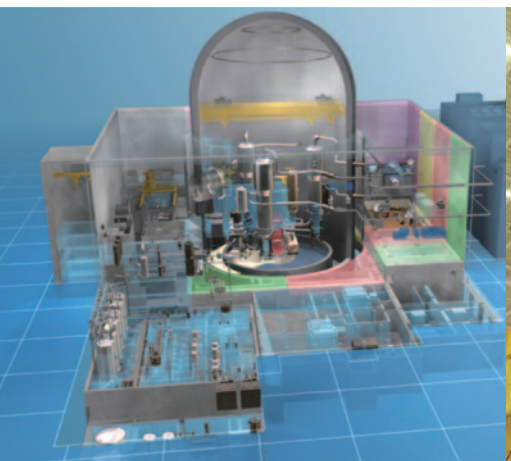
* Source: *CO_2 Emissions from Fuel Combustion Highlights 2013*, International Energy Agency

Initiatives for Growth over the Medium to Long Term

Maintaining a core quality orientation, by investing aggressively in growth fields and bolstering cost competitiveness we aim to boost orders by around 1.5 times and approximately double operating income. In the field of thermal power generation, at Mitsubishi Hitachi Power Systems, Ltd. (MHPS), which was established through the integration of businesses from Hitachi and MHI, we expect to accelerate the combination of technological capabilities. On the development front, we will hone our competitive edge by pursuing additional generation efficiencies, while taking advantage of our larger combined network to reinforce EPC and after-sales services. Through the new joint venture we have established with Vestas Wind Systems A/S, we will strive to develop the offshore wind turbine business on a global scale. As part of this business, MHI is promoting developments designed to reduce environmental impact by entering the water, distributed power source, and power generation businesses. As we continue to view nuclear power as a key source of generation, we will work to improve nuclear power safety and develop advanced technologies. Furthermore, we will maintain an ongoing focus on the chemical plant business, for which the market is expanding.

Key Projects

Announcement	Delivery	Project
June 2014	2017	MHI Receives Order for Large-Scale Polyethylene Plant Project in the United States
June 2014	2016	MHPS Signs Agreement with Daewoo Engineering & Construction Co., Ltd., of South Korea to Supply Core Components for GTCC Power Generation Plant
May 2014	2016	MHPS Receives Order for GTCC Power Generation Plant from Kyushu Electric Power Co. Inc.
April 2014	–	Operations Get Under Way at MHI Vestas Offshore Wind A/S, New Joint-Venture Company Dedicated to Offshore Wind Turbine Business
March 2014	2016	MHI and Turkish Company Sign Partnership Agreement in Natural Gas Fired Power Generation Business
February 2014	–	Mitsubishi Hitachi Power Systems Commences Operations
October 2013	–	Broad Framework Reached with Government of Turkey on Commercial Agreement Relating to Nuclear Power Plant Project
October 2013	–	Launch of Mitsubishi Heavy Industries Marine Machinery & Engine Co., Ltd.



FOCUS **Energy & Environment**

Aiming to Be a World Leader in Thermal Power Generation Systems

Rising energy demand across the world is causing the global market for thermal power generation systems to expand. However, competition in this area is fierce, pitting us against some of world's largest companies—the so-called mega-players. Leveraging our strength in power generation technologies that have a low environmental impact to win out in global competition, on February 1, 2014, MHI formed Mitsubishi Hitachi Power Systems, Ltd., integrating our business in thermal power generation systems with that of Hitachi, Ltd.

Backdrop

- **Growing demand for thermal power generation systems that have low environmental impact**
- **Increasingly severe competition with megaplayers from Europe and the United States**

In emerging countries experiencing rapid economic expansion, particularly those in Asia, rising energy consumption is leading to growing demand for the new construction of power generation systems and the replacement of aging equipment. This trend is expected to remain consistent over the medium to long term. The market for thermal power generation is expanding due to the shale gas revolution, which is boosting supplies of natural gas, as well as to abundant reserves of coal used for fuel. Meanwhile, increasing concerns about global warming are sharpening the focus on power generation systems that feature reduced environmental impact.

Technological expertise and cost competitiveness are keys to the market for thermal power generation systems. Due to the extremely high burden of investment in such systems, companies that operate on a large scale and can harness the benefits of mass production are at a clear advantage. For this reason, the major European and U.S. companies in this field—the so-called megaplayers—enjoy an overwhelming presence. For MHI, which is now turning its strategic focus to the global market, winning out against this formidable competition will be a challenge.

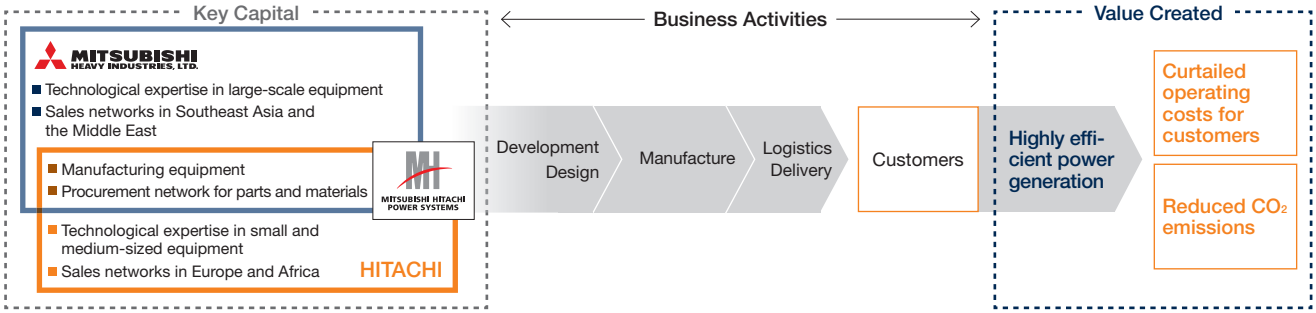
Key Capital

- **Strong business partners with complementary relationships**
- **Technologies for the manufacturing of thermal power equipment with the world's highest level of environmental performance**

As a far-reaching measure to face increasingly severe global competition, we resolved to undergo a business integration with Hitachi, our former rival in Japan. Over the years, our companies had pursued partnerships in a variety of fields, including iron and steel manufacturing machinery. This combination in thermal power generation systems was ideal in many ways, as Hitachi and MHI complement each other in terms of geographical location of operations and product categories. Regionally, MHI has strengths mainly in Southeast Asia and the Middle East, with sales routes in China and the United States, while Hitachi has harnessed its strengths in markets such as Europe and Africa. In gas turbines, central components for thermal power generation, MHI's forte is in large-scale equipment, whereas Hitachi excels at small and medium-sized equipment.

MHI's gas turbine combined-cycle (GTCC) generation systems, which have J-Series gas turbines at their core, achieve the world's highest level of environmental performance within the field of thermal power generation. Accordingly, we are well placed to meet demand for reduced environmental impact.

In use at Japan's first integrated coal gasification combined-cycle (IGCC) plant, the Nakoso power plant of Joban Joint Power Co., Ltd., in Fukushima Prefecture



Strategy

- Elicit synergies stemming from complementary strengths in product lineups and geographic regions
- Differentiate ourselves by proactively deploying EPC expertise

Striving to become a global leader in thermal power generation systems and contributing our utmost to global warming prevention

Mitsubishi Hitachi Power Systems, which aims to become a global leader in the area of thermal power generation systems, commenced operations on February 1, 2014, with MHI and Hitachi taking equity interests of 65% and 35%, respectively. Geographically, the joint venture covers the entire world and has in place systems to meet needs for both the new construction of generation systems and the provision of after-sales services. This integration of two companies with strengths in different product areas results in a full lineup and the ability to meet a host of needs throughout the world. One of MHI's particular strengths, its large GTCC systems, combine the superb generation efficiency of J-Series gas turbines with steam turbines that utilize the high-temperature exhaust gas from the gas turbine to generate electricity. With J-Series gas turbines, GTCC power generation enables reductions in CO_2 emissions of approximately 50% compared with conventional coal-fired generation plants, making a substantial contribution toward reducing the global environmental impact. Accordingly, we anticipate a strong customer response to GTCC systems fitted with J-Series gas turbines from countries and regions where environmental awareness is mounting. We have also introduced integrated coal gasification combined cycle (IGCC) power generation technology to generate electricity with steam turbines powered by the incineration of gasified coal. Compared with conventional generation methods, this approach improves generation efficiency by 10% to 20%,* curtailing greenhouse gas emissions despite the use of coal. The small and medium-sized gas turbines that are Hitachi's forte also offer superb environmental performance, contributing to the new company's broad range of technological expertise.

By proactively deploying engineering, procurement, and construction (EPC) expertise across all plants, we aim to differentiate ourselves from the megaplayers with an integrated offering they are unable to match. The broad range of products and services that MHI and Hitachi have developed in their respective thermal power generation system businesses, coupled with the expertise MHI has accumulated in its engineering business, will enable the new company to go beyond products to offer total solutions that encompass entire systems.

Based on this strategy, at the time of the company's establishment its scale of business was around ¥1,240.0 billion per year. In fiscal 2014, the business is expected to generate revenues of ¥1,300 billion, rising to ¥2 trillion by fiscal 2020. We also expect the company's share of the market for large-scale gas turbines to grow eventually from more than 10% as of February 2014 to in excess of 30%. To survive in the face of stringent competition, we will provide our highly efficient thermal power generation systems that offer superb environmental performance on a global scale, thereby helping to resolve worldwide issues, including energy shortages and global warming.

* Based on MHI's research

VOICE

Ataporn Vathanavisuth

Assistant Governor, Business Administration, Operation and Maintenance Business Management Division, Electricity Generating Authority of Thailand

It has been more than 45 years since MHI and EGAT began their relationship through the construction, operation, and maintenance of hydro, conventional, and GTCC power plants, and such long-term relationship has made MHI and EGAT "strategic business partners" rather than just a "supplier" and "owner." This partnership has resulted in successful collaborative businesses, such as the completion of the Joint Gas Turbine Relocation Project, the establishment and operation of the Joint Gas Turbine Repair Factory, among other ventures, and the business areas of the collaborations between MHI and EGAT have been expanded to overseas locations beyond Thailand.

In addition, EGAT has further expectations for Mitsubishi Hitachi Power Systems (MHPS), with a wide variety in its service lineup, reliable technologies, and warm support, based on the synergetic effect after the integration of the thermal power generation systems business of MHI and Hitachi during the year. Actually, MHPS and EGAT have already started strategic discussions in order to create a new collaborative business drawing on Hitachi's technologies as well as MHI's technologies. EGAT believes that it will further contribute to the enhancement of the relationship between MHPS and EGAT and to provide reliable and affordable energy and services for the happiness of people, societies, and environments in ASEAN countries, which is one of EGAT's missions.

We hope that MHPS keeps providing its Japanese style of warm, timely, and careful support based on "*CS-First!*" (Customer Satisfaction First!)—the mission of the MHPS Service Division—and to continuously be EGAT's "Best Friend Partner."